Adoption of Part 21

Certification Procedures for Products and Parts

Adopted: October 14, 1964 Effective: February 1, 1965

(Published in 29 F.R. 14562, October 24, 1964)

This amendment adds Part 21 [New] to the Federal Aviation Regulations to replace the procedural rules governing the certification of products and parts as presently set forth in Parts 1, 3, 4b, 5, 6, 7, 8, 9, 9a, 10, 13, 14, and 410 and in Special Civil Air Regulations 422B and 425C. This amendment is part of the recodification program announced in Draft Release 61-25 published in the Federal Register on November 15, 1961 (26 F.R. 10698).

Part 21 **[**New**]** was published as a notice of proposed rule making in the Federal Register on May 27, 1964 (29 F.R. 6999), and given further distribution as Notice No. 64-31.

Many of the comments received recommended specific substantive changes to the regulations. Although many of the recommendations appear to be meritorious, they cannot be adopted as a Part of the recodification program. The purpose of the program is simply to streamline and clarify present regulatory language and delete obsolete or redundant provisions. To attempt substantive changes, other than relaxatory ones that are completely noncontroversial, would delay the project and be contrary to the ground rules specified for it in Draft Release 61-25. However, all substantive comments received will be retained and will be given careful consideration in future regulatory projects.

As was stated in the preamble of the notice of proposed rule making of Part 21**[**New**]**, those definitions in present Part 1 (and not now in Part 1 **[**New**]** or executed in this Part) that are necessary, will be recodified with the definitions of other airworthiness Parts and added to Part 1**[**New**]**.

One of the comments received questioned the omission as surplusage of the .12 and .18 sections of CAR Parts 3, 4b, 5, 6, 7, 13, and 14 in the notice of proposed rule making. The .12 sections contained a direction to the Administrator to record in the type certificate the applicable regulations with which an applicant has shown compliance. This direction to the Administrator was a vestige of rules promulgated by the Civil Aeronautics Board and directed to the Administrator of the Civil Aeronautics Administration. Because of the consolidation of rule making authority in the Federal Aviation Agency, they are no longer necessary in the Federal Aviation Regulations. Section 21.41 indicates clearly that the type certificate is considered to include "the applicable regulations of this subchapter with which the Administrator records compliance".

The .18 sections generally related to the approval of materials, parts, processes, and appliances "upon a basis and in a manner found necessary by the Administrator to implement the pertinent provision of the regulations in this subchapter". Paragraph (a) of this section also is no longer necessary for the reason set for the in the preceding paragraph. Paragraph (b) is covered by Section 37.1 of Part 37 "Technical Standard Order Authorizations"**[**New**]**. However, the note to the .18 sections is being retained as Section 21.305 so that it is clear that there are three possible ways in which a material, part, process, or appliance may satisfy "approval" requirements.

A new Section 21.307 has been added to reflect CAR Sections 10.21 and 10.31. Those sections provided for the approval of materials, parts, and appliances manufactured in a foreign country upon certification by that country that the material, part, or appliance conforms to the applicable specifications adopted by the Administrator.

The distribution table for the notice indicated that CAR Section 1.74(b) would be transferred to Part 91**[**New**]**. This paragraph was another direction to the Administrator of the Civil Aeronautics Administration by the Civil Aeronautics Board and is no longer necessary for the reasons stated previously. The prohibition against carrying passengers for compensation or hire in experimentally certificated aircraft is an operating limitation issued by the Agency and the omission of this provision does not result in any substantive change since, under Section 91.31, no person may operate an aircraft contrary to its operating limitations.

The provisions of CAM Section 1.77-4 have been transferred to Part 91 **[**New**]** rather than to the air carrier operating rules, as indicated in the notice, since operations under these provisions are not in air transportation.

The definition of "product" in Section 21.1(e) has been broadened to include "propellers" as did the definition of that term in CAR Part 1. In addition, the term "appliances" has been deleted from this definition since the CAR Part 1 definition included only "appliances ... eligible for a type certificate". No appliances are presently eligible for a type certificate.

The provisions relating to "production under a type certificate only" that were contained in Sections 21.53(a) and 21.55 through 21.65 of the notice have been transferred from Subpart B to a separate Subpart F. These sections do not relate to the issue of a type certificate and it is more appropriate that they be in a separate subpart immediately preceding the subpart on "production certificates".

Proposed Section 21.63 (Section 21.128) has been rewritten to reflect the accepted interpretation of present CAM Section 1.15-4(e) throughout the Agency and the industry. This change

conforms to the existing practice of defining the production acceptance test in terms of the maximum continuous rating and the takeoff rating.

Section 21.181 has been rewritten to make it clear that an airworthiness certificate for a particular aircraft is effective only as long as the aircraft is registered in the United States. This change is not substantive, but merely clarifying in nature, since it is a statement of existing law under the Federal Aviation Act.

Section 21.189 has been rewritten to include the statement presently contained in CAR Section 1.71 and 9.3 indicating that after June 30, 1965, no limited category airworthiness certificates will be issued unless the aircraft was previously issued an airworthiness certificate in the category. In addition, the prohibition against operating a limited category aircraft carrying persons for compensation or hire has been transferred from Section 21.189 to Section 91.40 since it is more appropriate in Part 91.

Section 21.197(a)(1) has been rewritten to include the performance of "maintenance" as one of the purposes for which a special flight permit may be issued. Since special flight permits have traditionally been issued for the purpose of performing maintenance and since any change that is being made is relaxatory this may be done as part of the recodification project.

Sections 21.15 and 21.47 have been changed to reflect the amendment proposed in Notice 64-7 issued February 5, 1964 (29 F.R. 2349). As amended, Section 21.15 states that an application for a type certificate should be submitted to the appropriate FAA regional office. Section 21.47 incorporates the proposed amendment to CAR Section 1.14 requiring the grantor of a type certificate to notify the appropriate FAA regional office within 30 days after the transaction, specifying the date of transfer, and requiring a similar notice after the termination of a licensing agreement. The Agency did not receive any adverse comments to Notice No. 64-7 and therefore these amendments are incorporated in Part 21**[**New**]**.

Section 21.77 has been amended to change the duration of a Class II provisional type certificate from "six months after the date of issue, or 60 days after the corresponding type certificate is issued whichever is first" to "twelve months after the date of issue". Section 21.77 is based on Section 4 of Special Civil Air Regulation 425C. The Agency has found that in many case the 60-day period after the issue of the type certificate is inadequate for an aircraft manufacturer to effect modifications of the provisionally certificated aircraft for conformance with the type design. By extending the duration period to twelve months the Agency believes that adequate time will be provided for any modifications necessary to conform to the type design. Since this amendment is noncontroversial and

imposes no additional burden on any person it may be made without compliance with the notice and public procedure provisions of the Administrative Procedure Act.

As the preamble to Part 31 **[**New**]** stated, (29 F.R. 8256) Subpart G-"Certification Procedures" of that Part is deleted since the provisions of Part 21 **[**New**]** are applicable to manned free balloons.

Other minor changes of a technical nature have been made. They are not substantive and do not impose any burden on regulated persons.

This amendment deletes CAR Parts 1, 5, 8, 9, 9a, 10, 13, 14, and 410 and certain sections of SR 425C. The procedural requirements of Parts 3, 4b, 6, and 7 will be deleted by the separate amendments recodifying the airworthiness requirements of those Parts. Those amendments will be made effective on the same date as this amendment.

Interested persons have been afforded an opportunity to participate in the making of this regulation, and due consideration has been given to all relevant matter presented. The Agency wishes to thank those persons who submitted comments for the cooperative spirit in which those comments were submitted.

In consideration of the foregoing Chapters I and III of Title 14 of the Code of Federal Regulations are amended as hereinafter set forth effective February 1, 1965.

A Part 21 **[**New**]** reading as follows is added.

This amendment is made under the authority of Sections 311, 313(a), 314, 601, 603, 607, 608, 609, and 1102 of the Federal Aviation Act of 1958 (49 U.S.C. 1352, 1354(a), 1355, 1421, 1423, 1427, 1428, 1429, and 1502).

Amendment 21-1

Effectiveness of Airworthiness Certificates

Adopted: June 17, 1965 Effective: September 21, 1965

(Published in 30 F.R. 8032, June 23, 1965)

The purpose of this amendment is to clarify the regulation governing the duration of airworthiness certificates with respect to the performance of alterations. In addition, the details of the revision to the format of airworthiness certificates as specified in the Notice on this matter are set forth herein. This action is based on the proposal published in the Federal

Register (27 F.R. 12720) and issued as Draft Release 62-55.

While Draft Release 62-55 proposed to amend sections of Parts 1 and 43 of the Civil Air Regulations, these regulations have subsequently been recodified as Parts 21 and 91 respectively, of the Federal Aviation Regulations. These amendments are therefore made to the appropriate sections of the recodified parts.

As proposed in the Draft Release, section 21.181(a) (formerly section 1.64) is amended to make it clear that an airworthiness certificate remains in effect as long as alternations, as well as maintenance, are performed in accordance with Parts 43 and 91 of the Federal Aviation Regulations. In addition, section 91.163 (formerly section 43.20) is amended to include alterations within the prohibition provided therein. In connection with these amendments, there were comments suggesting that the regulations should make it clear that alterations must also be "accomplished in accordance with the pertinent portions of the applicable airworthiness requirements..." As amended, the regulations now require that alterations be accomplished in accordance with Part 43, which in turn requires that alterations be performed on the basis of approved technical data and that after alteration the aircraft, airframe, aircraft engine, propeller or appliance worked on must be at least equal to its original or properly altered condition. Thus, under the current provisions of Part 43 the applicable airworthiness requirements must be considered during the performance of alterations. For this reason, the Agency does not believe that a general reference to the applicable airworthiness requirement as suggested is necessary or would serve any useful purpose.

At the time that the Draft Release was issued, the term "maintenance" included preventive maintenance. However, as now

defined, maintenance does not include preventive maintenance. Therefore to make these regulations consistent with the proposal, sections 21.181(a) and 91.163 are amended to specifically include preventive maintenance.

In addition to the foregoing, the proposal would have amended the regulation governing the duration of airworthiness certificates to require that an aircraft be in a condition for safe operation in addition to requiring that maintenance and alterations on the aircraft be performed in accordance with Parts 43 and 91 of the Federal Aviation Regulations. However, since the requirement for the performance of maintenance and alterations in accordance with Parts 43 and 91 is designed to assure that the aircraft is in a condition for safe operation, the proposed amendment appears to be unnecessary and could be misleading. For these reasons, the regulation has not been changed as proposed.

Certain other clarifying changes proposed in Draft Release

62-55 have subsequently been incorporated into the regulations. In this connection, during the recodification program a clarification was incorporated into section 21.181(a) specifying that an airworthiness certificate is effective as long as the aircraft for which it is issued is registered in the United States. Moreover, section 91.27(a) was recently amended to provide the clarification concerning special flight permits which was proposed in Draft Release 62-55.

Draft Release 62-55 proposed that the regulations (formerly section 43.20) be amended to require that an aircraft be inspected and found to be in a condition for safe operation whenever the approved operating limitations for the aircraft had been exceeded. The comments received concerning this proposal pointed out the problems involved in establishing compliance with this requirement, indicating that it was unworkable and subject to many interpretations. On the other hand, as recodified, the regulations now expressly provide that the pilot in command is responsible for determining whether his aircraft is in condition for safe flight and require him to discontinue the flight when unairworthy mechanical or structural conditions occur. In view of the foregoing the proposed requirement is not being adopted.

The Draft release referred to the Agency's plans to revise the format of airworthiness certificates. In this connection, as proposed, the new format will reflect the amendments set forth herein and will provide for the enumeration of any exceptions to full compliance with the applicable comprehensive and detailed national airworthiness requirements in accordance with the Convention on International Civil Aviation (ICAO). It was proposed to add an explanatory NOTE to the regulations to the effect that the airworthiness certificate would identify any exemptions from the applicable airworthiness requirements that had been granted for an aircraft. However, the Agency does not now consider that such a NOTE is necessary or appropriate. Moreover, it has subsequently been determined by the Agency that at this time the revised airworthiness certificate need only be issued for aircraft certificated in the normal, utility, acrobatic, and transport category. In addition, it should be emphasized that this amendment does not require the exchange of present certificates. Certificates in the new format will simply be issued in the future to persons applying for airworthiness certification.

There was also a general comment made with respect to the need for definitions of the terms "airworthy" and "airworthiness" in the regulations. While the Agency is aware of the problems referred to in this comment, the recommended action goes beyond the scope of the Notice in this matter.

Interested persons have been afforded an opportunity to participate in the making of this amendment and due consideration has been given to all relevant matters presented.

These amendments are issued under the authority of sections

313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, 1423).

In consideration of the foregoing, Parts 21 and 91 of the Federal Aviation Regulations are amended effective September 21, 1965, as follows.

Amendment 21-2

Export Airworthiness Approval Procedures

Adopted: June 24, 1965 Effective: August 30, 1965

(Published in 30 F.R. 8464, July 2, 1965)

The purpose of this amendment is to prescribe the regulations and procedures applicable to the issuance of export certificates of airworthiness and other export airworthiness approvals. This action was published as a notice of proposed rule making and circulated as Federal Aviation Agency Notice No. 63-15 (28 F.R. 3728). It was proposed to amend Part 1 of the Civil Air Regulations. However, Part 1 has been recodified as Part 21 of the Federal Aviation Regulations and this rule is issued in its recodified form as an amendment to Part 21.

Section 1102 of the Federal Aviation Act of 1958 requires the Administrator to exercise and perform his powers and duties under the Act consistent with any obligation assumed by the United States in any treaty, convention, or agreement that may be in force between the United States and any foreign country or countries.

The United States has concluded reciprocal agreements with a number of foreign countries governing the import and export of aeronautical products. These agreements provide for the mutual validation or acceptance of export certificates of airworthiness issued for aeronautical products which are manufactured in and meet the airworthiness requirements of the county of export and any special requirements of the importing country.

The export airworthiness approval procedures set forth in the regulation implement the reciprocal agreements and, for the most part, are the same as the procedures previously published by the FAA in a Manual of Procedures. An export airworthiness approval issued by the FAA is not to be confused with nor does it take the place of an export license which is required and issued by the United States Department of Commerce or the United States Department of State. Furthermore, an export certificate of airworthiness is not an airworthiness certificate under the Act, and does not authorize the operation of aircraft for which it is issued.

Numerous comments have been received in response to the

notice of proposed rule making and changes have been made in the regulation in the light of such comments. One of the comments

received in response to Notice 63-15 questioned the need for the regulation, suggesting that an overhaul of the former Manual of Procedures would be adequate. The export airworthiness approval procedures set forth in this regulation, as well as in the former Manual of Procedures, are designed to implement the reciprocal agreements between the United States and various foreign countries. Therefore, compliance with such requirements is necessary in order to obtain an export airworthiness approval from the FAA. As indicated in the preamble to Notice 63-15, publication of this regulation is necessary in order to provide the public with the current requirements concerning export airworthiness approvals.

Another comment objected to the proposed inclusion of the special requirements of the various foreign countries in an Appendix to the regulation. It was stated that such inclusion would make the special requirements mandatory with respect to the aircraft manufacturers. The FAA has decided to set forth the special requirements of the foreign countries as well as other necessary information concerning this regulation in an Advisory Circular rather than an Appendix. However, it should be pointed out that the special requirements of the various foreign countries are a part of the reciprocal agreements between the United States and such foreign countries and as such are mandatory requirements for the issuance of airworthiness approvals by the FAA regardless of whether or not they are set forth in an Appendix.

A comment was also received which suggested that the Export Certificate of Airworthiness should constitute an airworthiness certificate so that the aircraft could be operated for training purposes and for the purpose of ferrying the aircraft. However, many of the aircraft for which an export certificate of airworthiness is requested are aircraft which have been sold to a foreign purchaser and the title to the aircraft has passed to such purchaser. Such aircraft are not eligible for U.S. airworthiness certificates and if the suggestion were incorporated into this regulation, these aircraft would not be eligible for Export Certificates of Airworthiness. This would defeat the purpose of the regulation.

There was an objection to the proposed time limit on the duration of Special Export Airworthiness Approvals on the grounds that 60 days does not allow sufficient time in which to complete most sales transactions. It was recommended that there be no time limit established for such approvals. Upon further consideration, the Agency agrees that a specific time limit should not be necessary in the light of the other provisions of

this regulation and the 60-day time limit has been deleted with respect to Special Export Airworthiness Approvals.

This regulation requires an applicant for an export certificate of airworthiness for a Class I product to show that the product meets certain specified requirements. However, as proposed, one of the requirements specifically provided that the required showing be made at the time the application for the certificate is made. This was considered appropriate even though a showing of compliance with such requirement would obviously require that the product be submitted for examination by the Agency, because it was thought that the filing of the application and the presentation of the product for export approval would occur at the same time. However, the Agency is now aware that there may be instances involving a substantial period of time between the filing of the application and the presentation of the product for examination by the Agency. Therefore the proposal has been revised to make it clear that the required showing of compliance by the applicant for the export approval of a Class I product must, in all cases, be made at the time the product is submitted to the Administrator for such export approval.

With respect to the requirement that used engines and propellers must be newly overhauled in order to be covered by an FAA export approval, it was recommended that such products should be issued export approval without having to be newly overhauled if they were in a serviceable condition. The Agency sees some merit in this recommendation and the proposal has been relaxed with respect to used engines and propellers that are being exported as a part of a certificated aircraft. As now written, such engines and propellers are required to have been overhauled within the last 500 hours' time in service, the overhaul period recommended by the manufacturer, or the overhaul period established by the Administrator, whichever is the shortest. Used engines and propellers not being exported as part of a certificated aircraft must still be newly overhauled. In addition, the term "newly overhauled" has been clarified in line with industry's suggestion. As now defined, the term means that the product has not been operated, except for tests, since overhaul.

In connection with the performance of the periodic inspections and overhauls required by this regulation, the proposal stated that such inspections and overhauls must be performed and approved by, among others, certificated air carriers possessing adequate overhaul facilities and having a maintenance organization appropriate to the product involved. However, under the current provisions of Part 43 and Parts 121

and 127, an air carrier is authorized only to perform and approve maintenance, preventive maintenance, and alterations as provided for in its continuous airworthiness maintenance program and its maintenance manual and to perform these functions for another air carrier as provided in the continuous airworthiness maintenance program and the maintenance manual of the other air carrier. Therefore, in view of the foregoing limitations on the authority of air carriers to perform and approve periodic inspections and overhauls, the proposal requiring that such inspections and

alterations be performed by air carriers has been deleted. It should be noted, however, that this deletion does not affect air carriers who also hold repair station certificates.

There was also some opposition to the requirement that copies of manufacturers' service bulletins must be furnished with each application for export approval of a Class I product. It was pointed out that this requirement is too broad and is unnecessary since, in the past, the practice has been to provide only a listing of the AD status of the aircraft. The Agency agrees that to require the manufacturer to furnish all the service bulletins applicable to a Class I product is not necessary and that the required information is that related to the airworthiness directives. Therefore, the regulation has been revised to specifically provide that the applicant for export approval need only furnish evidence of compliance with the applicable airworthiness directive.

It was also suggested that an exporter should not be required to forward all the historical records pertaining to the aircraft through governmental channels. It was stated that certain documents must be shipped with the aircraft so that they will be available for certification of the aircraft in a foreign country. The FAA did not intend to require that the historical documents be shipped separately from the product to which they apply. The regulation has, therefore, been clarified to permit the exporter to forward the documents by any means which he considers appropriate so long as such means is consistent with the special requirements of the importing country.

In addition to the foregoing, the proposal has been changed to provide for the issue of export approval for Class III products. Under the proposal, Class III products were not eligible for export approval because of the nature of such products. However, it has subsequently been determined that certain Class III products should be eligible for airworthiness approval. Therefore, the regulation has been revised to permit manufacturers holding production approval and employing persons authorized by the Administrator to issue Class III approvals, to

obtain such approvals.

Interested persons have been afforded an opportunity to participate in the making of this regulation, and due consideration has been given to all relevant matter presented.

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended effective August 30, 1965, as follows.

This amendment is made under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958; (49 U.S.C. 1354, 1421, and 1423).

Amendment 21-3

Adopted: July 7, 1965 Effective: August 13, 1965

(Published in 30 F.R. 8826, July 14, 1965)

The purpose of this amendment to Parts 21 and 39 of the Federal Aviation Regulations is to remove certain procedural restrictions heretofore imposed on the FAA with regard to the issue of airworthiness directives (ADs). This action was published as a Notice of Proposed Rule Making (29 F.R. 6446) and circulated as Notice 64-26 dated May 16, 1964.

That Notice contemplated, first, the nonsubstantive recodification of pertinent Civil Air Regulations and Regulations of the Administrator into the Federal Aviation Regulations and, secondly, deletion of procedural restrictions on the Administrator's authority to issue ADs. The first step was accomplished by amendment published in 29 F.R. 14403, October 20, 1964. This amendment accomplished the second step.

Part 39 imposes two restrictions on the issue of ADs for unsafe conditions. The unsafe condition giving rise to an AD must (1) have been found as a result of service experience and (2) be with respect to a design feature, part, or characteristic. Both restrictions were originally imposed, prior to the Federal Aviation Act, by the Civil Aeronautics Board (CAB) when it delegated the authority to issue ADs to the Civil Aeronautics Administration (CAA). The Federal Aviation Act of 1958 combined the safety rule making authority of the CAB and CAA and vested it in the FAA and these carried-over restrictions are contrary to the intent of that Act. This amendment removes the two restrictions from the regulations and will allow ADs to be issued for unsafe conditions however and wherever found.

Most of the comments received in response to the Notice of Proposed Rule Making were directed to the remark in the preamble that "an unsafe condition that results from maintenance, as well as one due to a design defect, will be subject to the issuance of an airworthiness directive." The Notice stressed, perhaps unduly, this one cause of unsafe conditions whereas, in actuality, there are many causes. It is clear from the foregoing discussion that the responsibilities placed on the FAA by the Federal Aviation Act justify broadening the regulation to make any unsafe condition, whether resulting from maintenance, design, defect, or otherwise, the proper subject of an AD. At the same time the Agency recognizes that use of ADs to correct improper or inadequate maintenance on the part of particular persons or

organizations would impose an unreasonable burden on the vast majority of persons who comply with the regulations and properly maintain their aircraft. The Agency, accordingly, will not issue AD’s as a substitute for enforcing maintenance rules. In

addition, the present provision that the unsafe conditions must be likely to exist or occur in other aircraft effectively precludes the issue of AD's to correct problems arising from poor maintenance practices on the part of an individual operator.

Two other comments, suggesting that the revised regulations go beyond the minimum standards and reasonable rules and regulations authorized by the Federal Aviation Act, opposed deletion of the restrictions on the ground that the way would thus be opened for abuses by individual FAA personnel. This amendment, as such, imposes no additional requirements on anyone. Only when it is implemented through the issue of future ADs will it have any regulatory effect. The issue of ADs is governed by the Administrative Procedure Act and its provisions relating to public notice and procedure. In addition, we agree with the commentators that the Federal Aviation Act of 1958 allows only the issue of minimum standards and reasonable rules and regulations. ADs are no different than the other types of rules issued by this Agency and we cannot and will not issue an AD unless we are convinced that its need and scope are fully justified.

Since service experience would now be only one of several bases that may generate an AD requiring a design change, the section 21.99 catchline is being amended to read "Required design changes."

Interested persons have been afforded the opportunity to participate in making this amendment. All relevant material submitted has been fully considered.

In consideration of the foregoing, Parts 21 and 39 of the Federal Aviation Regulations are amended as follows effective August 13, 1965.

This amendment is made under the authority of sections 601 and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1421 and 1423).

Amendment 21-4

Airworthiness Certification of Limited Category Aircraft

Adopted: July 23, 1965 **Effective: July 29, 1965**

(Published in 30 F.R. 9437, July 29, 1965)

The purpose of this amendment is to remove the current cutoff date for the issuance of original airworthiness certificates in the limited category.

Section 21.189(c) provides that no person may obtain an airworthiness certificate in the limited category after June 30,

1965, unless he shows that the aircraft was previously issued an airworthiness certificate in the limited category.

Surplus military aircraft have not been eligible for type certification in the limited category (formerly Part 9 of the Civil Air Regulations) since December 31, 1947. Therefore, limited airworthiness certification of surplus military aircraft has been limited to aircraft for which an application for type certification was made prior to that time. However, to provide a basis for the continued certification of surplus military aircraft, the Agency adopted a new Part 9a (now section 21.27) effective January 10, 1964, which would permit such aircraft to be type certificated and to receive airworthiness certificates in the standard category. In view of the restriction on the certification of aircraft in the limited category which had existed since 1947 and in view of the provisions of the new Part 9a, designed especially for surplus military aircraft, the Agency believed that there was no longer any need in the public interest for the issuance of original airworthiness certificates in the limited category. Therefore, at the time of the adoption of the new Part 9a, the Agency issued Amendment 1-9 announcing that original airworthiness certificates in the limited category would not be issued after June 30, 1965. As the preamble to Amendment 1-9 indicates, the Agency was aware that in at least a few instances immediate termination of original airworthiness certification in the limited category could result in substantial economic hardship to some persons. Therefore it was determined that limited airworthiness certificates should continue to be issued through June 30, 1965, to permit persons who had acquired surplus military aircraft an opportunity to certificate them.

However, it has subsequently become evident that there is substantial public interest in the continuation of the issuance of limited airworthiness certificates. Furthermore, it now

appears that a large number of aircraft are affected by the present regulation and that contrary to the Agency's previous understanding, many persons could suffer substantial economic hardship as a result of the regulation.

The Agency is aware that permitting the continued issuance of original airworthiness certificates in the limited category will not adversely affect safety. Under the present regulations, limited airworthiness certificates would only be issued for aircraft which have met the airworthiness requirements for type certification in the limited category and such aircraft would be subject to those limitations and conditions which the Administrator finds necessary for safe operation.

Since this amendment merely extends the provisions of an existing regulation and imposes no additional burden on any person, notice and public procedure hereon are unnecessary and good cause exists for making this amendment effective on less than 30 days' notice.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423).

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended effective July 29, 1965, by deleting paragraph (c) in section 21.189.

Amendment 21-5

Delegation Option Procedures for Products and Parts

Adopted: August 30, 1965 Effective: October 8, 1965

(Published in 30 F.R. 11373; September 8, 1965)

This amendment modifies Subpart J of Part 21 by (1) including additional types of aircraft and aircraft engines, (2) including parts for aircraft, aircraft engines, and propellers, and (3) removing the requirement that the manufacturer must employ a Designated Manufacturer's Certification Representative (DMCR) in order to use the Delegation Option Procedures.

This amendment is based on, and reflects industry comments concerning, Notice of Proposed Rule Making 65-2, published in the Federal Register (30 F.R. 953) on January 29, 1965. Except as modified by the following discussion, the reasons for these amendments are those in the Notice. Changes to the proposals in Notice 65-2, and Agency disposition of comments from industry, are as follows:

Certain rules governing the issue of Supplemental Type Certificates (STCs) and the amendment of airworthiness certificates were placed in the Notice to give the manufacturer the same privileges as were currently being proposed for air carriers and domestic repair stations under the Designated Alteration Station (DAS) procedures in Notice 63-17. Since Notice 63-17 excluded manufacturers, the equivalent proposal was made for manufacturers under Notice 65-2 to give full public notice with respect to manufacturers. Notice having been accomplished without significant opposition to the concept of extension of the DAS privileges to manufacturers, the rules

covering the issue of STC’s and the amendment of airworthiness certificates are deleted from this amendment and are to be included in new Subpart M of Part 21, which contains the DAS requirements. The Agency thus agrees with one comment from industry suggesting that the proper distinction between Subparts J and M of Part 21 is that between original type certification and supplemental type certification, respectively. This change is editorial only. The placement of the DAS requirements for the

manufacturer in new Subpart M of Part 21 is subject to any changes made to Notice 63-17, which changes appear in the final requirements for DAS authorizations (see Docket No. 1713). This change affects proposed Sections 21.231, 21.235(b), 21.239(c), 21.241, 21.251(b)(2) and (b)(5), 21.263, 21.267, 21.269(c), and 21.293(b) and (c).

Industry commented that Agency participation in the manufacturer's type certification programs is not necessary when authority is delegated to responsible manufacturers, and requested that the Agency either divorce itself completely from involvement in the type certification programs of manufacturers, or else specify a certain frequency of inspection.

As stated in the Notice, the responsibility of the Agency for the type certification of products is clear under Sections 601 and 603 of the Federal Aviation Act of 1958. The power under Section 314 of the Act to delegate any "work, business, or function" does not relieve the Administrator of the underlying duties prescribed in Sections 601 and 603 of the Act. The use of the power of delegation must clearly be consistent with the underlying duties, since the Act nowhere provides for the delegation of the duties themselves. Thus, Section 314 provides that delegations made by the Administrator be made "in exercising the powers and duties vested in him by this Act" (emphasis supplied). To completely divorce the Agency from the certification programs of manufacturers would be to ignore, rather than exercise, those powers and duties.

The only industry contention that the Agency can consider in this area is thus whether a specific degree, or frequency, of supervision or inspection should be specified, across the board, in the delegation option procedures themselves. If such a frequency were specified, it would defeat the proper administration of the delegation option procedures in two respects. For manufacturers who demonstrate that, for specific programs, less supervision is consistent with the Administrator's duty to promote safety, the specified frequency would be an unnecessary burden. In cases where more supervision is required in order to discharge that duty, the specified frequency would amount to an apparent limitation, imposed by the Administrator on himself, of the Administrator's power to effectively discharge his duties. Neither result is consistent with effective rule making. The proper administration of the delegation option procedures requires that the degree of supervision be adjusted to fit each case. For this reason, the preamble to the Notice stated that the Agency will "establish appropriate initial inspection intervals under Sections 21.249 and 21.293, and will modify the intervals of inspection as service experience warrants" (emphasis supplied). The assignment of a specific frequency of inspection would be an arbitrary action involving prejudgment of certification programs as yet unknown to the

Agency.

In urging the divorce of the Agency from the type certification programs of manufacturers, one comment further cites the fact that Section 314 of the Act provides that delegation under that Section is subject to such regulations, supervision, and review as the Administrator "may" prescribe. The Agency agrees that Section 314 does not require the prescription of particular regulations, supervision, or review of delegated functions. Nor is this assumed or relied on by the Agency in declaring its intent to review each certification program, on its own merits, in the interest of safety. Rather, the Agency in so doing is concerned, as stated above, with the duties prescribed in Sections 601 and 603 of the Act.

Regardless of the competence of individual manufacturers, which is not in issue here, these comments are inconsistent with the Administrator's duties under the Act and cannot be accepted.

With respect to proposed Section 21.239, comments recommended that a specific, single individual be given the total responsibility delegated to the manufacturer in order to promote good management. The specific manner in which the manufacturer discharges his delegated responsibilities are management prerogatives that should not be controlled by the Agency unless, in an individual case, specific practices adversely affect safety, in which case appropriate changes to those practices will be made.

Two changes are made to Section 21.239. First, paragraph (a) is amended to make clear the original intent of that paragraph to cover only type certificates issued to the manufacturer under standard procedures, that is, under Subpart B of Part 21. Section 21.239 has never been administered to include type certificates transferred to the manufacturer since the assumption of underlying certification experience and ability cannot generally be made in such cases. This change is clarifying only. Second, whereas proposed Section 21.239(c) allowed the appropriate staff to be employed "or available," this amendment requires the staff to be employed. This preserves the intent of Section 21.239(c), as it was before this amendment. The type certification of entire products involves a continuous need for a staff competent to conduct all phases of certification, from initial design to production. Evaluation of such a staff by the Agency, as of the time that eligibility for a delegation option authorization is being determined, must be done prospectively, on the assumption that the staff will be continuously used by the manufacturer. Whereas, for the DAS, the need for specific personnel may be infrequent and difficult to define prospectively with respect to specific personnel

requirements (since the precise nature of individual supplemental

type certification programs may not be known when initial eligibility is being determined), the kind of activity to be involved in original type certification programs must be known to the Agency when application for a delegation option authorization is received, and the existence, at that time, of a complete, organized staff capable of executing all phases of those programs is thus essential to responsible delegation, by the Agency, in the field of original type certification. Therefore, while responsible delegation to a DAS requires only that qualified specialists be available when needed, such delegation in the field of type certification requires that the complete staff be employed so that it can be evaluated, as a complete staff, before a delegation authorization is granted.

The Notice provided for the issue of airworthiness approval tags for engines and propellers manufactured under the delegation option procedures. This amendment broadens this to include the issue of airworthiness approval tags for parts of products. The proposed delegation of responsibility to issue airworthiness certificates for complete aircraft and airworthiness approval tags for other complete products can safely include responsibility to issue airworthiness approval tags for parts of such products. This change appears in Sections 21.231, 21.251, and 21.271. In addition, proposed Section 21.271 is changed to make it clear that it applies to all products included in the limits of applicability section (Section 21.251).

One industry comment recommended deleting the requirement in proposed Section 21.261 that the manufacturer obtain the Administrator's concurrence respecting the application of the pertinent equivalent safety provisions. The authority to make interpretations requiring substitution of one airworthiness rule for another has never been delegated to private persons, since it involves the prescription of airworthiness standards rather than the selection and application of standards already prescribed by the Administrator. Only the latter is delegated by this amendment.

The numbering of the following sections has been changed to preserve the numbering of present Part 21: Proposed Section 21.269 is now Section 21.273; Proposed Section 21.273 is now Section 21.269.

One comment suggested that the statement in the preamble to the Notice, to the effect that the experimental certification requirements of Subpart H of Part 21 will continue to apply to holders of delegation option authorizations, could cause some

confusion with the specific experimental certification requirements in the proposal. As in any case where specific requirements differ from general requirements, the general requirements apply where the specific requirements are silent. The statement in the Notice thus means that, where the delegation

option procedures apply, they supersede those in Subpart H, and where the delegation option procedures are silent, Subpart H will govern experimental certification.

One comment concerning proposed Section 21.275(a)(1) recommended deleting the proposed requirement that the issue of experimental certificates be limited to those aircraft for which the manufacturer has applied for a type certificate. The comment specifically recommends that the authorization to issue experimental certificates be broadened to cover experimental aircraft used for research and development not aimed at obtaining a type certificate. The intent of the proposals in the Notice is solely the delegation of functions related to the manufacturer's type certification programs covered by the delegation option procedures. No intent to delegate unrestricted experimental certification functions to private persons has been contemplated, justified, or developed in the Notice. This comment cannot, therefore, be accepted.

It was further recommended that proposed Section 21.275(a)(2) be deleted as surplusage, since the more general provisions of Section 21.275(a)(1) appear to cover aircraft that have undergone changes requiring flight tests. Insofar as an amended type certificate is a form of a type certificate, the comment is correct and is accepted. However, the distinction between proposed Section 21.275(a)(1) and (a)(2) is important because the authority delegated to prescribe operating limitations for experimental certificates issued by the manufacturer is limited to experimental certificates issued pursuant to amendments of existing type certificates, whereas this authority is not intended to be delegated with respect to new designs involving an original, rather than amended, type certificate. This specific limitation is preserved in this amendment (see Section 21.275(b)).

One comment concerning Section 21.275(b) recommended requiring that the manufacturer, not the Administrator, specify the limitations to be placed on an experimental certificate. It is recognized that the manufacturer may have need for limitations that would not be considered necessary for safety by the Administrator, and that the proposed language appears to preclude the prescription of those limitations by the manufacturer. This comment is accepted, in part, with respect to aircraft for which

the manufacturer holds the type certificate and has applied for an amended type certificate, and which have undergone changes requiring flight tests. The rule is changed to let the manufacturer specify the limitations and conditions that he considers necessary for operation, under an experimental certificate, of aircraft to be operated to show compliance with the applicable airworthiness requirements if the manufacturer has submitted an application for an amended type certificate. However, complete divorce of the Agency from responsibility for

the safe operation of aircraft under experimental certificates is not intended. Therefore, this amendment, like the Notice, requires the manufacturer to obtain any limitations and conditions that the Administrator considers necessary for safety in every case in which an experimental certificate is issued by the manufacturer.

Certain editorial, nonsubstantive changes have been made to Sections 21.277, 21.283, and 21.285. Section 21.277(a) is streamlined and shortened to include only its mandatory elements. Section 21.277(b) is deleted as surplus with Section 21.249. Section 21.277(c) is deleted because it adds nothing to the combined effect of Sections 21.249 and 21.293(b). Sections 21.277(d) and 21.283 are deleted as nonmandatory and as unnecessary under the powers vested in the Administrator by Section 314 of the Act. Finally, Section 21.285 is deleted as nonmandatory and because the processing of certificate actions is covered by Part 13 of the Federal Aviation Regulations.

After further consideration and in response to comments received, the change proposed to Section 21.289 in Notice 65-2 has not been incorporated in this final amendment. Under current Section 21.289, a DMCR employed by a manufacturer may approve major repairs and alterations. Since under this regulation, the manufacturer now holds the delegated authority from the Administrator, the Agency considers it appropriate to continue in effect the present provisions of Section 21.289 for such manufacturer.

One comment recommended deleting the requirement in Section 21.289 that employees authorized by the manufacturer to sign FAA Form 337 and make required log book entries be listed on the manufacturer's delegation option authorization application. No burden is created by this requirement since it does not describe who may or may not be listed. Further, it aids the efficient administration and control of approvals made under Section 21.289. This comment cannot, therefore, be accepted.

Interested persons have been given an opportunity to

participate in the making of this amendment, and careful consideration has been given to all relevant matter presented.

In consideration of the foregoing, Chapter I of Title 14 of the Code of Federal Regulations is amended, effective October 8, 1965, as hereinafter set forth.

This amendment is made under the authority of Sections 313(a), 314, 601, 603, 608, and 609 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1355, 1421, 1423, 1428, and 1429).

Designated Alteration Station (DAS) Authorizations For Manufacturers, Air Carriers, Commercial Operators, and Domestic Repair Stations

Adopted: August 30, 1965 Effective: October 8, 1965

(Published in 30 F.R. 11376; September 8, 1965)

This amendment lets eligible air carriers (except air taxi operators), commercial operators of large aircraft, domestic repair stations, and manufacturers of products act as designated alteration stations (DAS) for the purpose of (1) issuing supplemental type certificates (STCs) for type certificated aircraft, aircraft engines, and propellers, (2) issuing experimental certificates for aircraft that are altered by the DAS under such STC's and require flight tests and (3) amending standard airworthiness certificates for such aircraft.

This amendment is based on, and reflects industry comments concerning, Notice of Proposed Rule Making 63-17, published in the Federal Register (28 F.R. 4095), on April 25, 1963. Except as modified by the following discussion, the reasons for these amendments are those in the Notice. Since Part 21 is now effective, this amendment adds a new Subpart M to that Part rather than a new Part 411 as proposed in the Notice of Proposed Rule Making. This new subpart is arranged and numbered to correspond, where appropriate, to similar sections in Subpart J. In the following discussion, references to Part 411 refer to section numbers in the Notice. The applicability of this amendment is changed from that of the Notice in three respects. The Notice proposed to include air taxi operators, exclude all commercial operators, and exclude manufacturers of products. This amendment excludes air taxi operators, includes commercial operators of large aircraft, and includes manufacturers of products.

When Notice 63-17 was published prior to the adoption of Part 135 Air Taxi Operators and Commercial Operators of Small Aircraft, air taxi operators, as such, had a regulatory basis for the performance of maintenance, since they could establish and follow a continuous airworthiness maintenance program, similar to those of other air carriers, under the deviation authority of former Part 42. Part 135, under which air taxi operators must now operate, does not provide for the performance of maintenance by air taxi operators, nor does Part 43 Maintenance, Preventive Maintenance, Rebuilding, and Alteration, let air taxi operators perform maintenance as air taxi operators. As the preamble to the Notice stated, the Agency intends to give DAS authorizations to air carriers only for products that they are "authorized to maintain and operate" under their operating certificates. There is currently no regulatory basis for such authorizations with respect to air taxi operators.

Commercial operators of large aircraft, on the other hand, have a regulatory basis for maintenance authority under their operating certificates. The maintenance requirements of Part 121 Certification and Operations: Air Carriers and Commercial Operators of Large Aircraft apply, without significant distinction, to "all certificate holders." Part 43 provides that commercial operators may perform maintenance as prescribed in their operating regulations. There is no valid reason for excluding commercial operators of large aircraft as a class.

For all applicants, individual eligibility for a DAS authorization must of course be determined under Section 21.439 of this amendment.

The extension of the applicability of the DAS requirements to cover manufacturers of products follows Notice 65-2, published in the Federal Register (30 F.R. 953) on January 29, 1965, in which it was stated that the reasons advanced in Notice 63-17 for giving the DAS privilege to air carriers and domestic repair stations "are valid for manufacturers with respect to products for which they hold the type certificate." Requirements analogous to those proposed in Notice 63-17 were thus given public notice in Notice 65-2. While comments to Notice 65-2 suggested that the application of the DAS requirements to the manufacturer of products should be done in new Subpart M (which is the subject of this amendment), no comments were received which indicated that the manufacturer of products should be differently regulated, as a DAS, than are air carriers or domestic repair stations. Notice having been given for the manufacturer in this respect, the manufacturer is included in this amendment subject to all changes made as a result of comments to Notice 63-17. Since the experience and capability upon which the Agency relies in delegating DAS functions to the manufacturer, as to the other persons covered by this amendment, is the demonstrated alteration ability of the applicant, and since the manufacturer's alteration authority, under which such alteration experience and capability must be derived, is defined in Section 43.3(i), the products for which the manufacturer is authorized to obtain a DAS authorization are limited, consistent with Section 43.3(i), to those which he is authorized to alter, namely, those which are manufactured by him and for which he holds a type or production certificate, or which he manufactured under a Technical Standard Order or Product and Process Specification issued by the Administrator.

Section 21.113 of the Federal Aviation Regulations requires each person who does not hold the type certificate for a product to apply to the Administrator for the issue of an STC for each major change in type design that does not require a new type certificate. This procedure has caused delays in the approval of STCs and thus in the making and approval of major alterations

under such STCs. The cause and need for these delays have been studied by the Agency in cooperation with an industry committee representing modification facilities. The committee recommended that, while the STC program should be continued, the delays can and should be lessened by letting qualified repair stations issue STCs as well as make and approve major alterations.

After studying the committee's recommendation in the light of experience gained in issuing STCs and evaluating alteration programs, the Agency believes that the need to eliminate unnecessary delay justifies the requested delegation, not only with respect to many domestic repair stations, but also with respect to many air carriers and manufacturers. The Agency welcomes this opportunity to keep the burden on regulated persons to the minimum consistent with its responsibility under the Federal Aviation Act of 1958.

In carrying out its responsibility under Title VI of the Act, the Agency will evaluate the certification programs under Sections 21.441 and 21.493, conduct periodic inspections of the activities of each DAS, establish appropriate inspection intervals under Sections 21.449, 21.451, and 21.493, and modify these intervals as service experience warrants. Any additional limitations necessary to ensure the adequacy of individual certification programs will be imposed under Section 21.451.

Section 21.1(a)(4) is deleted since (a)(1) is broad enough to cover new Subpart M and the applicability section (Section 21.431) speaks for itself.

One comment requested that air carrier applicants be required to have repair station certificates with appropriate ratings. The eligibility requirements of this amendment impose an equal burden on repair stations and air carriers. The Agency believes that, within the limitations of their respective operating certificates, an air carrier who meets the eligibility requirements of this amendment has a level of responsible expertise equal to that of a certificated repair station who also meets those requirements. Therefore, to require an air carrier to obtain a repair station certificate would be a mere formality. These considerations also apply to commercial operators of large aircraft.

Proposed Section 411.34 would have required the DAS to obtain an experimental certificate, with appropriate limitations, from the Agency for each aircraft that, after alteration, requires flight testing to establish compliance with the applicable airworthiness requirements. That section would also have permitted the DAS to "issue" an airworthiness certificate (other than experimental) upon the satisfactory completion of the required flight testing. This proposed section is changed in two respects under this amendment. First, the DAS is given authority

to issue experimental certificates subject to any limitations and conditions deemed necessary for safety by the Administrator. The Agency believes that necessary flight testing can be safely expedited in this manner without requiring separate application by the DAS for an experimental certificate for each aircraft of the same type identically altered under the same STC. The limitations and conditions imposed by the Administrator would apply to each experimental certificate issued by the DAS for these aircraft. This relaxing change appears in Sections 21.451 and 21.475. Second, the word "issue", with respect to airworthiness certificates other than experimental, is changed to "amend". This clarifying change involves no substantive departure from the Notice of Proposed Rule Making. Questions have been raised as to whether the word "issue" includes the original airworthiness certification of aircraft that have never been airworthiness certificated, and as to whether it includes the issue of a standard airworthiness certificate for aircraft that come to the DAS in another (e.g. restricted) airworthiness classification. While the preamble attempted to prevent such confusion by stating that the DAS may "reissue" standard airworthiness certificates, this has raised the further question whether the DAS, under his authority to "issue" airworthiness certificates, may "reissue" a standard airworthiness certificate, after flight testing, for an aircraft whose airworthiness certificate has been surrendered, revoked, or otherwise terminated. None of these questioned privileges are within the intent of the Notice. The intent of the Notice with respect to airworthiness certification, which remains unchanged in this amendment, is as follows: After altering an aircraft having an effective standard airworthiness certificate, and after satisfactorily completing all necessary flight tests under an experimental certificate, the DAS may return the altered aircraft to the standard airworthiness classification, thus establishing, without independent Agency concurrence, that (1) the aircraft, as altered, conforms to the type design and the new type design data providing the basis for the STC issued by the DAS, and (2) the aircraft is in condition for safe operation. This is the meaning of the term "amendment" as used in the regulations and in FAA Form 305, Application for Airworthiness Certificate. Procedurally, the DAS may sign the Form 305 without independent signature by an Agency inspector, and he will merely be required to send the completed application to the Agency for information. This change to "amend" appears wherever "issue" was used in the Notice.

Section 21.439(b) (411.10(b)) prescribes the minimum staff qualifications for a DAS authorization. Comments asked whether all of the listed qualifications must be met by one person rather than met collectively by several persons. These qualifications are generally those required of an FAA Designated Engineering Representative, and are the minimum necessary for evaluating an STC program. Section 21.439(b) therefore makes it clear that all

of the listed requirements must be met by a single person. Comments further suggested that the DAS staff be employed by the DAS rather than be merely "available". So long as the required staff is in fact available when needed, a requirement that the staff be employed would be surplus with respect to the objective of the rule, and would unnecessarily prevent otherwise qualified applicants from participation in the DAS program. This suggested change is not necessary for safety and is therefore rejected.

The preamble to Notice No. 63-17 proposed to exclude repair stations with limited ratings from participation in the DAS procedures. The stated reason for this exclusion was the need for a DAS to be "capable of performing and approving the alteration work itself". Each repair station's qualifications will be carefully evaluated under Section 21.439. Each repair station must meet the applicable requirements of Part 145, particularly Sections 145.35 through 145.39. With minor exceptions, these sections do not distinguish between repair stations with and without limited ratings. The permanence and quality of the facilities of each repair station are continuously under Agency supervision under Part 145. Given full compliance with that Part, the Agency believes that the distinction between repair stations with and without limited ratings should not determine eligibility under the DAS procedures, and that failure to qualify should be determined by individual evaluation of each repair station's qualification under Subpart M of Part 21, particularly Section 21.439.

Proposed Section 411.12 is omitted in the final rule since the authorization language is surplus and the note material is nonregulatory. No substantive change results from this deletion.

Section 21.441 contains the procedure manual material proposed in Section 411.32. The final rule requires that the applicant submit and obtain approval of the manual before acting as a DAS, rather than merely "provide" the manual as in the Notice. This is done since the manual is one means of Agency supervision of the certification activities of the DAS. To further serve this end, and to carry out the proposed requirement (Section 411.32(b)) that the manual at all times reflect the current staffing and procedures that are being used, this requirement is combined with the requirement, proposed in Section 411.14(b), that the DAS obtain prior approval of changes in facilities or staff necessary to continue to meet the eligibility requirements of Section 21.439 (Section 411.10). The manual is an appropriate place to reflect the necessary approval. Comments suggested that the words "prior approval" in Section 411.14(b) could be interpreted to prevent all DAS activity until approval is obtained. This language is therefore changed in Section 21.441(b) to prohibit only the continued performance of functions actually affected by the change. Thus, if the DAS is qualified to issue STCs for products of more than one type, and

the specified changes affect only the issue of STCs for one of those types, only that activity would be prohibited until the changes are approved by the Administrator and entered in the procedure manual. Similarly, if the specified changes affect only the airworthiness certification activity of the DAS, only that activity would be prohibited. This places a realistic limitation on the "current staffing and procedures" requirement in Section 411.32(b) by preventing departures from proper procedures without at the same time requiring unnecessary paper work or unnecessary curtailment of unaffected activities.

Section 411.13 proposed to require return of the authorization certificate when the DAS no longer "intends" to operate as a DAS, and proposed to terminate the authorization automatically one year after issue. The subjective test for return of the certificate is replaced with an objective test based on effectiveness of the certificate itself. The one-year requirement is deleted since the added supervision incident to annual renewal would add little to the supervision and inspection already provided for in the DAS procedures during the year of operation itself. There being no need for renewal, the 60-day renewal period is of course deleted.

The maintenance-of-eligibility requirement (Section 411.14) has been changed insofar as the prior-approval requirement has been moved to the procedure manual section (Section 21.441) and

no longer directly determines continued eligibility, and insofar as the requirement to continue to meet the requirements for issue of the authorization is now modified, in Section 21.445, to allow a 48-hour period in which to bring suspected cases of noncompliance to the attention of the Administrator without penalty. It should be noted that this section requires continued compliance with the requirements for issue of the DAS authorization regardless of whether any DAS function is being performed, whereas Section 21.441(b) prohibits the performance of "affected" DAS functions in the face of the specified changes. The 48-hour period in Section 21.445 does not apply to Section 21.441(b).

One comment questioned the need for the inspection provision of Section 411.16. Section 314 of the Act provides that delegations of the kind involved in this amendment are subject to such supervision and review as the Administrator may prescribe. The Agency regards the inspection procedures of Section 411.16 as a necessary basis for such supervision and review in the case of designated alteration stations. Section 21.449 thus preserves this inspection provision. However, in the light of the provisions of Section 21.451(c) and Section 21.493, the second sentence of Section 411.16 is deleted as surplus.

Section 411.33 is changed in two respects in Section 21.463. First, Section 21.463 makes it clear that the procedure manual

must be followed in the issue of STCs. This carries out the intent of Section 411.32. Second, the requirement in Section 411.33 that the DAS obtain the Administrator's concurrence with submitted data is, with one exception, omitted in Section 21.463. This is in response to comments questioning the need for concurrence in addition to the other provisions for review by the Administrator. The exception concerns the equivalent safety provisions under Section 21.21. If the airworthiness requirements that the applicant determines to be applicable include the application of equivalent safety provisions, the Administrator's concurrence must, as in the delegation option procedures of Subpart J of Part 21, be obtained. The authority to make interpretations requiring substitution of one airworthiness rule for another has never been delegated to private persons since it involves the prescription of airworthiness standards rather than the selection and application of standards already prescribed. Only the latter is delegated. A requirement, similar to that in Section 21.261, is thus added to this amendment (Section 21.461) to make it clear that (1) the use of equivalent safety provisions is not precluded, and (2) such use requires the Administrator's concurrence.

Under proposed Section 411.33, failure of the DAS to determine the applicable FAA policies, procedures, and practices would have been a technical violation. While the Agency makes this information available for public information, it is within the exclusive control of the Agency and does not automatically receive the public exposure given rules. Periodic review will be made to advise the DAS with respect to this information, but the determination of which policies, procedures, and practices apply is not made the subject of a rule.

Section 21.477 (Section 411.35) makes it clear that the DAS need not act under the rule until notified by the Administrator.

Proposed Section 411.36 is omitted in the final rule. The rules in this amendment prescribing the DAS responsibility, and the Administrator's authority under Section 314 of the Act to rescind any delegation for any appropriate reason, make a formal noncompliance section unnecessary.

Section 21.493 makes more specific the intent in Section 411.37 that the technical data file (now in Section 21.493(a)(1)) need include only those records necessary for the issue of the STC, and that only this data file need be transferred to the Administrator.

Proposed Section 411.38 is omitted as nonregulatory. That proposed section does, however, reflect Agency policy with respect to protecting the interests of the holders of STCs. The Agency will publish lists of STCs whose holders agree to make them available to others and for which data will support the making of identical alterations. Data submitted under new Subpart M will not be released without written permission from

the owner of the data.

Proposed Section 411.39 is omitted as surplus in the final rule. This amendment in no way affects the production certification procedures of Subpart G of Part 21.

One comment suggested that helicopters above a certain maximum weight should be excluded from the DAS procedures. No STC may be issued for any product under this amendment unless all applicable airworthiness requirements, substantive and procedural, are met. Except where helicopter weight affects those requirements, or limits alteration authority under an applicant's operating certificate, no valid reason exists for making that weight determine eligibility under the DAS procedures.

One comment suggested that independent engineering firms be eligible for a DAS authorization if a suitable, but separate, repair station is available to make the alterations. All or part of such a firm may be employed by, or available to, a repair station that meets the other requirements for a DAS authorization (see Section 21.439(a)(4)). This provision demonstrates the Agency's confidence in the competence of the independent engineering firm. However, this relationship of employment or availability cannot be reversed to qualify the independent engineering firm as a DAS in its own right, regardless of its competence. Continued, ready supervision of facilities, staff, and data by the Agency is the basis on which delegation in this field can be made practical. Holders of DAS authorizations may make the major alterations that they approve under the authorization. A repair station's ratings and limitations are approved and reviewed by the Agency, and its facilities are known to the Agency through an existing certification process. No similar process assures that an engineering firm will have a permanent business location or continued access to a qualified alteration facility. Supervision is difficult where the technical data and the product being altered are remote from each other. For these reasons, Section 21.439 requires that the DAS must "have" the appropriate alteration facilities, rather than merely have them "available". This suggestion must, therefore, be rejected.

Interested persons have been given an opportunity to participate in the making of this amendment, and careful consideration has been given to all relevant matter presented.

In consideration of the foregoing, Chapter I of Title 14 of the Code of Federal Regulations is amended, effective October 8, 1965, as hereinafter set forth.

This amendment is made under the authority of Sections 313(a), 314, 601, 603, 608, and 609 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1355, 1421, 1423, 1428, and 1429).

Amendment 21-7

Duration of Class I Provisional Type Certificate

Adopted: November 8, 1965 Effective: November 16, 1965

(Published in 30 F.R. 14310; November 16, 1965)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to prescribe a 24-month fixed duration for a Class I provisional type certificate.

In a typical industry situation, Class I provisionally type certificated prototype aircraft which are being used for sales demonstrations, market surveys, development projects and the like during the type certification process, are not in conformity with type design at the time the type certificate issues. Since, under the present requirements of sections 21.77 and 21.217, a Class I provisional type certificate and associated provisional airworthiness certificates expire at the time of issue of the type certificate, the manufacturer must at that time either cease whatever operations he is conducting with those aircraft until they are brought into conformity with the type design or curtail his operations under an experimental certificate.

The Agency is aware that neither of these alternatives is necessary in the interest of safety and in recognition of this fact and the fact that the present requirement imposes a hardship on the manufacturers, the Agency has previously granted exemptions extending the duration of Class I provisional type certificates.

In the light of the foregoing, the Agency considers it appropriate to amend the regulations to permit all manufacturers to continue to use provisionally certificated aircraft under the conditions and limitations applicable thereto, for a total of 24 months notwithstanding the fact that a type certificate has been issued for the aircraft.

This amendment deletes those portions of section 21.77 that automatically terminate the effectiveness of a Class I provisional type certificate upon issuance of the corresponding type certificate, supplemental type certificate, or Class II provisional type certificate. In giving the Class I provisional type certificate a definite duration, it is brought in line with the duration provisions for Class II certificates.

Since this amendment removes an unnecessary restriction and

imposes no additional burden on any person, the Agency finds that notice and public procedure on this amendment are unnecessary and that good cause exists for making it effective on less than 30 days notice.

This amendment is made under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423).

In consideration of the foregoing, section 21.77(b), Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended, effective November 16, 1965.

Amendment 21-8

Miscellaneous Amendments to the Export Airworthiness Approval Procedures

Adopted: January 28, 1966 Effective: January 28, 1966

(Published in 31 F.R. 2421, February 5, 1966)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to clarify the existing regulations concerning those persons authorized to perform the inspections required for certain classes of export approval and to delete the overhaul requirement presently applicable to used engines, propellers, and appliances, exported as a part of an aircraft.

Under the current requirements of section 21.329, used aircraft must have undergone a periodic inspection and be approved for return to service in accordance with the applicable provisions of Part 43 of the Federal Aviation Regulations. In addition, used engines and propellers which are not being exported as part of a certificated aircraft must have been newly overhauled. In accordance with the provisions of Part 43, mechanics holding inspection authorizations are authorized to perform periodic inspections and overhauls to the extent provided in Part 65 of the Federal Aviation Regulations and air carriers and commercial operators are authorized to perform similar functions as provided in Parts 121 or 127 of the Federal Aviation Regulations. Under Parts 121 and 127, air carriers are limited to the performance of maintenance on their own or other air carrier aircraft in accordance with applicable continuous airworthiness maintenance programs and commercial operators are limited to performing maintenance on their own aircraft in accordance with such programs, and the Agency has applied such limitations to their performance of the necessary inspections and overhauls for export approvals. However, notwithstanding the foregoing, the present provisions of section 21.337 do not list air carriers, commercial operators or persons holding inspection authorizations as being authorized, under any condition, to perform the inspections and overhauls required for export airworthiness approval. The notice of proposed rule making that preceded the adoption of present section 21.337 listed air carriers as persons authorized to perform the required inspections and overhauls for export approval. However, as the

preamble of the final amendment clearly indicates, air carriers were not included in the provisions of section 21.337 as proposed in order to remove the implication that the air carriers could perform the required inspections and overhauls without

limitations and not to prevent air carriers from performing such functions within the limitations imposed by Parts 121 and 127. This would also be applicable now to commercial operators conducting their operations under Part 121. This oversight has created considerable confusion and the provisions of section 21.337 require clarification. For this reason, the requirements of section 21.337 have been amended consistent with the foregoing to include air carriers, commercial operators and the holders of inspection authorizations.

In addition to the foregoing, the provisions of section 21.329 have been amended by deleting the requirement that used engines, propellers and appliances being exported as part of an aircraft must have been overhauled within the last 500 hours' time in service prior to being exported. The Agency now considers that this requirement is unnecessary for the purpose of establishing the airworthiness of such products in the light of the existing requirement that used aircraft being exported must have undergone a periodic inspection and be approved for return to service. Under a periodic inspection, the condition of the engines, propellers and appliances installed on an aircraft must be investigated and if it is found that an overhaul of such engines, propellers or appliances is necessary in order to make them airworthy, the aircraft cannot be approved for return to service until such overhaul has been performed. As amended herein, only the necessary overhauls of used engines, propellers and appliances need be performed and exporters would be relieved of the substantial economic burden of overhauling engines, propellers, and appliances regardless of the actual condition of such products as required under the current rules.

Finally, as noted above, section 21.329(c) requires that used aircraft must have undergone a periodic inspection and be approved for return to service in accordance with the applicable provisions of Part 43 of the Federal Aviation Regulations. In addition, it requires that this inspection must have been performed within 30 days before the date the application is made for an export certificate of airworthiness. The requirement for a periodic inspection was intended only to identify the scope of the inspection which the Agency considers necessary for export approval of used aircraft and the rule has been amended to make this clear. Moreover, it has been brought to the attention of the Agency that the requirement for a periodic type of inspection does not take into proper account the scope of the other forms of inspections used on civil aircraft. In this connection, the present requirement requires a complete periodic type inspection notwithstanding that some of the inspections required under a

periodic inspection may have already been accomplished under an

established continuous airworthiness maintenance program or progressive inspection program within the 30 days prior to the date that the application for export approval was made. Therefore, to prevent the unnecessary duplication of inspections, the provisions of section 21.329(c) have been amended to permit consideration of inspections performed within 30 days prior to the date an application is made for export approval on aircraft maintained in accordance with a continuous airworthiness maintenance program under Part 121 or 127 of the Federal Aviation Regulations or a progressive inspection program under Part 91 of the Federal Aviation Regulations.

Since these amendments remove unnecessary restrictions, are clarifying in nature and impose no additional burden on any person, notice and public procedure hereon are unnecessary and they may be made effective on less than 30 days' notice.

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations, (14 CFR Part 21) is amended effective January 28, 1966, as follows.

1. Section 21.329 is amended by striking out present paragraph (e) and by redesignating paragraphs (f) and (g) as paragraphs (e) and (f), and by amending paragraph (c).

2. Section 21.337 is amended by adding new paragraphs (d), (e), and (f).

These amendments are made under the authority of sections 313(a), 601 and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421 and 1423).

Amendment 21-9

Change of Name of "Periodic Inspection" to "Annual Inspection," and Clarification of 100-hour Inspection Requirement

Adopted: February 25, 1966 Effective: April 2, 1966

(Published in 31 F.R. 3336; March 3, 1966)

These amendments change the name "periodic inspection" to "annual inspection" throughout the Federal Aviation Regulations, and make clear the conditions under which an inspection satisfying the 100-hour inspection requirement of section 91.169(b) also satisfies the annual (formerly "periodic") inspection requirement of section 91.169(a). No substantive change is made by these amendments.

These amendments are based on, and are issued for the

reasons contained in, Notice 65-26, published in the Federal Register (30 F.R. 13167), on October 15, 1965. All comments received in response to Notice 65-26 favored the changes proposed therein.

Comments not directly related to the notice suggested (1) that the references to Part 43 in section 91.169 be changed to references to Part 65, (2) that the "excess time" provision of section 91.169(b) be deleted, and (3) that the authority of the holder of an inspection authorization to approve products for return to service be made explicit in section 65.95(a)(2). These comments do not affect the disposition of Notice 65-26 and will be given future consideration.

In consideration of the foregoing, Chapter I of Title 14 of the Code of Federal Regulations is amended, effective April 2, 1966, as hereinafter set forth.

These amendments are made under the authority of sections 313(a) and 601 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a) and 1421).

Amendment 21-10

Cross Reference Corrections in FAR Parts 21, 33, 37, 43, 61, 63, 91, 127, 133, 141, 145, 149, and 183

Adopted: June 28, 1966 **Effective: July 6, 1966**

(Published in 31 F.R. 9211, July 6, 1966)

These amendments update certain cross references in the Federal Aviation Regulations and make other miscellaneous corrections.

At the time of the recodification, it was necessary to include in the Federal Aviation Regulations cross references to the Civil Air Regulations or Special Civil Air Regulations where the referenced provision had not yet been recodified. These amendments update all these cross references in instances where no substantive change is involved. In some instances, the cross references as updated herein have been anticipated in compilations and reprints of the respective Parts of the regulations.

For convenience, a table is utilized to state the changes that can be accomplished by a mere substitution of the proper cross reference.

The original publication of section 91.101(a) referred to the "Bureau of Commerce" instead of the "Bureau of Customs". This error is being corrected. The introductory sentence of subparagraph (b)(5) of Appendix B of Part 141 is corrected by the

addition of a line of text that was inadvertently omitted in the recodification.

Since this amendment does not involve any substantive change and does not impose a burden on any person, notice and public procedure thereon are unnecessary, and the amendment may be made effective immediately.

In consideration of the foregoing, Chapter I of Title 14 is amended, effective July 6, 1966.

This amendment is made under the authority of section 313(a) of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a)).

Amendment 21-11

Export Airworthiness Approval

Adopted: September 16, 1966 Effective: October 22, 1966

(Published in 31 F.R. 12565, September 23, 1966)

The purpose of this amendment to Part 21 is to clarify the requirements of section 21.339 governing the issuance of special export airworthiness approvals for aircraft. The United States has concluded reciprocal agreements with a number of foreign countries governing the import and export of aeronautical products. These agreements provide for the mutual validation or acceptance of export certificates of airworthiness issued for aeronautical products which are manufactured in and meet the airworthiness requirements of the country of export and any special requirements of the importing country.

Section 21.339 provides for the issuance of special export certificates of airworthiness for aircraft located in the United States that are to be flown to various foreign countries for the purpose of demonstrating the aircraft to prospective purchasers. Under this regulation an export certificate of airworthiness appropriate for validation or acceptance in any of the foreign countries involved may be issued prior to departure of the aircraft from the U.S. if, among other things, the special requirements of each of the prospective importing countries are met.

While the special requirements of some of the foreign countries with which the U.S. has reciprocal agreements specifically require that imported aircraft comply with certain of the airworthiness standards of those countries, the majority of the special requirements merely involve requests for various documents, information and materials related to the imported aircraft, such as flight manuals, logbooks, and maintenance, overhaul and repair manuals.

In this connection, recent inquiries from certain U.S. manufacturers concerning section 21.339 indicate that some confusion exists as to whether the Agency intended to require an applicant for a special export certificate of airworthiness for an aircraft to furnish each of the prospective importing countries with the various documents, information and materials identified in their special requirements. These manufacturers have requested that the regulation be clarified in this respect.

As previously noted, the various reciprocal agreements provide for the mutual validation of export certificates of airworthiness issued for products which are manufactured in and meet the airworthiness requirements of the country of export and any special requirements of the importing country. Since the importing country is not known at the time an application for a special export certificate is filed, the Agency must necessarily determine that the applicant can meet the special requirements of each of the prospective importing countries at that time. It was not intended, however, that an applicant must furnish each of the prospective importing countries with the documents, information, and material specified in their individual special requirements, but merely that the applicant show that insofar as documents, information, and materials are involved, he can meet the special requirements of any of the countries that might subsequently import the aircraft. On the other hand, once a special export certificate of airworthiness is issued, the holder of the certificate has the responsibility under other provisions of the regulations to forward to the air authority of the importing country the documents, information, and material specified in the special requirements of that country.

For the foregoing reasons, the Agency considers it appropriate to amend section 21.339 to make it clear that an applicant for a special export certificate of airworthiness need only show that he has the documents, information, and material necessary to meet the special requirement of each of the prospective importing countries.

In addition, the present provisions of paragraph (5) relate to the holders of export airworthiness approvals rather than applicants for such approvals. Since substantially the same requirements are contained in section 21.335, which sets forth the responsibilities of exporters receiving an export airworthiness approval, the requirements of paragraph (5) are unnecessary under section 21.339 and have been deleted.

Finally, the present format of section 21.339 has been corrected consistent with the format of related sections of the regulations, and the cross reference to "section 21.32" has been changed to "section 21.327" to correct a typographical error.

Since this is a clarifying amendment and imposes no additional burden on any person, notice and public procedure hereon are unnecessary and the amendment may be made effective on

less than 30 days' notice.

In consideration of the foregoing, section 21.339 of Part 21 of the Federal Aviation Regulations is amended, effective October 22, 1966.

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421 and 1423).

Amendment 21-12

Issuance of Class II Provisional Type Certificates and Provisional Amendments to Type Certificates to Foreign Manufacturers

Adopted: October 10, 1966 Effective: October 15, 1966

(Published in 31 F.R. 13387, October 15, 1966)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to allow certain foreign manufacturers of aircraft to apply for and obtain Class II provisional type certificates and provisional amendments to type certificates. The objective of the regulation is to provide a means whereby air carriers can obtain as much experience as possible with foreign manufactured aircraft which, although safe for flight, have not been approved for the issuance of a type or amended type certificate.

This action was published as a Notice of Proposed Rule Making (31 F.R. 5969, April 19, 1966) and circulated as Notice 66-14 dated April 11, 1966. All of the comments received in response to the Notice expressed agreement with the objective of the proposal and supported the change. However, the comments also recommended additional changes as discussed below.

Expressing concern over deletion of the requirement that the 100-hours flight time for prototype aircraft must have been under an experimental certificate or under a Class I provisional airworthiness certificate, one commentator recommended that some provision be made to assure that the foreign country of manufacture has prototype requirements at least equivalent to U.S. standards. As the Notice stated, applicants for Class II provisional type certificates are limited to those foreign manufacturers who manufacture aircraft in a country with which the United States has an agreement for the acceptance of those aircraft for export and import. Moreover, since an applicant for a provisional certificate must have applied for a type certificate, the prototype requirements for the aircraft are governed by the provisions of section 21.29. Under that section,

a foreign country must certify that the foreign manufactured aircraft has been examined, tested and found to meet the airworthiness requirements of the Federal Aviation Regulations or the airworthiness requirements of the foreign country and any other requirements the Administrator may prescribe to provide a level of safety equivalent to that provided by the Federal Aviation Regulations.

For the foregoing reasons, the Agency does not believe that added regulatory provisions are necessary to assure that the country of manufacture has prototype requirements at least equivalent to U.S. standards.

Another commentator, citing an exemption granted under the predecessor section of proposed section 21.85(d), stated its belief that the requirement for the FAA's flight test program to be in progress as a prerequisite for provisional amendment to a type certificate is unwarranted. The commentator then recommended that consideration be given to making that section compatible with the requirement for issuance of a Class II provisional type certificate.

Insofar as the requirements concerning the existence of a flight test program are concerned, the proposal merely added a clause recognizing that for foreign manufactured aircraft the flight test program would be identified as the program of the foreign country and not necessarily the FAA flight test program. Therefore, the recommendation to delete the requirement that a flight test program must be in progress at the time of the issuance of a Class II provisional type certificate or a provisional amendment to a type certificate goes beyond the scope of the Notice. Moreover, contrary to the commentator's position, an examination of the Notice in this matter reveals that the requirement concerning the existence of a flight test program is the same for the issuance of a Class II provisional type certificate as for the issuance of a provisional amendment to a type certificate.

Interested persons have been afforded the opportunity to participate in the making of this amendment. All relevant material submitted has been fully considered.

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations is amended effective October 15, 1966.

This amendment is made under the authority of sections 313(a), 601 and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423).

Amendment 21-13

Identification of Aircraft, Aircraft Engines, and Propellers

Adopted: January 3, 1967 Effective: July 7, 1967

(Published in 32 F.R. 187, January 10, 1967)

This amendment changes Part 21 to require compliance with the identification plate requirements of Part 45 as a prerequisite to the issue of certain airworthiness certificates, and changes Part 45 to broaden the pertinent identification plate requirements for aircraft, aircraft engines, and propellers. This amendment also removes appliances from Part 45. This amendment is based on, and is issued for the reasons contained in, Notice 66-15, published in the Federal Register on April 19, 1966 (31 F.R. 5991). Changes to the proposals in the Notice, and disposition of industry comments, are as follows.

One comment objected to proposed new Section 21.182 because it would not require an aircraft altered under a Supplemental Type Certificate (STC) to have a changed or additional identification plate containing any new information related to the STC'd aircraft and that the identification plate on an STC'd aircraft should not continue to identify the modified aircraft with only the builder's name, serial number, and model designation pertaining to the holder of the type or production certificate. The Agency disagrees. The identification plate has but one function: It is a means by which the Agency can positively link a given aircraft with the proper documentation so that the continuing airworthiness history of that particular aircraft can be traced throughout its service life. The burden placed on the public by the identification plate requirements should be no greater than that necessary to fulfill this function. So far as linking a particular aircraft to its proper documents is concerned, it should be noted that, while the name of the builder is essential information on the original plate (for aircraft built under a type or production certificate as well as for aircraft built from spare and surplus parts), it is not necessary to require that the builder's name on the plate be changed or that new names be added to include persons who subsequently modify the aircraft under STC's. These later modifications will be reflected in the pertinent documents. These documents can be located and traced by the information on the original plate.

Several comments concerned the location of the aircraft identification plate. The proposed section would have only required the plate to be in an "accessible external location." In the light of several comments received, the Agency has determined that a reasonably uniform location should be adopted, since the main purpose of the location aspect of the identification plate requirements is to facilitate identification of the aircraft during inspections or in an accident. Therefore,

this amendment requires the aircraft's identification plate to be in an accessible location "near an entrance." An external location is not required. An "accessible location near an entrance" should allow the maximum amount of protection for the plate in an accident while at the same time leaving the plate available for normal inspection.

Two comments concerned the proposed "permanent" nature of the identification plates for aircraft and for aircraft engines. The comments indicated that the Agency might want the plates removed for alteration or replacement, and that, if they were permanent in nature, this would be an impossibility. The Agency agrees. Literal permanence is not intended. This amendment (Section 45.11(a)) therefore merely requires that identification plates for both aircraft and aircraft engines be secured so that they "will not be likely to be defaced or removed during normal service, or lost or destroyed in an accident." Consistent with this change, the propeller identification requirements are amended (in Section 45.11(b)) by deleting the reference to "permanent" identification, and by replacing that reference with (1) a reference to a "fireproof" identification, and (2) a requirement that the marking be such that it "will not be likely to be defaced or removed during normal service, or lost or destroyed in an accident."

One comment stated that proposed Section 21.182 would require a new identification plate each time the airworthiness classification is changed. The Agency assumes that this concern is caused by the proposed language "each applicant...must identify his aircraft as prescribed..." This result is not intended. Section 21.182 therefore is changed from the Notice by specifically excluding changes of already identified aircraft from one airworthiness classification to another. Further, the Agency does not believe it necessary to require the applicant to actually perform the identification. Section 21.182 therefore only requires that the applicant "show that the aircraft is identified as prescribed in Section 45.11(a)."

One comment suggested that Section 45.11(a) should require that the marking on the fireproof plate that is affixed to aircraft and aircraft engines should also be fireproof. This change has been incorporated into the rule. A fireproof plate without fireproof markings would have limited identification value.

One comment recommended that the identification plate for aircraft engines be placed on the main case. The rule requires that the engine's identification plate be accessible, and not easily damaged. It is true that, on some engines, the main case might be an accessible location. However, it need not be so for every engine. Therefore, rather than fix a uniform location, it is more practical to require only that the plate be accessible. This comment cannot, therefore, be accepted.

One comment suggested that the serial numbers shown on the aircraft's identification plate should be correlated with the type design, rather than with its model number. The commentator stated that this would avoid duplication of model and serial numbers, creating an ambiguity between aircraft that are not built under a type or production certificate, and those that are. The Agency recognizes the fact that there might be duplication of serial numbers, since this amendment does not require persons who build aircraft from spare and surplus parts to determine and avoid using all serial numbers assigned to all past, present, and future aircraft of that model by the holder of the type or production certificate. Further, as indicated in the Notice, the regulation would require persons who build aircraft from spare and surplus parts to list the model designation under the type design to which conformity will be shown. The aircraft's model number will thus be duplicated in arriving at the finding of conformity. However, notwithstanding these serial number and model designation duplications, no ultimate identification ambiguity should result under this amendment. Section 45.13(a)(1) requires the builder's name to appear on the plate. In most cases the builder's name alone will distinguish aircraft not built under a type or production certificate from aircraft that are so built. In addition, Section 45.13(a)(5) requires the production certificate number, if any, to appear on the plate. Thus, even if two or more builders of the same model aircraft should duplicate serial numbers, no ambiguity will result unless all of the builders have the same name and none of them hold production certificates. The probability of this is low enough to justify not accepting this comment. However, if ambiguities should arise in this connection, some further means of distinguishing between aircraft built under a type certificate or production certificate, and other aircraft, will be made.

Another comment questioned the need to include the date of completion of the product on the identification plate, as provided by the proposed amendment to Section 45.13(a)(4). The

Agency accepts this comment both as to the date of completion and as to the date of manufacture (which was required by Section 45.13(a)(4) prior to this amendment). Amended Section 45.13(a)(3) requires every builder to give his aircraft a serial number, and place it on the aircraft's identification plate, whether or not the aircraft is built under the terms of a type or production certificate. Except for antique aircraft, the date of manufacture can be readily discovered through the serial number of the aircraft. A requirement for this date to appear on the identification plate would therefore appear to be unnecessary. For antique aircraft the age of the aircraft can generally be determined from the manufacturer's records, or from the original airworthiness certificate. If the aircraft is one for which no records are available, the Agency will have to use collateral evidence to fix the date of manufacture. However, the expected

frequency of this occurrence is too low to require the date of completion to be on each identification plate. In **SUMMARY**, it does not appear that the possible presence or absence of a serial number or the likelihood of deterioration as a result of aging are useful standards for determining whether the date of manufacture (or completion) should be furnished. In light of the comments received, the amendment to Section 45.13(a)(4), as it appeared in the Notice, is withdrawn, and the requirement of former Section 45.13(a)(4) is deleted. Subsequent subparagraphs are renumbered accordingly.

A comment suggested that the rule be revised to eliminate the requirement that the manufacturer number his aircraft in the sequence of production. This amendment does not prescribe any particular pattern or sequence of assigned numbers.

The Agency appreciates the cooperative spirit in which these comments were submitted by the public.

In consideration of the foregoing, Parts 21 and 45[1] are amended as follows effective July 7, 1967.

These amendments are issued under the authority of Sections 307(c), 313(a), 601 and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1348(c), 1354(a), 1421 and 1423).

Amendment 21-14

Export Airworthiness Approval Procedures

Adopted: February 10, 1967 Effective: February 16, 1967

(Published in 32 F.R. 2999, February 17, 1967)

The purpose of this amendment to section 21.325 of the Federal Aviation Regulations (FAR's) is to remove the restriction on the issuance of export airworthiness approvals for new, small airplanes (those having a maximum certificated takeoff weight of 12,500 pounds or less) that are type certificated under Part 4a of the Civil Air Regulations (CAR's).

As pertinent here, section 21.325(b)(1) states that export airworthiness approvals may be issued for an airplane type certificated under Part 23 and manufactured under a production certificate without that aircraft having been assembled and flight tested.

The export airworthiness approval regulations were originally proposed as part of the Civil Air Regulations. At that time it was determined that small, type certificated airplanes manufactured under a production certificate, as

[1] Part 45 is published separately.

distinguished from large, complex airplanes, could be excepted from the general assembly and flight-test conditions on which the approvals were to be based. However, since there were no small airplanes type certificated under Part 4a of the Civil Air Regulations then in production, the exception was considered only in terms of small airplanes type certificated under Part 3 of the Civil Air Regulations. Moreover, since the rules governing export airworthiness approvals did not become effective until after Part 3 of the Civil Air Regulations had been recodified as Part 23 of the Federal Aviation Regulations, the exception from the assembly and flight-test requirements was stated as applicable to FAR Part 23 airplanes.

It now appears that at least two small airplanes type certificated under Part 4a of the Civil Air Regulations are currently in production. In this connection, Champion Aircraft Corporation, a manufacturer of such an airplane, has petitioned for an amendment to section 21.325(b)(1) to permit the issuance of an export airworthiness certificate for aircraft type certified under Part 4a of the Civil Air Regulations and manufactured under a production certificate without the necessity of having to assemble and flight-test the aircraft.

As previously indicated, at the time that the current regulation was under consideration, there was no need to refer to airplanes type certificated under Part 4a. Nevertheless, the reasons for excepting new airplanes type certificated under Part 23 and manufactured under a production certificate from the assembly and flight-test requirements are equally applicable to new Part 4a airplanes manufactured under a production certificate. Therefore, in view of the current production activity with respect to small airplanes type certificated under Part 4a, it is considered appropriate to amend the regulation as requested.

Since this amendment removes an unnecessary restriction and imposes no additional burden on any person, notice and public procedure hereon are unnecessary and the amendment may be made effective on less than 30 days' notice.

In consideration of the foregoing, section 21.325(b)(1) of the Federal Aviation Regulations is amended, effective February 16, 1967.

This amendment is made under the authority of sections 313(a), 601 and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421 and 1423).

Amendment 21-15

Miscellaneous Powerplant Design Requirements for Aircraft Engines and Propellers

Adopted: February 24, 1967 Effective: April 3, 1967

(Published in 32 F.R. 3733, March 4, 1967)

This amendment adds miscellaneous powerplant design requirements for aircraft engines and propellers, and withdraws certain proposals for rotorcraft. This amendment is based on, and reflects industry comments concerning, Notice of Proposed Rule Making 66-3, published in the Federal Register (31 F.R. 2485) on February 8, 1966. Except as modified by the following discussion, the reasons for this amendment are those in the Notice. Changes from the Notice, and Agency disposition of industry comments, are as follows.

As proposed in the Notice, Part 21 is amended to make editorial changes consistent with the new definitions of engine power or thrust values in terms of "ratings". No substantive change results. The Notice proposed to delete section 33.13 and section 35.15 since section 21.21 contains similar general language concerning unsafe features of engines and propellers. One comment objected, stating that repetition may be beneficial in this case. The Agency disagrees. Experience has shown that repetition of legal requirements can lead to misunderstanding and uncertainty on the part of the users of the regulations. Other comments stated that sections 33.13 and 35.15 should not be deleted because type certification standards (as opposed to procedural requirements) should be located together in one document for each product (Parts 33 and 35, respectively), and that sections 33.13 and 35.15 also contain testing requirements not in section 21.21. The Agency agrees. This amendment therefore accomplished the intent of the Notice by eliminating the surplus requirement with respect to engines and propellers in section 21.21 rather than by deleting the similar provision in Parts 33 and 35.

In consideration of the foregoing, Subchapters A (Part 1[2]) and C (Parts 21, 33, and 35*) of Chapter I of Title 14 of the Code of Federal Regulations are amended, effective April 3, 1967.

These amendments are issued under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423).

Amendment 21-16

Crashworthiness and Passenger Evacuation Standards; Transport Category Airplanes

[2] Parts 1, 33, And 35 are published separately.

Adopted: September 15, 1967 Effective: October 24, 1967

(Published in 32 F.R. 13255, September 20, 1967)

The purpose of these amendments is to improve the emergency evacuation equipment requirements and operating procedures for transport category airplanes.

These amendments are based on a notice of proposed rule making (31 F.R. 10275, July 29, 1966), circulated as Notice No. 66-26 dated July 26, 1966, and on a supplement to notice of proposed rule making (31 F.R. 11725, Sept. 7, 1966), circulated as Notice No. 66-26A dated September 2, 1966.

Numerous comments were received in response to Notice 66-26 and supplemental Notice 66-26A. Based upon these comments and upon review within the FAA, a number of changes have been made to the proposed rule. Most of these changes involve rewording and reorganization for greater clarity and consistency. However, certain substantive changes have been made to the proposed regulation that do not require compliance for periods of from 1 to 2 years. While all but a few of these changes fall within the scope of Notice 66-26 and 66-26A, interested persons have not been given the opportunity to comment on the details of the requirements. The issuance of a supplemental notice of proposed rule making to solicit comments upon these was considered. However, comments from the public on the original notices and from within the FAA indicated that the further delays attendant to this course of action would not be in the best interest of those concerned. Consequently, the FAA is issuing a final rule to allow the persons affected by these regulations to proceed with the certification or retrofitting of their airplanes without further delay. Thereafter, the FAA will consider comments on the changes referred to above received from interested persons on or before October 24, 1967, and may further amend the regulations in the light of these comments. The FAA believes that this course of action is justified and is in the best interest of the public.

The amendments incorporated herein are aimed at increasing substantially the probability of occupant survival in an aircraft accident. The FAA will consider additional revisions of the regulations, as advances in the state-of-the-art allow, in order to further increase that probability of survival. To this end,

Government and industry development programs have been established to devise new techniques, designs, and equipment. In progress now are developments on: More effective self-extinguishing characteristics for aircraft interior materials; cabin fire suppressant systems; protection from smoke and fumes; gelled fuels; improved emergency lighting and exit conspicuity; and improved evacuation facilities and techniques.

The final amendments and the more pertinent of the comments received in response to the notices are set forth hereinafter.

Part 21

Sections 21.17 and 21.101 are amended as proposed to accommodate the special retroactive requirements incorporated by new Section 25.2.

In consideration of the foregoing, Parts 21, 25, 37, and 121 of the Federal Aviation Regulations are amended effective October 24, 1967.

(Secs. 313(a), 601, 603, and 604 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1424))

Amendment 21-17

Conformity of Products to Their Type Designs

Adopted: October 23, 1967 Effective: January 26, 1968

(Published in 32 F.R. 14925, October 28, 1967)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to specify the showing of conformity to type design data that must be made before an aircraft or part thereof may be presented for type certification tests, and to set forth the requirements applicable to the issuance of a standard airworthiness certificate for certain aircraft not built under a type or production certificate.

This amendment is based on a Notice of Proposed Rule Making (Notice 66-21) published in the Federal Register on June 8, 1966 (31 F.R. 8075).

One of the comments received in response to the Notice expressed concern that the proposed change to Section 21.33(a) might be interpreted as requiring that all aircraft presented for a flight test must completely conform to the type design. It was pointed out that under present practice, aircraft that do not fully conform to the type design but which, to the satisfaction of all FAA personnel involved, sufficiently conform to achieve the necessary test results and which have been determined by the FAA to be safe for flight, may be tested.

While complete conformity is, of course, desirable, the FAA recognizes that conformity to all the type design data at any given point during a test program may not be possible in all cases. Therefore, the proposed regulation expressly provided for deviations where authorized by the Administrator. This is consistent with the present practice and assures that the FAA is

made aware of the extent to which an aircraft or part thereof does not conform to the submitted type design data prior to testing.

Contrary to the views expressed in one of the comments, the proposed change to Section 21.33(a) is not directed to manufacturers producing aircraft under type or production certificates. The proposal is concerned with conformity of aircraft prior to testing during the type certification program and not with the conformity of production aircraft. Moreover, there is no change to the present procedures governing the approval of engineering changes and drawings by a Designated Engineering Representative (DER) during type certification intended under this amendment.

Another comment concerned the proposal to delete the word "flight" in Section 21.33(a) to make it clear that each applicant must allow the Administrator to make any tests, ground or flight, necessary to determine that an aircraft meets the applicable requirements. In this connection, it was suggested that rather than delete the word "flight" it would be more appropriate to refer to both "flight" and "ground" tests. The FAA sees merit in this suggestion and the proposal has been changed accordingly.

One of the comments received questioned the need for the amendments concerning the statements of conformity on the grounds that the present FAA Form 317 contains the same detail as that proposed. However, contrary to this commentator's understanding, the present FAA Form 317 does not contain all the details concerning statements of conformity proposed in Notice 66-21. Moreover, even though the FAA Form 317 has been revised to accommodate the proposal, the FAA considers that the requirements concerning the statements of conformity should be set forth in the FARs.

Numerous comments were received objecting to the proposed amendment to Section 21.183 in the belief that it was designed to change the present requirements concerning the certification of modified "surplus military helicopters". These comments invariably requested the retention of the present rules insofar as the airworthiness certification of such surplus military aircraft is concerned. As expressly pointed out in the preamble to Notice 66-21, it is not the intent of the FAA to change the regulations governing the airworthiness certification of aircraft which were used in military service and later released for civil use. Surplus military aircraft are currently covered under Section 21.183(d) and the proposal would merely redesignate paragraph (d) as paragraph (e) without any change to the substantive provisions of that paragraph. On the other hand, the FAA did propose to add a new paragraph (c) to Section 21.183 applicable to aircraft built from spare and surplus parts. Such aircraft are currently being certificated in accordance with the broad provisions of paragraph (d) of Section 21.183 which merely

requires evidence that the aircraft conform to a type design. However, since aircraft built from spare and surplus parts may, in many cases, be built entirely outside of any approved system designed to ensure conformity, the FAA believed that the industry should have the benefit of a more definitive regulation when applying for certification of such aircraft. For this reason, a new paragraph (c) was proposed describing in detail the kind of

evidence needed to show conformity of an aircraft built from spare and surplus parts to a type design. This proposal was issued in the belief that aircraft built from spare and surplus parts are sufficiently definable as a class to differentiate them from the other aircraft covered under the proposed new paragraph (e). However, such is not the case. From the comments received in response to the Notice, it is apparent that considerable confusion exists concerning the applicability of the proposed new paragraph (c), particularly with respect to aircraft obtained as surplus from the military, but modified for commercial use by the incorporation of spare and surplus parts. For the foregoing reasons, the FAA is aware that adoption of this aspect of the proposal would not be appropriate at this time. However, as the Notice pointed out, the FAA is currently administering the detailed procedures set forth in the proposal under the broad requirements of paragraph (d) of the present rule. There was no intent to change these detailed procedures and since, as the Notice stated, they are necessary to provide the same degree of assurance of conformity to approved type design data as is now provided for aircraft individually produced under a type certificate only, they will continue to be administered in appropriate cases under the requirements of paragraph (d).

In addition to the foregoing, the provisions of paragraphs (a) and (b) of Section 21.183 are amended as proposed to make it clear that they apply to newly manufactured aircraft. Paragraph (a) is also amended to make it clear that the Administrator's power to inspect the aircraft is not limited to inspections for conformity to type design but includes inspections to determine condition for safe operation. Paragraph (b) is also amended as proposed to make it clear that the statement of conformity referred to is the same statement of conformity prescribed in Section 21.130 and, as such, must be submitted by the holder or licensee of the type certificate.

As proposed in the Notice, Section 21.53 required each applicant for a type certificate to submit a statement of conformity for each aircraft presented to the Administrator for tests. On the other hand, the proposal also required an applicant for a supplemental type certificate (STC) to meet Section 21.53 with respect to each change in the type design. Thus, the proposal could be read as requiring that an applicant for an STC must, with respect to each and every change in the type design of an aircraft, submit a statement of conformity for the entire aircraft. This was not intended by the FAA, and the

requirements of Section 21.53 have been changed to make it clear that the statement of conformity is required for each aircraft or part thereof presented to the Administrator for tests.

In response to comments received, the requirements set forth with respect to import aircraft have been changed to refer to "standard" airworthiness certificates rather than "original" airworthiness certificates to make them consistent with the other requirements of that section.

In connection with the proposal to amend the supplemental type certification (STC) requirements, one comment expressed the opinion that the proposed rules would prohibit changes to an aircraft between the time that the statement of conformity governing the STC modification is submitted and the time that the appropriate tests are performed. Actually, the proposal is concerned only with changes between the time that a showing of compliance with the appropriate design data is shown and the time the aircraft is presented for tests. Under the proposal, the statement of conformity need not be submitted until the time for conducting the necessary tests has been established. Therefore, there need not be any appreciable lapse of time between the submission of the statement of conformity and the date the FAA tests are conducted.

Other minor changes of an editorial or clarifying nature have been made. They are not substantive and do not impose an additional burden on any person.

Interested persons have been afforded the opportunity to participate in the making of this amendment. All relevant material submitted has been fully considered.

This amendment is made under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423).

NOTE: The recordkeeping and reporting requirements contained herein have been approved by the Bureau of the Budget in accordance with the Federal Reports Act of 1942.

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations is amended effective January 26, 1968.

Amendment 21-18

Delegation Option Authorization

Adopted: November 1, 1967 **Effective: November 1, 1967**

(Published in 32 F.R. 15472, November 7, 1967)

The purpose of this amendment is to clarify Part 21 of the Federal Aviation Regulations with respect to the authority of delegation option manufacturers to issue airworthiness certificates.

Present section 21.273(a) limits a manufacturer holding a delegation option authorization to the issuance of standard airworthiness certificates for aircraft produced by him under his authorization. The word "standard" was inadvertently incorporated into section 21.273(a) during the adoption of Amendment 21-5 to the delegation option procedures. The provisions of section 21.251 covering the limits of applicability for delegation option authorizations contain no such limitation and the delegation option manufacturers have been issuing airworthiness certificates other than standard certificates for many years without any adverse effect on safety. For these reasons, the FAA considers it appropriate to correct the provisions of section 21.273(a) to make it clear that delegation option manufacturers are not limited to the issuance of standard airworthiness certificates.

Since this amendment is clarifying in nature and imposes no additional burden on any person, Notice and public procedure thereon are unnecessary and the amendment may be made effective immediately.

This amendment is made under the authority of sections 313(a), 314, 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1355, 1421, and 1423).

In consideration of the foregoing, section 21.273(a) of Part 21 is amended effective November 1, 1967.

Amendment 21-19

Issue of Special Conditions

Adopted: December 7, 1967 Effective: January 12, 1968

(Published in 32 F.R. 17850, December 13, 1967)

The purpose of these amendments is to clarify the status of special conditions issued during type certification of aircraft, aircraft engines, and propellers, and to prescribe the procedures for their issuance.

These amendments are issued for the reasons set forth in the Notice of Proposed Rule Making published in 32 F.R. 6098 on April 18, 1967, and circulated as Notice 67-16 dated April 12, 1967. The comments received in response to the Notice and the changes in the proposal resulting therefrom are discussed below.

In response to a comment on the Notice, sections 21.16 and 21.101 now refer to "adequate" safety standards rather than "complete" safety standards. The FAA agrees that this minor change is appropriate to remove any implication that special conditions are designed to raise the level of airworthiness for a product beyond the minimum which has been generally set by the applicable existing regulations. In addition, this proposal has been revised to make it clear that special conditions apply to a novel or unusual design feature not otherwise covered by the existing regulations.

The FAA, however, has not adopted a recommendation to revise the proposal to expressly state that the Administrator prescribe "minimum" special conditions. The FAA does not consider that this change is necessary since the regulation specifically provides that the Administrator prescribes such special conditions as may be necessary to establish a level of safety equivalent to that established in the existing airworthiness regulations.

Another comment stated that under present practice, the FAA and the manufacturer resolve, through negotiation, any problems that may arise from special conditions. The comment stated that the proposed rules should specifically recognize and provide for this need. In this connection it should be noted that the Administrative Procedure Act (APA) requires that all persons subject to a rule, such as a special condition, must be given notice thereof and an opportunity to participate in the rule making. As pointed out by the commentator, in the past special conditions have been developed only after extensive consultation with the interested persons. This informal procedure represents an effective and practical means of providing the notice and opportunity to participate that is required in rule-making actions by the APA and it will be continued. The proposal has been changed to expressly acknowledge that the manufacturer of a product is afforded the opportunity to participate in the formulation of special conditions applicable to his product. Moreover, for purposes of clarification, the final rule elaborates on the term "private rule" as used in the proposal by specifying that special conditions are issued to an applicant for a type certificate as rules of particular applicability for his product.

Finally, a suggestion was made that the proposal should also allow the Administrator to relieve an applicant from regulations deemed burdensome and not relevant in particular cases. While this comment is outside the scope of the proposal, it should, nevertheless, be pointed out that the suggested change is unnecessary. The current regulations governing type certification require compliance only with the applicable airworthiness regulations and expressly provide for noncompliance with any airworthiness regulation whenever equivalent safety is

provided. Irrelevant regulations are thus excluded from the certification basis for a product during the certification process. In some instances this has been reflected in special conditions.

Interested persons have been afforded the opportunity to participate in the making of these amendments. All relevant material submitted has been fully considered.

These amendments are issued under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423).

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended effective January 12, 1968.

Amendment 21-20

Issue of Airworthiness Certificates for Certain Normal, Utility, Acrobatic, and Transport Category Aircraft

Adopted: February 9, 1968 Effective: March 17, 1968

(Published in 33 F.R. 3054, February 16, 1968)

The purpose of this amendment to Section 21.183(d)(2) is to add performance standards, and permit more persons to qualify, with respect to the airworthiness inspection conducted on certain aircraft by private persons prior to the Administrator's inspection for the issue of an airworthiness certificate for such aircraft.

This amendment is based on a Notice of Proposed Rule Making (Notice 67-33) published in the Federal Register on July 28, 1967 (32 F.R. 11042).

Most comments supported the proposal. However, one commentator agreed provided the level of safety upon which this amendment is based is assured by including details for the 100-hour inspection for particular airplanes. As indicated in the provisions of Part 43, the detailed performance requirements set forth in that Part for the 100-hour inspection are sufficiently broad to provide a basis for determining that any aircraft inspected in accordance with those requirements is in an airworthy condition. Therefore, there should be no derogation of safety when inspections of the same scope are conducted under Section 21.183(d)(2). It should be noted that the inspection conducted under Section 21.183(d)(2) provides one source of information that the Administrator, after inspection, may use in making his determination, under Section 21.183(d)(3), as to whether the aircraft conforms to the type design and is in condition for safe operation. For this purpose, as stated in the

Notice, an inspection of the scope of a 100-hour inspection as outlined in Part 43 of the Federal Aviation Regulations would provide the necessary information.

One comment stated that a mechanic with airframe and powerplant ratings should not be permitted to perform the inspection under Section 21.183(d)(2) because he does not have the maintenance organization possessed by air carriers, manufacturers, or repair stations for conducting the required inspection. The FAA disagrees. Section 43.13(a) requires each person performing maintenance to use any tools, equipment, and test apparatus necessary to assure completion of the work in

accordance with accepted industry practice, including any special equipment recommended by the manufacturers (or its equivalent acceptable to the Administrator). This rule covers required inspections as well as other maintenance. The FAA has no reason to believe that this rule is not adequate for certificated mechanics conducting 100-hour inspections. This amendment simply incorporates the scope of the 100-hour inspection of Part 43 into the required inspection provisions of Section 21.183(d)(2). This comment cannot, therefore, be accepted.

With respect to certificated mechanics, the Notice proposed to limit the inspection privilege to mechanics who hold "both airframe and powerplant ratings." This would have prevented mechanics who hold only one of those ratings from conducting an inspection, of the scope of the 100-hour inspection requirements of Section 43.15, on that portion of the aircraft covered by their single rating. This exclusion would conflict with Sections 65.85 and 65.87, which together permit the holders of airframe ratings to perform 100-hour inspections on airframes and permit the holders of powerplant ratings to perform 100-hour inspections on powerplants, propellers, or any part thereof. Since this amendment simply incorporates the scope of the 100-hour inspection requirements of Part 43 into the required inspection provisions of Section 21.183(d)(2), there is no valid reason to require that a certificated mechanic must hold both ratings in order to perform the inspection prescribed under this amendment. Rather than referring to "both" ratings, new Section 21.183(d)(2)(iii) therefore simply refers to all holders of mechanic certificates "as authorized by Part 65 of this chapter" (which includes Sections 65.85 and 65.87).

One comment suggested that the rule be amended to permit the persons who make the airworthiness inspection to also conduct the conformity check required under Section 21.183(d)(1). While this comment goes beyond the scope of Notice 67-33, it will be given consideration for possible future rule-making action.

Interested persons have been afforded the opportunity to participate in the making of this amendment. All relevant material submitted has been fully considered.

In consideration of the foregoing, Section 21.183(d)(2) of Part 21 of the Federal Aviation Regulations is amended effective March 17, 1968.

These amendments are made under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421 and 1423).

Amendment 21-21

Special Airworthiness Certificates

Adopted: April 30, 1968 **Effective: June 6, 1968**

(Published in 33 F.R. 6856, May 7, 1968)

The purpose of these amendments is to provide for a classification of special airworthiness certificates that includes restricted, limited, provisional, and experimental certificates, and special flight permits; to expand the purposes for which experimental certificates may be issued to include market surveys, sales demonstrations and customer crew training operations; and to expand the purposes for which special flight permits may be issued. The general operating and flight rules are also amended to include operating limitations applicable to aircraft having experimental certificates.

These amendments are based on a Notice of Proposed Rule Making (31 F.R. 9131, July 2, 1966), circulated as Notice No. 66-24, dated June 27, 1966.

Numerous comments were received in response to Notice 66-24. Based upon these comments and upon further consideration by the FAA, a number of substantive changes have been made to the proposed rules. The comments received and the changes in the proposal resulting therefrom are discussed below.

In addition to the proposed regulations concerning special airworthiness certificates, Notice 66-24 contained detailed proposals setting forth comprehensive airworthiness standards for amateur-built aircraft. However, the comments received in response to the amateur-built aircraft rules were consistently opposed to the proposal. In the light of these comments and after further study by the FAA, it is apparent that detailed substantive changes to the proposed standards will be necessary in order to provide meaningful airworthiness standards for amateur-built aircraft. Therefore, the FAA intends to issue a new Notice of Proposed Rule Making proposing airworthiness standards for amateur-built aircraft taking into consideration the comments received on Notice 66-24. For this reason, those portions of Notice 66-24 dealing with the issuance of special type and airworthiness certificates for amateur-built aircraft

and proposing new airworthiness standards for such aircraft are withdrawn.

The proposal would also have changed the present

requirements concerning provisional airworthiness certificates to delete the provisions covering the issuance of Class I provisional type and airworthiness certificates. At the same time, it was proposed to permit market surveys and sales demonstrations under an experimental certificate. Comments received concerning this proposal indicate, however, that there are situations in which manufacturers would not want to conduct such operations in aircraft having experimental certificates. The comments suggest that the requirements for Class I provisional certificates should be retained and the manufacturer permitted to use either an experimentally certificated aircraft or a Class I provisionally certificated aircraft in conducting these operations. The FAA sees merit in this suggestion and the proposal has been changed accordingly. The comments also pointed out that customer crew training is permitted under a Class I provisional certificate and that this should also be permitted under an experimental certificate. The FAA intended to extend to manufacturers the same privileges under the experimental certificate as they have under the Class I provisional certificate. This privilege has been extended to manufacturers through numerous exemptions without any adverse effect on safety. The proposal has, therefore, been changed to expressly permit customer crew training by manufacturers under an experimental certificate.

As previously indicated, one of the objectives of Notice 66-24 was to provide for the classification of airworthiness certificates as either standard or special. In this connection, detailed amendments were proposed to the airworthiness certification provisions in Part 21 primarily for the purpose of classifying restricted and limited category airworthiness certificates, provisional and experimental airworthiness certificates and special flight permits, as special airworthiness certificates. The detailed changes, particularly with respect to format, proposed in Notice 66-24 to accommodate the new classification were considered appropriate in view of the extensive revisions to the regulations that were being made to implement the proposed new certification standards for amateur-built aircraft and to accommodate the proposed new provisional certification requirements. However, in view of the decision concerning these two matters as referred to above, and in the light of the numerous comments received in response to this Notice, the FAA does not consider that an amendment of the regulations to the extent proposed is necessary in order to accomplish the objective of the proposal with respect to special airworthiness certificates. In this connection, Section 21.175 covering the classification of airworthiness certificates has

been amended merely to indicate that airworthiness certificates

are classified as either standard or special and that special airworthiness certificates include airworthiness certificates issued for restricted, limited and provisionally certificated aircraft, experimental certificates and special flight permits. Thus, contrary to the proposal, the final rules do not contain amendments to the sections of Subpart H of Part 21 concerning the issue of airworthiness certificates for normal, utility, acrobatic and transport category aircraft; the issue of airworthiness certificates for restricted and limited category aircraft and the issue of multiple airworthiness certificates. Moreover, no changes are being made to the provisional airworthiness certification requirements. The only changes being made concern the issue of experimental certificates and special flight permits.

In Notice 66-24, the FAA proposed to change the requirement of Section 21.179 to provide that experimental certificates and special flight permits are not transferred with an aircraft. Several comments concerning this proposal pointed out the disadvantages in making such a restriction applicable generally to all experimentally certificated aircraft. The comments were particularly concerned with amateur-built aircraft. The proposed change was initiated in the belief that because of the operations covered by experimental certificates and special flight permits and the aircraft involved, each owner of the aircraft should identify his need for the certificate and show that the aircraft can be operated safely. However, it has subsequently been determined that the safety of operations in aircraft having experimental certificates and special flight permits is adequately covered by the limitations imposed under the current regulations, including the limitation on the duration of such certificates and permits and that the proposed restriction is unnecessary in the interest of safety.

In order to consolidate the provisions governing the duration of airworthiness certificates, the duration provisions applicable to experimental certificates presently set forth in Section 21.195 have been incorporated into Section 21.181. Finally, the purposes for which experimental certificates are issued as set forth in Section 21.191, have been expanded consistent with the proposal to permit market surveys, sales demonstrations and customer crew training as well as training of the applicant's flight crews to be conducted in experimentally certificated aircraft. However, while the proposal would have required the applicant for an experimental certificate for an aircraft to be used in market surveys, sales demonstrations and customer crew training operations to, among other things, show that the aircraft had been flown for at least 50 hours, in

response to comments received the proposal has been changed to require that the aircraft need have been flown for only 5 hours

if it is a type certificated aircraft which has been modified.

With respect to special flight permits, Notice 66-24 contained a proposal providing for the issue of special airworthiness certificates for those operations currently authorized under special flight permits. In this connection, production flight tests would have been authorized as an experimental purpose under a special airworthiness certificate and the other operations presently covered by special flight permits would have been authorized under a special airworthiness certificate for aircraft involved in ferry flights. Various comments were received concerning this proposal, particularly with respect to the fact that as proposed, production flight testing would have been identified as an experimental operation. This, of course, is not appropriate. Therefore, in the light of these comments and after further consideration, the FAA has determined that these changes are not necessary. However, as proposed, the requirements governing special flight permits now provide for the issuance of special flight permits for the purpose of evacuating aircraft from areas of impending danger and incorporate the proposed changes to the information required to be submitted by the applicant for a special flight permit.

A comment was also received concerning the provision in the Notice prohibiting the carriage of persons or property for compensation or hire in aircraft having a special airworthiness certificate. The comment stated that there is no justification, on the basis of safety, for prohibiting the carriage of property for compensation or hire. As set forth in Notice 66-24, the special airworthiness certificate classification covers restricted and limited category certificates, experimental certificates and special flight permits. In this connection, the Notice did not propose a new requirement but merely restated the current limitation on the carriage of persons or property for compensation or hire applicable to aircraft having such certificates. A general authorization to carry property for compensation or hire on aircraft certificated in the limited or restricted category or on aircraft having experimental certificates and special flight permits would be inconsistent with the limitations set forth in the special purpose for which those certificates may be issued and would require regulatory changes beyond the scope of Notice 66-24.

With reference to airworthiness certificates in general, various comments objected to the proposed requirement that applications for an airworthiness certificate be submitted to the

local FAA office. As the comments indicated, the FAA is aware that in some instances the "local" FAA office may not be as accessible to an applicant as the District Office of another Region. Therefore, to prevent unnecessary inconvenience in the submittal of applications, the FAA agrees with one of the comments that applications should be submitted to any FAA office and the rule has been changed accordingly. In addition, in response to comments, the proposal has been revised to take into

consideration the current practice of accepting telephone and telegraphic applications for special flight permits in emergency situations.

A proposal to change the requirements of Section 45.23 to require that aircraft having special airworthiness certificates display the word "special" near each entrance to the cabin or cockpit was also included in Notice 66-24. However, based on the numerous comments on this proposal and after further consideration, the FAA has determined that the proposed change would not accomplish the objective sought and could create confusion as to the nature of the aircraft. Therefore, Section 45.23 remains unchanged and limited, restricted, experimental or provisionally certificated aircraft must still display the words "limited", "restricted", "experimental" or "provisional airworthiness", as the case may be.

In light of the determinations concerning the proposed changes to Part 21, the only amendment to Part 91 now considered necessary is the proposed amendment setting forth operating limitations applicable to aircraft having experimental certificates. These operating limitations are set forth in new Section 91.42. In this connection, several comments were received objecting to the area restrictions proposed for aircraft having experimental certificates. The comments pointed out that the FAA recently amended Part 91 to delete the requirements concerning "approved" flight test areas and that there appears to be no reason for requiring operation in "approved" areas under the proposed rule. The operating limitations set forth herein are applicable to all aircraft having experimental certificates and not just aircraft involved in flight tests. The FAA considers that all aircraft having experimental certificates must, in the interest of safety, be operated in an area assigned by the Administrator until it is shown that the aircraft is controllable throughout its normal range of speeds and throughout all the maneuvers to be executed and it is shown that the aircraft has no hazardous operating characteristics or design features. After the required showing has been made, if the aircraft is to be flight tested it would be governed by the flight test requirement of Section 91.93 or if the aircraft is to be used for any of the other purposes for which an aircraft having an experimental certificate may be used, it would be governed by any area limitations particularly related to that purpose imposed by the FAA. The area restriction set forth herein has for a number of years been included in each experimental certificate issued by the FAA.

With reference to experimental certificates and special flight permits, one of the comments pointed out that the Notice made no provision for the renewal of expired certificates. The commentator recommended that the regulations either be changed to provide that experimental certificates remain in effect as long

as maintenance is performed in accordance with Parts 43 and 91 of the Federal Aviation Regulations or to specify requirements applicable to the renewal of such certificates. In this connection, it was recommended that an experimental certificate should be renewed when the applicant has submitted (1) a statement that the aircraft is to be operated for one or more of the experimental purposes and, (2) upon inspection of the aircraft by the Administrator, any other information necessary for the purpose of prescribing operating limitations. In most cases, Part 43 of the Federal Aviation Regulations is not applicable to aircraft having experimental certificates and this is pointed out in the applicability section of that Part. Therefore, the duration of experimental certificates cannot be predicated on compliance with the maintenance requirements of Part 43. However, since under the current regulations, experimental certificates remain in effect for no longer than one year, there appears to be merit in the recommendation for regulations covering the renewal of such certificates and the FAA plans to give the commentators recommendation further consideration with a view to appropriate regulatory action.

In Notice 66-24, it was proposed to change the current regulations by restricting the issuance of experimental certificates for aircraft to be used for air racing to those air races which are officially sanctioned. However, in the light of the comments on this proposal and after further consideration, the FAA does not consider that the proposed requirement is necessary in the interest of safety. Any participant in an air race must comply with the air traffic and general operating rules set forth in Part 91 of the FARs regardless of whether that air race is sanctioned by the organizations referred to in the Notice. Moreover, the FAA is not aware that operations conducted under the current requirements have had any adverse effect on safety. For this reason the proposed restriction has not been adopted.

A number of comments were received concerning the absolute prohibition on the operation of aircraft having experimental certificates with respect to populated areas and congested airways. The comments pointed out that the proposed operating limitations would severely curtail current operations with aircraft having experimental certificates since the base of operations may be an airport in a populated area used for private and commercial operations. The FAA considers that the comment has merit and that an appropriate revision of the proposed requirement may be made without any adverse effect on safety. In this connection, the proposal has been changed to prohibit aircraft having experimental certificates from being operated over densely populated areas and in congested airways, except for takeoffs and landings conducted in accordance with special operating limitations issued by the Administrator. This provides the necessary relief and parallels the limitation on the

operation of restricted category aircraft currently set forth in the regulations. In addition, the proposed operating limitations have been revised to make it clear that notice of the experimental nature of the aircraft is required only when operating into and out of airports with operating control towers. While there were comments objecting to this limitation, the FAA believes that the traffic controller should be made aware of the experimental status of an aircraft so that special instructions with regard to the usage of runways or approach patterns can be applied if necessary in the interest of safety.

Interested persons have been afforded an opportunity to participate in the making of these amendments. All relevant material submitted has been fully considered.

In consideration of the foregoing, Parts 21 and 91[3] of the Federal Aviation Regulations (14 CFR Parts 21 and 91) are amended, effective June 6, 1968.

These amendments are issued under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423).

Amendment 21-22

Issuance of Special Flight Permits with Continuous Authorization to Conduct Ferry Flights

Adopted: August 15, 1968 Effective: September 21, 1968

(Published in 33 F.R. 11900, August 22, 1968)

The purpose of these amendments to Parts 21 and 91 of the Federal Aviation Regulations is to provide for issuance by the Administrator of special flight permits with continuing authorization to conduct ferry flights, for specified purposes, to an air carrier or commercial operator of large aircraft certificated under Part 121 or an air carrier engaged in scheduled operations with helicopters certificated under Part 127.

These amendments are based on a Notice of Proposed Rule Making published in the Federal Register on October 25, 1967 (32 F.R. 14775). Interested persons were afforded an opportunity to participate in the rule making through submission of written comments. Due consideration has been given to all relevant matter presented.

Comment received in general supported the proposed amendments, since they afford a savings in time and paper work and contribute to the efficient utilization of equipment.

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[3] Part 91 is published separately.

The Air Line Pilots Association (ALPA) was opposed to the proposed amendments on the grounds that the operation of unairworthy airplanes compromised safety and therefore was not in the public interest. The objection of the ALPA extended to the issuance of individual special flight permits as well as issuance of special flight permits with continuing authorization to conduct ferry flights.

Permitting the flight of aircraft which may not currently meet with all applicable airworthiness requirements for the purpose of accomplishing necessary maintenance or alterations is a practice of long standing, and FAA experience with this practice does not indicate that safety has been compromised. It is the judgment of the FAA that such flights are frequently advantageous and may be safely conducted under carefully selected operating conditions and appropriate restrictions.

The Air Transport Association of America (ATA) expressed general agreement with the proposal and recommended certain changes. It suggested that including the flight permit and continuing authorization, together with conditions and limitations, in the certificate holder's operations specifications would greatly expand their volume, and that requiring those portions of the operation specifications to be carried in the aircraft under Section 91.27 would be unnecessarily burdensome. ATA further recommended that scheduled helicopter operators certificated under Part 127 be included as eligible under Section 21.197 since they have similar problems and situations requiring the ferry of aircraft for maintenance or alterations. The latter recommendation is viewed as appropriate and Section 21.197 has been broadened to apply to Part 127 certificate holders as well as Part 121 certificate holders.

It is not felt that the proposed requirement for carrying applicable sections of the operations specifications abroad the aircraft would be unduly burdensome. The FAA statement of the permit with continuing authorization, together with a listing of general conditions and limitations imposed by the Administrator is expected to be brief, and should normally require no more than the addition of a single page in the operations specifications. More detailed conditions and limitations considered necessary by the permit holder to meet specific contingencies would normally be contained in operations manuals or maintenance manuals, or in the permit holder's communication which directs or authorizes the flight. However, in order to provide for greater flexibility, the requirement has been stated in the alternative in Section 91.27, allowing the permit holder to carry either the operations specifications or portions of the air carrier manual required by Section 121.133 or Section 127.61 containing a restatement of the permit and those conditions and limitations imposed by the Administrator in the operations specifications.

The ATA recommendation that the special flight permit and continuing authorization be stated originally in the air carrier manual required under Section 121.133 rather than the operations specifications has not been adopted. While a restatement of the conditions and limitations in operations and maintenance manuals will contribute to a workable arrangement, it is believed the operations specification is the appropriate place for the original statement of the special flight permit with continuing authorization, and for the original listing of general conditions and limitations for flight. The certificate holder, in restating conditions and limitations for flight in the air carrier manual, may find it convenient or necessary to supplement the listing with more detailed statements of procedures and restrictions.

It is anticipated that an advisory circular or internal FAA directive, or both, will be issued to facilitate and standardize issuance of the permits.

In consideration of the foregoing, Parts 21 and 91 of the Federal Aviation Regulations are amended effective September 21, 1968.

These amendments are made under the authority of Sections 313(a), 601 and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1345(a), 1421 and 1423).

Amendment 21-23

Critical Rotorcraft Components

Adopted: September 10, 1968 Effective: October 17, 1968

(Published in 33 F.R. 14104, September 18, 1968)

The purpose of these amendments to Parts 21, 27, 29, 43, 45, 91 and 127 of the Federal Aviation Regulations is to (1) permit rotorcraft manufacturers to adopt failsafe fatigue design practices for certain portions of the flight structure on condition that related fatigue crack detection procedures and inspection intervals are approved under the required fatigue evaluation as part of the type design and placed in a separate section of the rotorcraft maintenance manual, (2) require that the replacement times of certain critical components be similarly approved and placed in the separate section of the maintenance manual, (3) require that this section of the manual be referenced by placard in the rotorcraft, and (4) specifically require operators and maintenance personnel to comply with this section of the maintenance manual. The amendments will also require manufacturers to make certain revisions of the rotorcraft maintenance manual available to operators and require identification of certain critical components.

These amendments are based on a Notice of Proposed Rule Making (Notice No. 67-44) published in the Federal Register on October 11, 1967 (32 F.R. 14106).

A number of comments were received in response to Notice No. 67-44, most of which were in agreement with the proposal. The more pertinent of the comments that raised questions together with the changes in the proposal resulting therefrom are discussed hereinafter.

In view of the new sections that were proposed, one commentator suggested that existing Sections 27.307(a) and 29.307(a) be clarified by indicating that the structural analysis used in connection with proof of structure, be permitted to be either static or fatigue. The FAA agrees that such a change would more fully express the intent of the rule yet not imply a change in past practice in which fatigue evaluation has generally involved testing. The sections have been amended accordingly.

As previously stated in the preamble of the Notice, the standards of new Sections 27.571, 29.571, 27.1529 and 25.1529 are intended to preserve the design objectives stated in Notice 65-42, Airframe Proposal 8, except for clarifying changes.

One commentator stated that use of the word "component" in the proposed Sections 27.571(a) and 29.571(a) could be interpreted as meaning that the entire fuselage, for example, and most of its elements are critical so that a formal fatigue evaluation would be required to be performed on each frame, stringer, panel, or combination. However, since not all parts of a flight structure, such as the fuselage, are likely to be critical in fatigue, it was suggested that the requirement be clarified to call for evaluation only of those considered critical. The FAA is in substantial agreement for it was not intended to require detailed evaluation of a portion of the structure for which no significant fatigue loading exists. The paragraph has been amended, therefore, to delete the word "component" and indicate that it is the critical portion of the flight structure that must be identified and evaluated. A further recommendation that the paragraph be amended to be applicable to failures which "would" be catastrophic rather than those which "could" be catastrophic has been rejected since this would imply that doubtful areas need not be included in the fatigue evaluation. In connection with the requirement for fatigue evaluation of flight structure, it was suggested that the intent be clarified so as not to extend the fatigue evaluation to non-critical parts. While the FAA agrees with the objective of this comment, it is believed that the revisions to Section 27.571(a) and Section 29.571(a) discussed above sufficiently delineate the applicability without introducing the new term "noncritical".

As they were proposed, Sections 27.571(a)(3)(i) and 29.571(a)(3)(i) indicated that loads and stresses need be subjected to inflight measurement only throughout the range

expected in operation where such range is less than the range of design limitations stated in Sections 27.309 and 29.309. It is apparent that such a generally stated alternative is at variance with other requirements inasmuch as design weight, rpm, airspeeds, and c.g. limits are attainable without extreme maneuvers and are, in general, explored in other phases of the flight test program. With maneuvering load factors, the situation is otherwise, however, and since it would be unrealistic in connection with fatigue evaluation to require measurement of loads and stresses at the limit maneuvering load factors, the alternative of using operational rather than design limits would there be applicable. To remove any ambiguity with reference to weight, rpm, airspeed, and c.g. limits, Sections 27.571(a)(3)(i) and 29.571(a)(3)(i) have been reworded to make it clear that it is for only maneuvering load factors that inflight measurements may be made with reference to values expected in operation.

The FAA agrees with a comment that the intent of Sections 27.571(d)(2) and 29.571(d)(2) is to distinguish the lesser of the limit and maximum attainable loads rather than designate one as being applicable. The parenthetical expression in the two sections has been amended to state "whichever is less".

Pointing out that some procedures are so simple and well known that actual demonstration should not be required, one commentator objected to the requirement that all procedures in the "Airworthiness Limitations" section of the Rotorcraft Maintenance Manual be shown to be practicable. Since the need for an actual demonstration should be determined on an individual basis, the requirement for a showing has been eliminated in Sections 27.1529(a)(2)(ii) and 29.1529(a)(2)(ii).

One of the comments received in response to the Notice requested that the FAA specifically countermand the "administrative procedures" specified in the preamble. In this connection, the commentator referred to the preamble discussions in which the FAA indicated that if safety requires that the airworthiness limitations in the Rotorcraft Maintenance Manual must be made more severe, appropriate changes to the manual would be made by airworthiness directives. While the comment objected to the general use of airworthiness directives, it did indicate acceptance of telegraphic airworthiness directives for use in this regard.

As pointed out in the preamble to Notice 67-44, the inspection intervals, replacement times and related procedures set forth in the "Airworthiness Limitations" section of the Rotorcraft Maintenance Manual are limitations on the original approval of the type design. Thus, any changes to these limitations are, in effect, changes to the type design. In recognition of this fact, airworthiness directives have long been used by the FAA to prescribe changes to the service life limits for a product. However, it should be made clear that since the replacement times, inspection intervals, etc., would now be

placed in a maintenance manual, the manufacturer's changes to the manual and subsequent dissemination to all operators would serve the purpose originally served by airworthiness directives. However, as the FAA pointed out in the preamble discussions, in those instances where a safety necessity exists, the airworthiness directive is the means by which the FAA can assure that the operators have the revised limitations. Moreover, an airworthiness directive would also be required in those instances in which a manufacturer failed to issue revisions to the limitations which the FAA considered necessary in the interest of safety. Only in the latter instance would the FAA make changes to the manual by airworthiness directive. As the commentator correctly noted, approved revisions to the airworthiness limitations section of the maintenance manual have had the same legal effect as the original limitations and the issuance of airworthiness directives with respect to such limitations would not be inconsistent with that fact.

The FAA agrees with one final suggestion that service experience may be used in certain instances in a resubstantiation of the flight structure, as, for example, for a relaxation of a replacement time or inspection interval in the "Airworthiness Limitations" section of a Rotorcraft Maintenance Manual. It must be recognized, of course, that time extensions for parts, the failure of which would be catastrophic, cannot be based solely on failure rates or absence of failures in service. However, it is intended to permit appropriate use of service experience in reevaluating flight insurance in accordance with Sections 27.571 and 29.571. In this connection, laboratory tests might be made on parts that have been used in service to determine whether the original assumptions were overly conservative.

Interested persons have been afforded an opportunity to participate in the making of this amendment, and due consideration has been given to all matter presented.

In consideration of the foregoing, Parts 21, 27, 29, 43, 45, 91, and 127[4] of the Federal Aviation Regulations are amended effective October 17, 1968.

This amendment is made under the authority of Sections 313(a), 601, 603, 604, and 605 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425).

Amendment 21-24

Designation of Applicable Regulations for Type Certificates

Adopted: January 3, 1969 **Effective: February 9, 1969**

(Published in 34 F.R. 363, January 10, 1969)

[4] Parts 27, 29, 43, 45, 91, and 127 are published separately.

The purpose of these amendments to Part 21 of the Federal Aviation Regulations is to clarify the provisions regarding the designation of applicable regulations for the issuance of type certificates (TCs).

These amendments are based on a notice of proposed rule making (32 F.R. 17455, December 6, 1967), circulated as Notice No. 67-52, dated November 29, 1967. Numerous comments were received in response to the Notice. The FAA's disposition of these comments are set forth hereinafter.

One of the comments received stated that the substantive effect of removing the parenthetical exclusion for restricted category, import and surplus military aircraft from Section 21.17(a) is unclear and requested that this proposal be withdrawn. As pointed out in the preamble to Notice 67-52, the removal of the parenthetical statement from Section 21.17(a) will have no substantive effect on the type certification of the aircraft mentioned in that statement. The parenthetical exclusion merely emphasizes the fact that there are other provisions in the regulations for restricted category, import, and surplus military, aircraft which contain specific requirements concerning the airworthiness standards applicable to such aircraft. This emphasis is unnecessary, however, since Section 21.17(a) already excepts an applicant for a type certificate from meeting the applicable airworthiness requirements effective on the date of application in those cases where the Administrator has specified otherwise by regulation. In this connection, specific requirements concerning the airworthiness standards applicable to restricted category, import and surplus military aircraft are set forth in Sections 21.25, 21.29 and 21.27 respectively. Moreover, in addition to being unnecessary, the parenthetical exclusion of restricted category, import and surplus military aircraft has also created some confusion as to the applicability of paragraphs (b) and (c) of Section 21.17 to such aircraft. Therefore, the FAA considers it appropriate to amend the regulation as proposed and delete the parenthetical statement presently contained in Section 21.17(a).

Another comment urged that the five-year limitation for certification of transport category aircraft be applied to nontransport aircraft as well. The commentator points out that some of the small aircraft of today are more complex than the transports of earlier years and more complex than some current large aircraft. While this is true, the majority of the small aircraft being built today are less complex than the aircraft being certificated in the transport category. Experience with the three-year limitation indicates that it is satisfactory as a rule of general applicability for small aircraft. On the other hand, the FAA considers that it has adequately covered the very complex small aircraft by providing for the approval of a longer type certification period upon a showing that additional time is needed.

Under the current regulations, applications for type certificates are effective for three or five years, depending upon the category of aircraft involved. In Notice 67-52, it was proposed to amend Section 21.17(b) to permit longer periods if the applicant shows at the time of application that his product requires a longer period of time for design, development and testing. One of the comments objected to this proposal, stating that a period longer than the present three or five years should not be granted. The commentator stated that if a manufacturer needs extensions of the time to complete certification, such extensions should stipulate that all possible interim airworthiness requirements would be required for final certification. The FAA does not agree with this comment since it would, in effect, require the applicant for a type certificate to show compliance with the airworthiness requirements in effect on the date of issue of the type certificate. Such a requirement would be impractical. The FAA recognizes that a manufacturer must freeze his design at some point in order to establish and maintain production. It is unrealistic to expect a manufacturer to continuously incorporate the changes in its type design dictated by all amendments to the regulations that occur up to the date of certification. In those cases where safety requires that a technological advance be incorporated into an aircraft design prior to certification, the FAA has taken, and will in the future take, appropriate regulatory action to assure that this is done. However, for the purpose of the initial designation of the regulations applicable to the certification of a product, the FAA has determined that for some of the new complex aircraft and the ultralarge aircraft it may not be possible to complete certification within the prescribed three or five year periods. For this reason, the manufacturers must be given the opportunity to establish a realistic certification period on the basis of the complexity and size of the aircraft.

It was also recommended that proposed Section 21.17(b) be changed to permit the applicant for a type certificate to show at any time prior to the expiration of the effective periods presently specified in the regulations, as well as at the time of application, that a longer type certification period is required. Proposed Section 21.17(b) is premised on the consideration that an applicant for a type certificate will have established a firm program for the design, development, and testing of his product at the time of application and will, therefore, know at that time whether a longer certification period will be necessary. This is consistent with the current regulations which, because of the established three and five year effective periods make it necessary that a manufacturer have an established program for the design, development, and testing of his product at the time of application. If, under the current regulations, unforeseen circumstances arise after the date of application that necessitate a longer period for certification, the manufacturer is required to comply with later regulations. There is no intent to change this concept by this proposal. Therefore, the proposed regulation has not been changed as recommended. However, it should be noted that to some extent the change recommended by

this comment is already reflected in the proposed regulation. In this connection, this amendment permits an applicant for a type certificate to file for an extension of his application within the period originally established for type certification and to show compliance with regulations that have an effective date later than the requirements originally imposed, but not as late as required by the current regulations.

A final comment with respect to Section 21.17 recommended that the proposal should be changed to require manufacturers to comply with the applicable portions of the operating rules in effect at the time of the type certification of a product. The substantive change involved in this recommendation is, of course, outside the scope of Notice 67-52. However, it should be pointed out that since all airworthiness requirements that are appropriate for inclusion on an aircraft during the type certification process are incorporated into the appropriate airworthiness parts of the regulations at the same time that they are added to the operating rules, an aircraft will comply with all such regulations that are in effect at the time of the application for the type certificate. A different situation exists with respect to those airworthiness requirements that are made effective subsequent to the date of application for the type certificate, but prior to the date of issuance of the type certificate. For the reasons previously set forth in this preamble, the safety regulations have not required that all airworthiness standards adopted subsequent to the date of

application for a type certificate be applied to an aircraft in the process of obtaining a type certificate. The regulations have, however, always provided for such an application when specified by the Administrator and, in appropriate instances, the FAA has taken regulatory action to require that existing airworthiness requirements adopted subsequent to the date of application for a type certificate be applied to an aircraft as a condition to the issuance of that certificate. The FAA considers that this is the proper procedure for dealing with the matter of retroactive application of airworthiness regulations. Since there are airworthiness requirements that are related to specific operations and are not, therefore, properly a condition to the issuance of a type certificate for an aircraft, the application of airworthiness requirements should be determined on a case-by-case basis.

With respect to import products, the FAA also proposed to amend Section 21.29(a) to provide for the type certification of an import product previously granted a foreign airworthiness approval. It was proposed to permit such certification if the country of manufacture certified that the product met the applicable airworthiness requirements of the foreign country of manufacture and any other requirements prescribed by the Administrator to provide a level of safety equivalent to that provided by the applicable U.S. regulations that were in effect

at the time of the original foreign airworthiness approval. At the time that Notice 67-52 was issued, the FAA was involved in the difficult process of type certificating a few old foreign aircraft, such as the Tiger Moth, under the current Section 21.29. The proposed change to Section 21.29 was intended to accommodate the certification of these older foreign aircraft because of their intrinsic value as antiques. It was thought that only a few people would be interested in the type certificate of foreign aircraft under the proposal. However, the proposal contained no limitations as to the size or the age of aircraft that could be certificated thereunder and it now appears that there are many large aircraft of foreign manufacture that would be available for import into the United States under this regulation. Moreover, the FAA now realizes that such aircraft could be used in air carrier and related operations. For this reason, and after further consideration, the FAA does not consider that the proposed change to Section 21.29 would be in the public interest and it is withdrawn.

Interested persons have been afforded an opportunity to participate in the making of these amendments. All relevant material submitted has been fully considered.

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations is amended, effective February 9, 1969.

This amendment is made under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of Section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-25

Type Certification and Approval

Adopted: August 28, 1969 Effective: October 5, 1969

(Published in 34 F.R. 14067, September 5, 1969)

The purpose of these amendments to Part 21 is to clarify the requirements governing the certification of import aircraft and approval of imported materials, parts, and appliances, and, to require a certification of conformity for each engine and propeller by the foreign country of manufacture.

These amendments are based on a notice of proposed rule making (Notice No. 68-27) published in the Federal Register on October 31, 1968, (33 F.R. 16005). The comments received in response to this notice indicated concurrence with the proposed rules. Therefore, except as specifically discussed hereinafter, these amendments and the reasons therefor are the same as those contained in Notice 68-27.

In Notice 68-27, it was proposed to amend section 21.130 to require the holder or licensee of a type certificate for foreign aircraft engines and propellers manufactured in a foreign country to furnish with each product imported into the United States, a certification by the country of manufacture similar to the statement of conformity that is required for such products manufactured domestically. This requirement would apply to engines and propellers manufactured in a country with which the United States has an agreement for the acceptance of those products for export and import. Upon further consideration, however, it has been determined by the FAA that while this proposed amendment is appropriate, it should not be included in section 21.130. Section 21.130 comes under Subpart F which governs the production of products under a type certificate only. That subpart contains regulations that are not applicable to aircraft, aircraft engines and propellers manufactured in a foreign country. It is therefore considered appropriate to place the requirement for a certification of conformity for foreign manufactured aircraft engines and propellers in a new Subpart N of the regulations dealing with the approval of import products in general. In this connection, the proposed change to section 21.307, dealing with approval of import materials, parts, and appliances is also included in this new subpart.

In addition, it is also considered appropriate to make it clear that the certification by the foreign country which is required to be furnished with each import aircraft engine, propeller, material, part, and appliance is the certificate of airworthiness for export referred to in the bilateral agreements with the various countries. This regulation merely reflects the past practice with respect to products, materials, parts, and appliances imported from the bilateral countries.

Editorial changes have been made to the proposed amendment of section 21.130 to accommodate the fact that proposed paragraph (b) is now included in a new section of Part 21. In addition, section 21.130 now reflects the proper approval tag form number.

Interested persons have been afforded an opportunity to participate in the making of this amendment, and due consideration has been given to all matter presented.

In consideration of the foregoing, Part 21 of the Federal Aviation Regulations is amended, effective October 5, 1969.

These amendments are issued under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423) and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-26

Deletion of Reference to FAA Form Numbers

Adopted: September 22, 1969 Effective: September 30, 1969

(Published in 34 F.R. 15243, September 30, 1969)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to clarify section 21.173 and to delete from that section references to obsolete FAA Forms.

Amendment 21-21 (33 F.R. 6856) published in the Federal Register on May 7, 1968, amended Part 21 of the FARs to establish the new classification of special airworthiness certificates. As a result of this change, FAA Forms 305 and 1779, presently referred to in section 21.173, are now obsolete. In view of the fact that the FAA form numbers are constantly subject to change, it is not considered appropriate to refer to such numbers in the regulations. Instead, this amendment merely requires that an application be made in a form and manner prescribed by the Administrator. This is consistent with various other application requirements in the FAR's.

In addition to the foregoing, section 21.173 has been amended to make it clear that airworthiness certificates are issued only for U.S.-registered aircraft. Since the registered owner of a U.S.-registered aircraft must be a citizen of the United States, the additional requirement that he must be a United States citizen is unnecessary and the regulation has been amended accordingly.

Since this is a minor, clarifying amendment that imposes no additional burden on any person, I find that notice and public procedure hereon are unnecessary and that it may be made effective in less than 30 days.

In consideration of the foregoing, section 21.173 of Part 21 of the Federal Aviation Regulations is amended, effective September 30, 1969.

This amendment is issued under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423) and of Section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-27

Miscellaneous Amendments

Adopted: November 3, 1969 Effective: December 1, 1969

(Published in 34 F.R. 18355, November 18, 1969)

This amendment was made in conjunction with the issuance of Part 36. A complete explanation of this amendment is contained in the preamble to that Part.

(Amended sections 21.17(a), 21.21(b) and (b)(1), 21.29, 21.31(c), 21.33(b)(1), 21.93, 21.101(a).)

Amendment 21-28

Special Flight Authorizations for Foreign Civil Aircraft, Conditions and Limitations

Adopted: February 5, 1970 Effective: March 13, 1970

(Published in 35 F.R. 2818, February 11, 1970)

The purpose of these amendments is to establish conditions and limitations under which special authorizations may be issued for foreign civil aircraft operated in the United States for market sales or surveys, and to delete the requirement that U.S. aircraft engine manufacturers use only type certificated engines in type certificated aircraft when operated solely for market surveys, sales demonstrations, or customer crew training.

These amendments are based on a notice of proposed rule making (Notice 69-35) which was published in the Federal Register on August 16, 1969 (34 F.R. 13329).

All of the comments received in response to Notice 69-35, with the exception of one, concurred without reservation in the adoption of these amendments. It should be pointed out that under these amendments, section 91.28(b)(5)(i) does not prevent U.S. manufacturers from marketing foreign civil aircraft. These amendments allow foreign civil aircraft to be flown for market sales or surveys without regard to whether or not the operator is the same person as the applicant. Therefore, a U.S. manufacturer may operate the aircraft under the authorization without being the applicant.

As amended, section 21.195(b) permits U.S. aircraft engine manufacturers to conduct market surveys and the other operations specified in the regulation with a type certificated aircraft, whether or not the engines are type certificated. In addition, minor editorial word changes have been made in paragraph (b) for purposes of clarification.

Interested persons have been afforded an opportunity to participate in the making of these amendments, and due consideration has been given all relevant matter presented.

In consideration of the foregoing, Parts 21 and 91 of the Federal Aviation Regulations are amended, effective March 13,

1970.

These amendments are issued under the authority of sections 313(a), 601, 603, and 610(b) of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1430(b)) and section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-29

Reporting Requirements for Manufacturers; Failures, Malfunctions, and Defects

Adopted: February 11, 1970 Effective: April 2, 1970

(Published in 35 F.R. 3154, February 19, 1970)

The purpose of these amendments to the Federal Aviation Regulations is to require manufacturers to report certain failures, malfunctions, or defects in the products or articles which they manufacture.

This action is based on the notice of proposed rule making set forth in Notice 69-12 and published in the Federal Register (34 F.R. 5441) on March 20, 1969.

Numerous comments have been received in response to Notice 69-12. While the majority of the comments were generally in favor of the proposed regulations, a number of comments recommended changes in specific provisions of the proposal. These comments are discussed in more detail hereinafter. There were also a few comments requesting that the proposal be withdrawn. While these comments are very general in nature, they appear to be primarily concerned with the belief that the proposed regulations are unnecessary and that the proposed system would not accomplish the stated objectives. The FAA, however, does not agree. Contrary to the opinion expressed in these comments, there are no current regulations that provide all the information covered under the proposal. While there may be other systems for obtaining the necessary failure, malfunction, or defect data that would be as effective as the system proposed, they are not apparent to the FAA at this time.

There were many comments objecting to the reporting time limit proposed in Sections 21.3 and 37.17. These comments were in general agreement that a 4-hour notification limit is unreasonably short since it would not permit the manufacturer time in which to investigate and adequately evaluate a failure, malfunction, or defect which has been "reported" to him. After further consideration, the FAA agrees. A manufacturer, prior to reporting to the FAA a failure, malfunction, or defect, should first confirm its occurrence and determine its effects through a preliminary investigation and analysis. Therefore, the final rule reflects the concern of these commentators and the

notification period prescribed in Sections 21.3 and 37.17 is extended to twenty-four (24) hours.

Several comments were received which questioned the meaning of the words "imminent hazard to flight." It appears that these commentators are primarily concerned with the word "imminent" and with the difficulty in administering such a requirement. The FAA appreciates the concern expressed in these comments. As one commentator correctly indicated, the Notice related the information concerning failures, malfunctions, and defects which the FAA proposed to require the manufacturers to furnish, to the same such information the air carriers are currently required to report. Thus, the manufacturers should report any failure, malfunction, or defect that could result in a hazard to flight, without the necessity of deciding whether the hazard is an "imminent" one. The final rule has been revised accordingly.

In the light of the various comments and after further consideration, the FAA has decided that it would not be appropriate to prescribe a form on which manufacturers would be required to report under Sections 21.3 and 37.17. The FAA now considers that the manufacturers should report in the most expeditious manner using any method of communication available to them.

Comments were also received suggesting that the FAA should not be notified of a failure, malfunction, or defect until after the problem is solved, or until after the customer has been notified by the manufacturer. Another commentator recommended that the proposal be withdrawn and that there be closer liaison between the FAA and the manufacturers rather than regulations. The purpose of the proposal as expressed in Notice 69-12, is to provide the FAA with the earliest possible notification of failures, malfunctions, or defects in order that the FAA may take appropriate mandatory action, such as the issuance of an Airworthiness Directive. The FAA has no desire to alter existing manufacture-customer relationships and closer liaison with manufacturers has always been sought by the FAA. However, neither of these recommendations provide a substitute for the proposed regulation.

Several commentators pointed out that many persons holding operating certificates under Parts 121 and 127 also hold STC's and TSO authorizations. They point out that these persons would be required to report the same failure, malfunction, or defect under both the operating rules and the proposed regulation and that this dual reporting requirement is unnecessary. The FAA agrees with this comment. Moreover, the same would apply to persons holding operating certificates under Part 135 as a result of Amendment 135-12 (34 F.R. 19130). Therefore, the final rule provides that failures, malfunctions, or defects already reported under Sections 21.3 or 37.17 need not be reported under Sections 121.703, 127.313, or 135.57. A similar provision for manufacturers holding domestic repair station certificates was proposed in Notice 69-12 and the same relief has been provided in

the final rule (by amendment to the foreign repair station regulations) to cover U.S. manufacturers holding foreign repair station certificates.

Finally, there was a comment from a foreign type certificate holder stating that the regulation is not clear as to the agency to whom foreign holders must report. The comment indicated that it would be contrary to accepted practice to report to the FAA directly and that reporting is usually accomplished through their national regulatory authorities. The FAA agrees. There are existing means by which the FAA obtains the necessary information regarding failures, malfunctions, or defects for foreign manufactured parts and products from the appropriate authorities in the country of manufacture. The FAA does not consider that it is necessary or appropriate to apply the proposed rule to foreign manufacturers at this time.

In consideration of the foregoing, Parts 21, 37, 121, 127, 135, and 145 of the Federal Aviation Regulations are amended, effective April 2, 1970.

These amendments are made under the authority of sections 313(a), 601, 603, 604, and 607 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1427), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655 (c)).

Amendment 21-30

Reporting Requirements for Manufacturers; Failures, Malfunctions, and Defects. Extension of Effective Date

Adopted: March 24, 1970 Effective: March 24, 1970

(Published in 35 F.R. 5319, March 31, 1970)

The purpose of this amendment is to extend to July 2, 1970, the effective date of the recently adopted regulation requiring manufacturers to report certain failures, malfunctions, or defects in the products or articles which they manufacture.

On February 11, 1970, the FAA adopted Amendments 21-29; 37-19; 121-58; 127-15; 135-15; and 145-9 and these amendments were published in the Federal Register on February 19, 1970, to become effective April 2, 1970. However, by letter dated March 4, 1970, the General Aviation Manufacturers Association, Inc., (GAMA) has requested a postponement of the effective date for at least 90 days. GAMA states that while the effect of the rule is still being studied and plans to meet the reporting requirements are being processed, such cannot be completed within the 28 working days allotted. The FAA agrees that some manufacturers may not be able to establish the necessary procedures and to assemble the necessary staff by April 2, 1970, and that

justification exists for extending for effective date to July 2, 1970.

Since this amendment is an extension of the effective date of a new requirement and imposes no additional burden on any person, I find that notice and public procedure thereon are unnecessary and that good cause exists for making this amendment effective on less than 30 days notice.

In consideration of the foregoing, the effective date of Amendments 21-29; 37-19; 121-58; 127-15; 135-15; and 145-9 published in the Federal Register (35 F.R. 3154) on February 19, 1970, is extended to July 2, 1970.

This amendment is issued under the authority of sections 313(a), 603, 604, and 607 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-31

Delegation Option Authorization: Issuance of Experimental Certificates

Adopted: May 4, 1970 **Effective: June 8, 1970**

(Published in 35 F.R. 7292, May 9, 1970)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to expand the purposes for which experimental certificates may be issued by the holder of a Delegation Option Authorization.

This amendment was proposed in Notice No. 69-49 issued on November 8, 1969 (34 F.R. 18094). All the comments received in response to the notice favored the adoption of the amendment. However, upon further review the FAA considers it appropriate to make it clear that the purposes stated in the proposal for which a Delegation Option Authorization manufacturer may issue experimental certificates apply only to the aircraft for which the manufacturer has applied for a type certificate or an amended type certificate. The proposal has been changed accordingly.

In consideration of the foregoing, paragraph (b)(4)(i) of Section 21.251 of Part 21 of the Federal Aviation Regulations is amended to read as follows, effective June 8, 1970.

This amendment is made under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(c), 1421, and 1423) and Section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-32

Issue of U.S. Airworthiness Certificates for Restricted Category Import Aircraft

Adopted: June 15, 1970 **Effective: June 23, 1970**

(Published in 35 F.R. 10201, June 23, 1970)

The purpose of this amendment to section 21.185 of Part 21 of the Federal Aviation Regulations (FAR's) is to provide for the issuance of airworthiness certificates for foreign manufactured aircraft that are type certificated in the restricted category under section 21.29 of the FAR's and imported into the United States.

Section 21.29 provides for the issuance of a U.S. type certificate for an aircraft that is manufactured in a foreign country with which the United States has an agreement for the acceptance of these products for export and import and that is to be imported into the United States. In general, these agreements with the various foreign countries extend to civil aircraft of all categories, and the FAA has recently issued a restricted category type certificate under section 21.29 for an airplane manufactured in a foreign country. However, section 21.185 of the FAR's, which governs the issue of airworthiness certificates for restricted category aircraft, clearly does not take into consideration aircraft type certificated under section 21.29 in the restricted category only. This has created no problem in the past, since the FAA has not previously been requested to type certificate on import aircraft in the restricted category only. However, in view of the recent type certification action under section 21.29 for an airplane that has never been type certificated by the United States in any other category, a clarifying amendment to section 21.185 is necessary to further implement the existing agreements with the various foreign countries by providing for the issuance of airworthiness certificates for import aircraft type certificated in the restricted category only.

For the foregoing reasons, and since the amendment imposes no additional burden on any person, I find that notice and public procedures thereon are unnecessary and that good cause exists for making this amendment effective in less than 30 days.

In consideration of the foregoing, section 21.185 of Part 21 of the Federal Aviation Regulations is amended, effective June 23, 1970, by adding a new paragraph (c).

This amendment is made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423) and section 6(c) of the Department

of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-33

Reporting Requirements for Manufacturers; Failures, Malfunctions, and Defects. Extension of Effective Date

Adopted: June 26, 1970 Effective: June 26, 1970

(Published in 35 FR 10653, July 1, 1970)

The purpose of this amendment is to extend to October 2, 1970, the effective date of the recently adopted regulation requiring manufacturers to report certain failures, malfunctions, or defects in the products or articles which they manufacture.

On February 11, 1970, the FAA adopted Amendments 21-29; 37-19; 121-58; 127-15; 135-15; and 145-9 and these amendments were published in the Federal Register to become effective April 2, 1970. The effective date was subsequently extended to July 2, 1970, at the request of the General Aviation Manufacturer's Association, Incorporated, to enable manufacturers to establish procedures and to assemble the staff needed to comply with the new regulations (Amendments 21-30; 37-20; 121-59; 127-16; 135-16; and 145-10, 35 FR 5319, March 31, 1970). I have determined that there is a need for a further extension of the effective date of the new regulations for an additional 90 days.

Since this amendment is an extension of the effective date of a new requirement and imposes no additional burden on any person, I find that notice and public procedure thereon are unnecessary and that good cause exists for making this amendment effective on less than 30 days' notice.

In consideration of the foregoing, the effective date of Amendments 21-29; 37-19; 121-58; 127-15; 135-15; and 145-9

published in the Federal Register (35 FR 3154) on February 19, 1970, is extended to October 2, 1970.

This amendment is issued under the authority of Sections 313(a), 603, 604, and 607 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-34

Production Under Type Certificate

Adopted: August 11, 1970 Effective: August 15, 1970

(Published in 35 F.R. 13008, August 15, 1970)

The purpose of this amendment to Part 21 is to authorize an extension of the period within which products may be manufactured under a type certificate only without establishing an approved production inspection system.

Present section 21.123(c) requires a manufacturer to establish an approved production inspection system for products manufactured more than 6 months after the date of issue of the type certificate for that product. This 6-month limitation has proven to be impracticable for products which are in limited or infrequent production and for licensees and transferees of type certificates that were issued more than 6 months prior to the licensing agreement or transfer.

Since this amendment removes an unnecessary restriction and imposes no additional burden on any person, the FAA finds that notice and public procedures on this amendment are unnecessary and that good cause exists for making it effective on less than 30 days' notice.

In consideration of the foregoing, section 21.123(c), Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended, effective on publication in the Federal Register.

This amendment is made under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and Section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-35

Reporting Requirements for Manufacturers; Failures, Malfunctions, and Defects. Extension of Effective Date

Adopted: September 28, 1970 Effective: September 29, 1970

(Published in 35 FR 15288, October 1, 1970)

The purpose of these amendments is to further extend the effective date of Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9 to the Federal Aviation Regulations which require manufacturers to notify the FAA of any failure, malfunction, or defect in any product, part, or article manufactured by them that could result in a hazard to flight

Amendments 21-29, 37-19, 121-58, 127-15, 135-15 and 145-9 were published in the Federal Register on February 19, 1970 (35 FR 3154) to become effective April 2, 1970. The effective date was first extended to July 2, 1970, by Amendments 21-30, 37-20, 121-59, 127-16, 135-16, and 145-10 (35 FR 5319, March 31, 1970)

and later extended to October 2, 1970 by Amendments 21-33, 37-22, 121-63, 127-18, 135-19, 145-11 (35 FR 10653, July 1, 1970).

Subsequently, however, it has come to the attention of the FAA that some of the reporting requirements set forth in Amendments 21-29, 37-19, 121-58, 127-15, 135-15 and 145-9, are ambiguous and may also require duplicate reporting of certain failures, malfunctions and defects. For these reasons, the FAA considers it necessary to clarify the reporting requirements and to remove any requirement that could result in duplicate reporting. It is contemplated that the amendments necessary to accomplish the foregoing will be issued in the very near future.

In view of the foregoing and the imminence of the October 2, 1970, effective date, the FAA has determined that there is a need for a further extension of the effective date of the new regulations.

Since this amendment is an extension of the effective date of a new requirement and imposes no additional burden on any person, I find that notice and public procedure thereon are unnecessary and that good cause exists for making this amendment effective on less than 30 days' notice.

In consideration of the foregoing, the effective date of Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9

published in the Federal Register (35 FR 3154) on February 19, 1970, is extended to November 30, 1970.

These amendments are issued under the authority of Sections 313(a), 603, 604, and 607 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425), and of Section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-36

Reporting Requirements for Manufacturers; Failures, Malfunctions, and Defects

Adopted: November 24, 1970 Effective: November 30, 1970

(Published in 35 FR 18187, November 28, 1970)

The purpose of these amendments to the Federal Aviation Regulations is to clarify and relax the reporting requirements for manufacturers and to revoke the amendments to Parts 21, 37, 121, 127, 135, and 145 of the Federal Aviation Regulations contained in Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9, published in the Federal Register on February 19, 1970 (35 FR 3154).

Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9,

effective April 2, 1970, require certain manufacturers to notify the FAA of any failure, malfunction, or defect in any product or part manufactured by them that could result in a hazard to flight. The effective date of those amendments was later extended to November 30, 1970, by Amendments 21-35, 37-25, 121-68, 127-20, 135-21, and 145-12, (35 FR 15288). Subsequently, however, it has come to the attention of the FAA that the reporting requirements are, in some instances, ambiguous and in certain areas may require duplicate reporting. Since Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9 do not become effective until November 30, 1970, the FAA considers it appropriate to clarify the regulations containing the reporting requirements for manufacturers and to remove any requirement that could result in duplicate reporting before those regulations become effective. These changes are discussed hereinafter.

The requirements of Sections 21.3 and 37.17 require a holder of a type certificate (including a supplemental type certificate), or a Parts Manufacturer Approval (PMA), or a TSO authorization, or the licensee of a type certificate, to notify the FAA within 24 hours after it discovers or is informed of a failure, malfunction, or defect in any product or part manufactured by it, of any such failure, malfunction, or defect that could result in a hazard to flight. Several interested persons have recently advised the FAA that this requirement is ambiguous, since any failure, malfunction, or defect, including the failure of a single rivet, could result in a hazard to flight. Thus, they contend, the manufacturers would have to report all failures, malfunctions, and defects. The FAA is aware that this would defeat the purpose of the regulation. Therefore,

it is considered appropriate to clarify the regulation by listing the particular occurrences which constitute a hazard to flight for the purpose of reporting requirements and by requiring the reporting of a failure, malfunction, or defect only after it has been determined that such failure, malfunction, or defect has resulted in any of the listed hazards to flight. The requirements of Sections 21.3 and 37.17 have also been revised to make it clear that where a manufacturer determines that there is a defect in any product, part or article that it manufactures that would result in any of the listed hazards to flight, the manufacturer need only report the defect if any of the defective products, parts or articles have left its quality control system.

The FAA is also aware that requiring a manufacturer to report failures, malfunctions and defects which it "discovers or is informed of" could result in the reporting of unconfirmed occurrences. Such reports would be of no value to the FAA. Therefore, the provisions of Sections 21.3 and 37.17 have been revised so that manufacturers need report only failures, malfunctions, and defects which they have determined have resulted or would result in any of the listed hazards.

In addition to the foregoing, the requirements of Sections 21.3 and 37.17 have been relaxed to make them consistent with

similar reporting requirements in the operating rules. In this connection, special late reporting provisions have been added covering reports that would be due on Saturday, Sunday, or a holiday.

Finally, the regulation has been revised to eliminate additional areas where duplicate reporting could occur. Thus, reports need not be made of any failure, malfunction, or defect that the manufacturer knows has already been reported by another person under the Federal Aviation Regulations or that the manufacturer has already reported to the National Transportation Safety Board. Moreover, the FAA is not interested in a manufacturer's report on any failure, malfunction, or defect that is caused by improper maintenance or improper usage.

These amendments contain clarifications and relaxations of the rules that were adopted to become effective on November 30, 1970. They have been coordinated with representatives of the industry to the extent possible. However, in view of the imminent effective date of Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9, further notice and public procedure hereon is impracticable and good cause exists for making them effective on less than 30 days' notice.

In consideration of the foregoing:

1. The amendments to Parts 21, 37, 121, 127, 135, and 145 of the Federal Aviation Regulations contained in Amendments 21-29, 37-19, 121-58, 127-15, 135-15, and 145-9, and published in the Federal Register on February 19, 1980 (35 FR 3154) and Amendments 21-30, 37-20, 121-59, 127-16, 135-16, and 145-10, published in the Federal Register on March 31, 1970 (35 FR 5319) and Amendments 21-33, 37-22, 121-63, 127-18, 135-19, and 145-11, published in the Federal Register on July 1, 1970 (35 FR 10653) and Amendments 21-35, 37-25, 121-68, 127-20, 135-21, and 145-12, published in the Federal Register October 1, 1970 (35 FR 15288) are hereby revoked effective November 30, 1970; and

2. Parts 21, 37, 121, 127, 135, and 145 of the Federal Aviation Regulations are amended, effective November 30, 1970.

These amendments are made under the authority of sections 313(a), 601, 603, 604, and 607 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1427), and of Section 6(c) of the Department of Transportation Action (49 U.S.C. 1655(c)).

NOTE: The reporting and/or recordkeeping requirements contained herein have been approved by the Bureau of the Budget in accordance with the Federal Reports Act of 1942.

Amendment 21-37

Reporting Requirements for Manufacturers; Failures, Malfunctions, and Defects

Adopted: December 1, 1970 **Effective: December 4, 1970**

(Published in 35 F.R. 18450, December 4, 1970)

The purpose of these amendments to Parts 21 and 37 of the Federal Aviation Regulations is to permit the first report under sections 21.3 and 37.17 to be made after January 3, 1971.

As issued on November 24, 1970, effective November 30, 1970, (35 F.R. 18187) sections 21.3 and 37.17 require a holder of a type certificate (including a supplemental type certificate), or a Parts Manufacturer Approval (PMA), or a TSO authorization, or the licensee of a type certificate, to report to the FAA any failure, malfunction, or defect in any product manufactured by it that it determines has resulted in specified occurrences. The General Aviation Manufacturers Association, Inc. (GAMA) has requested that the FAA delay compliance with the reporting requirements for 30 days to permit the manufacturers time in which to establish the necessary procedures for compliance with those requirements. In view of the representations made by GAMA, the FAA agrees that the persons covered by sections 21.3 and 37.17 should not be required to make the first report until after January 3, 1971.

Since these amendments grant relief by extending the date for compliance with a new requirement and impose no additional burden on any person, I find that notice and public procedures hereon are not necessary, and these amendments may be made effective immediately.

In consideration of the foregoing, Parts 21 and 37 of the Federal Aviation Regulations are amended, effective December 4, 1970.

These amendments are made under the authority of sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-38

Replacement and Modification Parts

Adopted: May 19, 1972 **Effective: June 26, 1972**

(Published in 37 F.R. 10658, May 26, 1972)

The purpose of these amendments to Parts 21 and 45 of the Federal Aviation Regulations is to revise and clarify the requirements for the manufacturer of approved replacement and modification parts for sale for installation on a type certificated product.

These amendments are based on a Notice of Proposed Rule Making (Notice 69-36) issued on August 13, 1969, and published in the Federal Register on August 20, 1969 (34 F.R. 13421). Numerous comments were received in response to Notice 69-36 and the more pertinent of these comments are discussed below. Based upon these comments and upon further consideration by the FAA, a number of substantive and editorial changes have been made to the proposed rule. Interested persons have been afforded an opportunity to participate in the making of these amendments, and due consideration has been given to all relevant matter presented. Except as modified by the following discussion, the reasons for these amendments are those in the Notice.

One comment suggested that a Parts Manufacturer Approval (PMA) should not be required for the production of parts for altering or maintaining an agricultural or other special purpose aircraft where such parts or modification will not affect the flight, structural, or safety characteristics of the aircraft. The FAA does not agree. In order to maintain the airworthiness of any aircraft, including agriculture and other special purpose aircraft, parts used in altering or maintaining that aircraft must meet the airworthiness requirements applicable to that product. Moreover, the FAA is not aware that there are parts used in the altering or maintaining of an aircraft, especially agriculture or other special purpose aircraft, that would not affect the flight, structural or any other safety characteristic of the aircraft and the commentator did not identify the parts he had in mind. Thus, the FAA is not aware of any parts that would be produced for sale for installation on a type certificated product that should not be covered by the requirements of Section 21.303. It should be noted, however, that parts produced by an owner or operator for maintaining or altering his own product are excepted from the requirements of Section 21.303 and this exception would also apply to owners and operators of agriculture

or other special purpose aircraft. In this connection, one commentator objected to excluding from the PMA requirements parts produced by an owner or operator for maintaining or altering his own product. However, such parts are not produced in quantity and the airworthiness of the parts is determined during the process of approving the design change or the maintenance for the aircraft. Such parts have been excepted from the PMA requirements for a number of years without any adverse effect on safety.

Numerous comments were received concerning proposed Section 21.303(c) which specifies the data and other information that must be submitted with a request for a PMA. Some of the

commentators suggested that the proposal should be strengthened by requiring a PMA applicant to further identify and explain the source of the substantiating technical data submitted with his application. Other commentators felt that such a requirement was unnecessary and that if the drawings, specifications, and other technical data submitted by an applicant established that the design of the part meets the applicable airworthiness requirements no further requirement should be imposed on the applicant. The purpose of Section 21.303(c) is to ensure that the design data which a PMA manufacturer uses to produce replacement and modification parts meets the airworthiness requirements applicable to the product on which the part is to be installed and the proposal, as modified herein, would require the applicant to submit the technical data and test reports necessary for the FAA to make that determination. If the design meets the applicable requirements and the parts are manufactured under the required fabrication inspection system, they will be safe for installation on the type certificated product. To require an applicant to present to the FAA data which is not necessary for that determination cannot be justified in the interest of safety. In addition, some confusion concerning the proposed requirements of Section 21.303(c) is evident from a reading of the comments. In this connection, the proposal has been revised to make it clear that a part need not be identical to a previously approved part in order to be covered by a PMA. Manufacturers who produce replacement or modification parts based on a new design may obtain PMA approval for such parts if they meet all the applicable requirements. In addition, the regulation has been revised to make it clear that all applicants for a PMA must submit the required design data. However, if an applicant shows that his design is identical to a previously approved design, the regulations make it clear that he need not furnish the test reports and computations that supported the approval of that design. This has long been a practice in complying with Section 21.303 and it is set forth in Advisory Circular AC No. 21.303-1

dated March 2, 1966. In this connection, while the proposal required the applicant to furnish the "technical data necessary to substantiate the design", the final rule uses the language of Section 21.21(b) referenced in the current regulation and requires that the applicant submit the test reports and computations necessary to show that the part meets the applicable airworthiness requirements. In this instance, the applicable airworthiness requirements are the airworthiness requirements applicable to the product on which the part is to be installed.

In response to numerous comments, the term "reverse engineering" is not used in the final rule. As pointed out by the comments, reverse engineering is but one way that an applicant may obtain the design for his part. Therefore, there is no need to use the term in the regulation. It should be noted that, as indicated in the Notice, the FAA does not expect that designs of parts obtained through reverse engineering would be identical to that of the original. Therefore, it is expected that test reports and computations would be necessary for such

parts. Finally, the proposal required that an applicant submit, in addition to the drawings and specifications, "other technical data" necessary to establish the design of the part. In response to comments, the final rule identifies such "other technical data" as information on dimensions, materials, and process necessary to define the structural strength of the part.

Many comments suggested changes to the requirements of proposed Section 21.303 which merely sets forth in detail the requirements of Part 21 which are incorporated by reference in present Section 21.303(a). Most of these suggestions would require substantive changes in the current requirements and are outside the scope of the Notice. Although many of the suggested changes cannot be adopted on the basis of Notice 69-36, they will be given further consideration and those having merit will be included in future rulemaking concerning this matter.

The requirement in proposed paragraph (i) of Section 21.303 has been deleted because it would be an unnecessary duplication of the requirement for identification of replacement and modification parts in Section 45.15 of Part 45. Proposed paragraph (j) is adopted as paragraph (i), without change.

One comment objected to the requirement in proposed paragraph (k) that the holder of a PMA must notify the FAA within 10 days after relocation or expansion of his manufacturing facilities at other locations. The commentator stated that 10 days was unduly restrictive and recommended it be changed to 30 days. The FAA does not agree. The requirement is merely one of

notification and to delay notification for 30 days, particularly when critical parts are involved, would hinder the FAA's surveillance of PMA manufacturers. The amendment is adopted as proposed and designated as paragraph (j).

Proposed paragraph (l)(1) of Section 21.303 has been deleted because it duplicates the requirement of paragraph (h) and the amendment to proposed paragraph (l)(2) is adopted without change and designated as paragraph (k).

Proposed Section 45.15 did not expressly except small parts or parts on which marking is impractical from the requirement that parts must be marked with manufacturer's identification and the part number. However, in response to comments, it has been determined that the regulation should permit any or all of the information specified in Section 45.15 to be set forth on a tag attached to the part when the part is too small or the required marking is otherwise impractical. The proposal has been revised accordingly.

Two comments recommended that proposed Section 45.15 be changed to require that all the parts be marked with the manufacturer's identification to permit identification of each part that fails. The FAA does not agree. Such a requirement is not appropriate for the parts that are too small or otherwise

impractical to mark. In these instances such information should be marked on a tag attached to the part or its container.

In consideration of the foregoing, Parts 21 and 45 of the Federal Aviation Regulations are amended, effective June 26, 1972.

These amendments are adopted under the authority of Sections 313, 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354, 1421, and 1423), and Section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

NOTE: The reporting and/or recordkeeping requirements contained herein have been approved by the Bureau of the Budget in accordance with the Federal Reports Act of 1942.

Amendment 21-39

Noise Standards for Newly Produced Airplanes of Older Type Designs

Adopted: October 19, 1973 Effective: December 1, 1973

(Published in 38 F.R. 29596, October 26, 1973)

The purpose of these amendments is to require certain new production turbojet and transport category airplanes to comply with the noise standards of Part 36 of the Federal Aviation Regulations, irrespective of type certification date, as a condition for the issuance of certain standard airworthiness certificates. The primary basis for these amendments is Section 611 of the Federal Aviation Act of 1958 (49 U.S.C. 1431) as amended by the Noise Control Act of 1972 (P.L. 92-574).

These amendments are based on Notice 72-19, published in the Federal Register on July 25, 1972 (37 FR 14813). Interested persons have been afforded an opportunity to comment on the matters contained herein, and all relevant comments have been considered in the issuance of these amendments.

Pursuant to 49 U.S.C. 1431(b)(1), the Federal Aviation Administration has consulted with the Secretary of Transportation, concerning all matters contained herein, prior to the adoption of this amendment. Pursuant to that paragraph and Section 8(b) of the guidelines of the Council on Environmental Quality concerning statements on proposed Federal actions affecting the environment, published in the Federal Register on April 23, 1971 (36 F.R. 7724), the Federal Aviation Administration has consulted with the Environmental Protection Agency and has submitted this amendment to that agency for review and comment.

Public comments received in response to Notice 72-19

concerned the following issues: The economic reasonableness, basic fairness, and cost effectiveness of the noise limits to be applied; the timing of the proposed amendments; the scope of the proposed regulation, relation to international certification concepts; use of the airworthiness certificate as the instrument of compliance; the details of noise measurement in Part 36; and compliance with Section 102(2)(C) of the National Environmental Policy Act of 1969.

Public Comments

Comments Concerning the Economic Reasonableness, Basic Fairness, and Cost Effectiveness

Numerous public comments were received concerning the economic reasonableness, basic fairness, and cost effectiveness of the proposed regulations. These comments, and the FAA's response thereto, are as follows:

1. The notice justified applying Part 36 noise limits to the production of new aircraft now, and deferring for further analysis the question of retrofit of operating aircraft. One reason stated for this approach was that the economic impacts of production line changes are less severe than the economic impacts of changes to operating aircraft. It was argued, in one comment, that the distinction between the economic aspects of production line aircraft modification and the economics of retrofit of operating aircraft is an invalid distinction, and that retrofit and production modification should not be separately accomplished but should both be done together, immediately. The FAA agrees that the total solution to the noise problem involves reduction of the noise of the fleet of operating aircraft (as well as noise restraints imposed during production.) However, the FAA also believes that the economic implications of retrofitting fleet operating aircraft are sufficiently different from those of production line modification of currently produced aircraft to justify taking this incremental step now without waiting for fleetwide retrofit or replacement of older operating aircraft with newer types.

2. It was stated that the only benefit from the proposed regulation is halting of the rise in nuisance, that this rise is only slight, and that the public benefit therefore does not justify the cost. This comment neglects the critical complementary relationship between source noise reduction and land use management. The FAA believes that a major precondition of responsive local land use decisions around airports is Federal action to firmly contain, at predictable and definable levels, the source noise of aircraft. This amendment takes a definite step in that direction by ensuring that all new production subsonic transport category and turbojet engine powered aircraft, like new aircraft types within those classes, come within the noise limits of Part 36. Whether or not this amendment, like Part 36 itself, will halt or reduce annoyance (in terms of how

many people are how badly affected) will necessarily be closely related to the effectiveness of State and local initiatives in moving toward land use compatibility around airports based on the clear and definite source noise limitations of Part 36. The true public benefit of this amendment and of following efforts to reduce fleet noise levels thus depends, to an important extent, on the success or failure of the land use aspect of the airport noise problem. Considering the extreme importance of a firm source noise limit to local land use initiatives, the FAA believes that the costs to be borne by the aircraft industry to meet this amendment are reasonable and necessary even if the specific degree of public benefit to be actually derived from the needed corresponding land use controls cannot be guaranteed by this amendment until such land use controls are exercised.

3. It was stated that the regulation would create an inequity since operations of complying aircraft would be penalized with respect to both initial cost and increased operating cost, when compared with operators of noncomplying aircraft already in the fleet. The FAA believes that the cost differences between these two classes of operators are acceptable and are justified by the need to begin the process of controlling the noise of older type designs at the production phase. It is further believed that, contrary to this comment, the economic and other noise related pressures on operators of noncomplying aircraft will in fact make that class of aircraft the less desirable one for operators concerned with the long term impact of airport community relations and for operators concerned with the fact that future rule making will ultimately eliminate the class of aircraft that do not comply with Part 36 noise limits.

4. It was argued that FAA should wait for the normal attrition of older aircraft and should encourage the evolution of truly beneficial new type designs, but should avoid the great cost and small benefit of modifying older type designs. It was also argued that the Notice of Proposed Rule Making was in error in stating that continued production of older aircraft without noise treatment delays the introduction of newer, quieter aircraft into the fleet. It was finally stated that most older aircraft types will be retired, regardless of rule making, by the end of the decade. In contrast to this, another comment stated that "the continued production of noisy, old-technology aircraft is an economic disincentive to investment in the newer, more environmentally compatible designs and, as such, should be discouraged." The FAA does not believe that waiting for the normal retirement of older aircraft is a viable or effective approach to controlling the noise generated by the current fleet of aircraft. Practicable means exist for taking incremental actions, such as this amendment, to contain the impact of new noise sources within the established limits of Part 36. As the notice stated, continued production of new aircraft without noise treatment counteracts the acoustic benefit available from the

introduction of new technology aircraft. This is true regardless of the policies to be applied to older aircraft now in the fleet and is particularly relevant since the purchase of these new aircraft may represent decisions not to purchase a competitive

new technology aircraft. To this extent, the FAA agrees that continued production of older aircraft is in fact an economic disincentive to investment in the newer types of aircraft.

5. It was argued that it is unfair to require aircraft at the low end of the weight scale to come down in noise to levels that are lower than are acceptable under Part 36 at the higher weights, since community annoyance is not related to weight. This argument ultimately leads to the conclusion that all aircraft noise levels should be permitted to be as high as those of the heaviest aircraft. Since weight is directly related to the propulsion requirements of an aircraft, and those requirements significantly affect the amount of quieting that can be accomplished, the purpose of the weight parameter in Part 36 is to ensure that all reasonable noise abatement technology is applied for each weight. It should also be pointed out that lighter aircraft may be operating in and out of close-in community noise environments associated with smaller airports and should accordingly receive all the noise abatement technology that can reasonably be applied to aircraft of their lesser weights regardless of whether that same degree of quieting is possible for heavier aircraft.

6. It was stated that it is unfair to require design changes in the latest production aircraft without requiring changes in operating procedures. The question of operational procedures is being studied by the FAA to determine which procedures would be most responsive to the particular needs of particular airport/community situations. Air traffic control procedures already employed include provisions for keeping traffic at higher altitudes where possible near noise sensitive areas, and for the use of preferential runways and traffic flow patterns that minimize noise impact to the extent possible. When further procedures are developed that are shown to bring significant benefits to the communities around airports, they will be employed. However, the FAA does not believe that it is inequitable to require source noise reductions during the period that operating procedures are being developed or modified as experience is gained in that regulatory area, particularly since the resulting aircraft modifications will increase the effectiveness of virtually any procedures selected later.

7. It was stated that the rule is not economically reasonable for business jets, and that, because of the relatively small number of new general aviation jet aircraft that are expected, the cost of the necessary development programs "would be substantial, and for all practical purposes uneconomic --" it

was emphasized that the real economic impact of the regulation is

in the engine and airplane research and development programs required to develop complying hardware. Another comment stated that effective research and development programs for small jets, such as the extensive programs for heavy aircraft that were federally funded, should also be federally funded, and that, without such Federal funding, the developmental costs of complying with the regulation would be impossible to absorb. The FAA recognizes that there has not been Federal funding of noise research, for smaller jet aircraft, to the extent that such funding has been provided for the larger aircraft. However, the present rulemaking has been determined to be reasonable and appropriate at this time, without Federal funding, because of the success of private industry initiatives. The manufacturers of business and corporate jet airplanes and jet engines have, without Federal funding, instituted developmental programs that have successfully resulted in the technological capability to produce airplanes that can be shown to comply with Part 36 within the compliance periods specified in this amendment. Thus the costs of compliance with this amendment, with respect to the development of the requisite technological capability, have to a large extent already been incurred. These costs were incurred, wholly apart from regulatory pressures, to ensure the continued viability of business jet capital investments under increasingly severe environmental pressure affecting aircraft marketing. In **SUMMARY**, the FAA does not believe that issuance of this amendment creates research and development costs that require Federal financial support. However, it is recognized that future regulatory action may result in technological developments requiring a reassessment of the need for Federal research and development funding.

8. It was stated that the regulation should specifically exclude aircraft that are already sold or offered with a firm price option as of the rule adoption date because such aircraft represent commitments for which the manufacturer cannot recover additional new hardware costs. The FAA recognizes that any change in regulatory law that affects aircraft design and that is made effective anytime before the distant future may affect the relations between manufacturer and purchaser. Safety-related technical modifications and product replacement modifications are often accomplished on aircraft during production. The precise apportionment, between manufacturer and purchaser, of cost increases during production is properly arrived at as a matter for contract between buyer and seller. As a practical matter, some aircraft are sold years before delivery. Acceptance of this comment (e.g. by excluding aircraft that were "sold" or "offered with a firm price option" on the rule adoption date) could result in continued production of noncomplying aircraft for many years.

Finally, a regulation whose effectivity was dependent upon proof of the status at law of a contract price would be virtually impossible to administer fairly and impartially. For these

reasons, this comment cannot be accepted. For these reasons also, the FAA disagrees with another comment requesting exclusion of "all aircraft under contract or firm option as of October 1972."

9. It was urged that the FAA consider the probability of lost or canceled aircraft sales in its determination of the economic reasonableness of the costs of complying with the regulation. While this probability is difficult to assess, the FAA is encouraged to note that a growing number of aircraft manufacturers and operators, reacting to the increasing importance of aircraft noise as a detriment to industry growth, have chosen to stress compliance with Part 36 as a significant competitive factor. The FAA believes that this reflects the development of long range changes in the response of aircraft marketing factors to the problems of community acceptance and airport noise, and that lack of compliance with Part 36 will eventually be more closely related to lost or cancelled aircraft sales than will the economic costs of complying with the regulation.

10. It was stated that it would be economically unreasonable to require that aircraft, that are modified during production to meet Part 36, also be modified again under a later retrofit requirement. This comment stated that issuance of this amendment should be accompanied by a guarantee against such "recurrent retrofit." The FAA agrees that, on any subsequent noise retrofit program, the combined economic impacts of that program and of other environmental regulations (such as aircraft emission requirements or previously issued noise requirements) may be considered in an overall determination of economic reasonableness. However, the FAA does not believe that it would be consistent with its overall environmental responsibilities to exclude aircraft from later reasonable environmental control regulations merely because earlier regulations have been complied with.

11. It was stated that the regulation should permit exceedances over the Part 36 noise limits in order to accommodate the necessary practice of intermixing engines or nacelles. Such intermixing occurs when engines or nacelles (which may have been produced earlier or produced as replacement components and might not incorporate the required acoustical design provisions) are installed, as quick change units, to minimize aircraft down-time. The result may thus be the replacement of one or more

acoustically treated engines or nacelles with untreated components. The FAA understands the great importance of intermix to efficient fleet management. However, it is believed that any noise deterioration resulting from these normal intermix practices should occur within the Part 36 noise limits. This is essential to public confidence in the accuracy and meaning of the noise limits, set in Part 36, as descriptors of the actual noise

reductions achievable by the airplane. The FAA believes that the manufacturers should reasonably be expected to ensure that their products have sufficient compliance margin under the Part 36 noise levels to permit their customers to engage in such a wide spread and common practice as engine nacelle intermix without exceeding the maximum noise limits prescribed for the airplane.

Comments concerning the timing of the proposed regulations

Comments were received stating that the proposed regulation, while not reasonable as proposed, could be made reasonable by delaying the compliance **DATES**. These specific comments, and the FAA responses thereto, are as follows:

1. It was stated that, in order for the requisite noise research and development to be accomplished for smaller jet aircraft, compliance with Part 36 should not be required for business jets before the "end of this decade." It was argued that this time lag would be needed if the history of acoustical research for large jets is any guide to the amount of research that would be needed for the smaller jet aircraft. The FAA disagrees with this comment. Extensive review of all material submitted with respect to the smaller jet aircraft (e.g. airplanes with maximum weights of 75,000 lbs. and less) indicates clearly that, with one possible exception, production quality hardware adequate to permit Part 36 to be achieved is either now available, or will be available for installation on production aircraft, before the date specified in this amendment (December 31, 1974). The one aircraft for which this evaluation is less clear is a business jet for which the required production quality hardware may not be available to be incorporated on a production basis until early or middle 1975. However, the FAA believes that, even for this aircraft, a maximum effort on the part of the manufacturer has a reasonable chance of meeting the compliance date in this amendment, and that the compliance date for the entire class of business jet aircraft should not be delayed in order to accommodate the potential problems of the one aircraft type. This amendment, therefore, specifies December 31, 1974, as the compliance date for all airplanes with maximum weights of 75,000 lbs. and less. If the manufacturer of the aircraft in question believes that he can demonstrate that this deadline should not, in the public interest, be applied to his aircraft,

he may petition for an exemption that must, under the Noise Control Act of 1972, be reviewed by the FAA in consultation with the U.S. Environmental Protection Agency. No suggestions is made here with respect to the result of such a review.

2. It was argued that a delayed compliance date of mid-1978 should be chosen to permit introduction of the requisite design technology into the "normal cycle for development of new engine airframe combinations." The problems of procurement of long-lead hardware (such as forgings), the time problems involved in

providing production engineering drawings, designing and building production tooling, and assembly of the new hardware on the aircraft were stressed as reasons for delaying implementation of the rule. After thorough review of all of these factors, the FAA believes that the compliance **DATES** in this amendment provide adequate time for compliance and that no further extension of time is justified. It should be pointed out that these **DATES** involve a relaxation from those proposed in the Notice, which contemplated compliance by July 1, 1973, or July 1, 1974, depending on aircraft weight.

3. It was argued in docketed comments that the result of the Notice, if issued as a final rule, would be the virtual shutting down of production of one airplane type. However, information obtained since receipt of the docketed comments indicates that this early assessment was overly conservative and that the business jet in question will in fact be able to be produced, in compliance with this amendment, on or before December 31, 1974.

4. It was stated that the regulation should be effective for JT8D powered airplanes first flown on or after January 1, 1974, and for JT3D powered airplanes first flown on or after January 1, 1975. After review of all material submitted with respect to the power plants that are employed in the larger jet aircraft, the FAA believes that December 1, 1973, is a reasonable date for all engines except the JT3D and that December 31, 1974, is a reasonable date for aircraft powered by that engine.

5. It was stated that the regulation should not become effective, for the smaller jet aircraft, less than 30 months after its issuance. It was argued that such a delay is necessary "to accomplish the required design changes and configuration compromises in the vehicle for compliance with both noise and engine emission standards." The FAA agrees that the combined economic effects of noise and emission standards should be carefully watched, and has been working closely with the U.S. Environmental Protection Agency to ensure that there is a coordinated review of the economic impacts of the aircraft noise regulatory program of the FAA and the economic impacts of the aircraft emission control program of EPA (which will be implemented through the issuance of regulations by the FAA). In addition, EPA, in close cooperation with the FAA, is coordinating its own aircraft noise control program (under the Noise Control Act of 1972) with its aircraft emission control program to ensure that noise standards recommended to the FAA by EPA (under the Noise Control Act of 1972) take into account the combined economic impact of noise and emission controls. FAA is confident, in view of this close and continuing coordination, that compliance with this amendment, on or before the **DATES** specified herein, will not be rendered infeasible or unreasonable by mission regulations affecting the same aircraft.

6. It was stated that one type of air carrier aircraft for which Part 36 capability has already been achieved should be immediately subject to the regulation. Considering that, under this amendment, the required hardware must be procured to be installed across the board on all production versions of this airplane, the FAA believes that the time between issuance of this amendment and the prescribed compliance date (December 1, 1973) does not represent an unreasonable delay.

7. It was stated that, from a cost effectiveness point of view, for aircraft for which substantial quieting below Part 36 noise levels is possible by reengining, the costs of an interim (but acoustically less effective) noise reduction to Part 36 noise levels should not be imposed now, and an additional grace period of two years, justified by the greater benefits to be obtained from reengining, should be allowed. The argument that a near term, available environmental improvement should not be implemented if a greater benefit is expected at a later time has some merit in cases in which compliance with the earlier requirement would clearly prevent the later benefit from being achieved in a reasonable manner. The FAA does not believe that this is the case in this instance and that, if more effective noise reductions become possible through the development of new engines, nothing in this amendment prevents those engines from being developed and installed in an economically sound manner. Therefore, the FAA does not believe that, in this case, the benefits to be obtained from this amendment should be deferred until new engines are developed.

8. Comments concerning the international aspects of the compliance **DATES** in this amendment are addressed in section IV below.

Comments Concerning the Scope of the Proposed Regulation

The following comments were received concerning the applicability and scope of the proposed regulation:

1. It was stated that the regulation should not be limited to transport category and turbojet engine powered airplanes, but should also apply to all other aircraft types, including rotorcraft. The FAA intends to address the noise problem of other classes of aircraft and to develop regulations that achieve the maximum reasonable noise reduction for each class. Part 36, as currently effective, has not been determined to accomplish this purpose for classes of aircraft other than transport category and turbojet engine powered airplane. This amendment, therefore, continues the limitation of current Part 36 to those airplanes.

2. It was stated that the regulation should be broadened to include military aircraft. This comment cannot be accepted in view of the limitation of Title VI of the Federal Aviation Act of 1958 (including the noise abatement authority in Section 611, as amended by the Noise Control Act of 1972) to "civil aircraft,"

which term excludes "public aircraft." Military aircraft are "public aircraft."

3. It was stated that newly produced aircraft of older type designs should automatically be covered by later changes to Part 36 and that the limitation of the Part 36 reference to Part 36 "as effective on December 1, 1969" shows a "misguided preoccupation with the economics of noise reduction." In view of the clear command in Section 611 of the Federal Aviation Act to consider economic reasonableness, the effect of this recommendation would be to limit the severity of new Part 36 amendments to levels that are "economically reasonable" (however that term is defined) for older type designs. The FAA prefers to issue, for new type designs, regulations that take advantage of all acoustical design potentialities that are available at the early design stage without its environmental objectives being unnecessarily handicapped by the need to consider the impact of such aggressive rule making on older type designs. When it is determined that the technology is available to bring new production versions of older type designs into conformity with later amendments of Part 36, such action is not precluded by this amendment, and can be accomplished by later rule making.

4. It was stated that the regulation should stop all growth in air traffic. In support of this comment it was argued that it makes little sense to decrease the operational noise of individual aircraft and then allow more such aircraft to operate. The FAA believes that the major problems of aircraft noise can be resolved, consistent with the increasing public need for air transportation, by an aggressive combination of source noise reduction and airport land use compatibility planning and land use plan execution. In view of the clear public need for use of the navigable airspace to move persons and property in increasing quantities, the FAA believes that environmentally responsive growth, not termination of growth, is the necessary and appropriate objective.

5. It was stated that the basic standards in Part 36 should be lowered for all aircraft type certificated after January 1, 1980. The question of reduction of Part 36 noise levels for new type certificates is now being considered and will be the subject of a separate regulatory proposal.

6. It was stated that July 1, 1974, should be designated "total retrofit compliance day" for all operational aircraft not already covered by the regulations. The FAA agrees that retrofit of currently operating aircraft (as opposed to assembly of newly produced aircraft in compliance with Part 36) is an important aspect of reduction of total fleet noise levels. This problem is being addressed as a separate regulatory issue. With respect to the specific date mentioned in the comment, however, the FAA has not yet determined that the required technology and hardware will

be available to reasonably support a total retrofit program effective on July 1, 1974.

Comments Concerning the International Aspects

The international aspects of the proposed regulation were raised in the following comments:

1. It was stated that the Notice unnecessarily departed from traditional policy and practice by providing, for import aircraft, that compliance would be shown if the country in which the aircraft was manufactured certifies (and the Administrator finds) that Part 36 is complied with. It was argued that, for noise type certification, the FAA, in Section 21.29, permits the country of manufacture to certify that the aircraft meets either the U.S. regulation or else meets the requirements of the manufacturing country plus any other requirements prescribed by the Administrator to provide noise levels no greater than those prescribed in the U.S. regulation. The FAA agrees that there is no valid reason for this not to apply as well to airworthiness certification findings related to Part 36. This change is, therefore, made as requested ¢see Section 21.183(e), last sentence|.

2. It was stated that the regulation should not apply to

aircraft sold to foreign operators, and should not apply to "the issuance of export certificates of airworthiness by the FAA whether or not the foreign government imposes noise rules of its own." This amendment, like the Notice, is limited to aircraft for which U.S. standard airworthiness certificates are applied for under Section 21.183 and thus does not apply unless such application is made under that section.

3. It was stated that the compliance date should be the same as that specified, in ICAO documents, for compliance with the Noise Standards of ICAO Annex 16, by newly produced aircraft not already covered by that Annex. That date is January 1, 1976. In support of this comment, it was stated that the recommended ICAO date was agreed to in the U.S. position paper, and that "the enforcement of noise standards which, by their technical content or methods of application, are at variance with the standards defined and adopted by ICAO constitutes, in short, an impediment to the harmonious development of air transport and to related trade." It was also stated that a uniform international scheme is essential to any concept of economic reasonableness, and that "the presence of different standards for each country would have serious consequences for international aviation as a service to the world community."

With respect to the U.S. position supporting the recommended ICAO date, this support was based on an assessment of the worldwide impact of the proposed extension of Annex 16 to new production aircraft of all nationalities. This required a more conservative timing conclusion than is consistent with the

domestic need to achieve the earliest reasonable compliance by aircraft being issued standard U.S. airworthiness certificates. The FAA does not imply by its choice of **DATES** and other requirements specified in this amendment, that these **DATES** and requirements could be considered equally applicable for other countries. With respect to the value of worldwide uniformity in noise regulatory actions, however, it is agreed that such is desirable where it does not conflict with clearly determined domestic environmental imperatives. In the case of this amendment, it is believed that the **DATES** specified herein are essential to respond adequately to the clear intent of the Congress, expressed in the Noise Control Act of 1972 and its legislative history that an aggressive and early attack on the problem of aircraft noise be accomplished as soon as it can be justified in the light of economic and technological considerations.

Comments Concerning Use of the Airworthiness Certificate as the Instrument of Compliance

Unlike Part 36, which, until this action, regulated type certification only, this amendment prescribes compliance with noise standards as a condition to the issuance of standard airworthiness certificates. The following comments were received on this aspect of the regulation:

1. It was stated that "the status of airworthiness certificates should not be clouded by noise requirements," and that the proper approach is "amendment of the type certificate." In support of this statement, the comment referred to the handling of the Boeing 747 under Part 36, which provided for the placing of a time limit on the original type certificate of that airplane. Since this amendment applies only to aircraft for which a type certificate has been issued in the past, the result of this comment, if accepted, would be action by the FAA, retroactively, to terminate the legal effect of previously issued type certificates. This would be a fundamentally different action from that involved in the case of the Boeing 747, which case involved only the prospective act of issuing a type certificate with a time limitation. The FAA believes that it is far less damaging to the interests of type certificate holders to attach conditions to the issuance of subsequently issued airworthiness certificates than to retroactively cloud the type certificate itself with a subsequently issued time limitation on that document.

2. It was stated that shifting the noise compliance process to individual airworthiness certificates is a "profound change" and "greatly diminishes the value of the type certificate." For reasons mentioned above, the FAA believes that use of the airworthiness certification process as the compliance device will have much less effect on the value of the type of certificate than would retroactive amendment of that certificate itself. As stated in the Notice, the airworthiness certificate is a

particularly appropriate means of ensuring that individual newly produced aircraft of previously type certificated designs incorporate specific acoustical design features prior to operation. The value of that certificate for this purpose lies in the fact that the airworthiness certificate is individually issued to each aircraft after production, and is, therefore, useful as a means of distinguishing (by date of issuance) those individual aircraft within a production run that require noise compliance.

Comments Concerning the Details of Noise Measurement.

The Notice proposed to apply, to new production aircraft, the requirements of current Part 36 without substantive change. The following comments recommended that changes be made in details of Part 36 as applicable to newly produced aircraft:

1. It was stated that the takeoff noise measurement procedure in current Part 36 is unduly restrictive, and that, rather than require an actual takeoff and a specified climb profile, the regulation should permit determination of noise as a function of power setting during a series of level flyovers of partial climbs. It was stated that such a procedure would be superior to Part 36 in that it would eliminate the need for finding an airport for the noise test, while at the same time providing noise data that are as accurate as those derived under the Part 36 procedure. The FAA does not believe that such an amendment of Part 36 is capable to ensuring accurate noise data for all aircraft covered by Part 36. However, if, for a particular aircraft type, it can be determined that a procedure equivalent to any specific takeoff procedure in Appendix A should be approved, that Appendix allows such approval to be made.

2. It was stated that Part 36 should be amended to increase the tradeoff allowance (under which procedure a noise level exceedance at one measurement point can be approved if it is offset or "traded off" by showing noise levels less than the prescribed limit at other measurement points). The FAA does not believe that it is technically or economically unreasonable to apply the current tradeoff provisions to newly produced aircraft or older type designs. This requested relaxation in the rule is, therefore, not believed to be justified.

3. It was stated that the sideline measurement point should be standardized at .35 N.M. rather than preserved as .35 N.M. for 4-engine airplanes and 25 N.M. for airplanes with less than 4 engines. The effect of this request would be to relax the noise limits for the latter class of airplanes. Such a relaxation is not justified by the reason that was submitted in support of this request (namely, that annoyance is not a function of the number of engines), and is not supported by other technical and economic data.

4. It was stated that the minimum reduced power climb

gradient specified in Part 36 should be 4% (not the currently prescribed 4% or the gradient resulting from level flight thrust with one engine inoperative, whichever gradient is higher). The reason for this request is that for many aircraft a straight 4% gradient requirement would result in less thrust, which would be quieter. This comment appears to miss one essential purpose of Part 36, which is to not only set noise limits but require that these limits be met with the airplane developing substantial power in order to force the development of real acoustical design improvements rather than permit compliance through quiet piloting

techniques. The effect of accepting this comment would be to relax the severity of the acoustical design provisions that must be incorporated in the airplane in order to meet the specified noise limits. This is not viewed as justified.

Comment Concerning Compliance with Section 102(2)(C) of the National Environmental Policy Act of 1969

It was stated that issuance of this amendment should be delayed for the preparation and circulation of draft and final environmental impact statements under Section 102(2)(C) and related guidelines and orders. Under those guidelines and orders, when a major Federal action "significantly" affects the quality of the human environmental, preparation and circulation of draft and final environmental impact statements are required. This comment takes the position that the impact statement requirements apply in this case. After review of the potential impact of this amendment, the FAA believes that the amount of noise reduction involved and the limited number of affected aircraft require the conclusion that this amendment will not cause a "significant" reduction in the community impact of overall fleet noise. This amendment in no way precludes or limits other environmentally protective regulatory actions that the FAA may take, and does not involve environmental impacts other than the required noise reduction. For all of these reasons, a negative declaration outlining these considerations in detail has been prepared for this action, in accordance with applicable requirements.

Two editorial changes are made to the language proposed in the Notice. The title of Part 36 is revised to refer specifically to type and airworthiness certification rather than refer only to the general term "certification." Also, the language in proposed Section 21.183(d) was unduly complex and has been simplified. No substantive change results.

Authority: Sections 313(a), 601, 603, 611, Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1431 (as amended by the Noise Control Act of 1972 (P.L. 92-574)), sections 2(b)(2), 6(c), Department of Transportation Act (49 U.S.C. 1651(b)(2), 1655(c)), Title I of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.), Executive Order 11514, Protection and Enhancement of Environmental Quality, March 5, 1970.

In consideration of the foregoing Parts 21 and 36 of the Federal Aviation Regulations are amended, effective December 1, 1973.

Amendment 21-40

Aircraft and Aircraft Engines -- Certification Procedures and Type Certification Standards

Adopted: September 20, 1974 Effective: October 31, 1974

(Published in 39 F.R. 35452, October 1, 1974)

The purpose of these amendments is to change the procedural requirements relating to the type certification of aircraft and aircraft engines, to update and improve the airworthiness standards applicable to the type certification of aircraft engines, and to incorporate new standards applicable to engines used on supersonic airplanes. In addition, other new airworthiness standards are made applicable to aircraft on which engines type certificated to previous standards are to be installed.

These amendments are based on the Notice of Proposed Rule Making (Notice No. 71-12) published in the Federal Register on May 5, 1971 (36 F.R. 8383). Except for minor editorial changes, and except as specifically discussed hereinafter, these amendments and the reasons therefor are the same as those proposed in Notice 71-12. Numerous comments relating to these proposals were received in response to the Notice and except for those indicating agreement or merely repeating issues discussed and disposed of in the Notice, the FAA's disposition of the significant comments is discussed below. In general, comments received that were beyond the scope of the Notice are not discussed but will be retained for consideration in connection with other rule-making projects as appropriate. Based on the relevant comments and upon further review within the FAA, a number of changes have been made to the proposed rules. In addition, various non-substantive changes of a clarifying and editorial nature have been made. Since these changes impose no additional burden on any person, they may be adopted without further notice and public procedure.

Interested persons have been afforded an opportunity to participate in the making of these amendments, and due consideration has been given to all matter presented.

Two of the proposals of the original Notice concerning engine rotor system unbalance (Sections 25.1305 and 33.29) have been implemented by a separate rule-making action, Amendments 25-35 and 33-5, effective March 1, 1974, that were published in the Federal Register on January 15, 1974 (39 F.R. 1831).

The following discussion is keyed to the like-numbered proposals contained in Notice No. 71-12:

PART 1— DEFINITIONS AND ABBREVIATIONS

Proposal 1 -- One commentator objected to the inclusion of a turbo-supercharger as part of the engine in the proposed definition of aircraft engines in Section 1.1, asserting that in some instances it should be classified as an accessory. However, the intent of the proposal was that turbo-superchargers be included as part of the engine whether or not they are additionally classified as accessories. The definition as adopted has been revised to clarify that a turbosupercharger is part of an engine whether or not it is also an appurtenance or an accessory.

Proposal 2 -- Several commentators suggested that the term "stop" be deleted from the definition of "idle thrust" as proposed in Section 1.1 since a stop is normally associated with the power control lever or throttle, rather than with the engine fuel control device as suggested in the Notice. The FAA agrees with the comment to the extent that the term "idle thrust" should be related to the power control lever and has changed the definition by replacing the term "fuel control device" with "power control lever." Since the term "stop" is appropriate with this revision, it need not be deleted.

One commentator pointed out that several of the proposed amendments used the term "type" in reference to engines and that the word "type" was defined in relation to aircraft in Section 1.1 but not to engines. For internal consistency, the definition of "type" has been amended to include the meaning of the term with respect to the certification of aircraft engines.

PART 21 — CERTIFICATION PROCEDURES FOR PRODUCTS AND PARTS

Proposal 1 -- Several commentators suggested that the stress analysis called for in proposed Section 21.15(c) for the engine rotor, spacer, and rotor shaft would not normally be available at the time of application for a type certificate, but would be available before actual certification. The FAA agrees and, upon further consideration, has determined that inclusion of the requirement under the type certification standards will allow an applicant to complete and submit a stress analysis after application for a type certificate and before certification. The requirement for a stress analysis has therefore been removed from Section 21.15(c) and relocated in a new Section 33.62 under the

design and construction requirements for turbine aircraft engines.

Proposal 2 -- Several commentators recommended deletion of that portion of the proposed Section 21.35(f) which requires 300 hours of flight test operations for aircraft incorporating engines of a type not previously used in a type certificated aircraft. They contended that the rule discriminated against new engine types, and that unnecessary economic hardships and delays in the aircraft certification program would be imposed. However, experience with newly certificated engine types has demonstrated to the FAA that there is a need for more thorough flight testing of newly certificated engine types, and the regulation with respect to hours of operation is adopted as proposed. Furthermore, the suggestion of one commentator that allowance be made for the use of experimental engines that differ only in minor ways from the type certificated engine has not been adopted because the FAA believes it could lead to uneven administration of the rule.

One commentator questioned whether the phrase "engines that conform to a type certificate" in subparagraph (f)(1) required just one or a full complement of the newly type certificated engines in a multi-engine aircraft. As indicated in the explanation in the Notice, the intent of the FAA is that "engines" means all the engines in the aircraft. To eliminate any ambiguity, the wording has been changed to specifically call for a full complement of engines.

Proposal 3 -- No public comment was received on the proposal to amend Section 21.97 and the section is adopted as proposed.

PART 23 — AIRWORTHINESS STANDARDS: NORMAL, UTILITY, AND ACROBATIC CATEGORY AIRPLANES

Proposal 1 -- One commentator questioned whether proposed Section 23.951(b) would prohibit several fuel tanks from gravity feeding through non-return valves to a single collector box from which the fuel pumps would draw fuel. Such an arrangement is not prohibited and the rule would allow any combination of tanks to be used so long as means are taken to prevent air from being introduced into the system.

In response to the suggestion contained in several comments, the icing requirement of paragraph (c) of proposed Section 23.951 has been reworded to clarify that it is applicable solely to turbine engine aircraft, since fuel icing is peculiar to turbine fuels. Additionally, since the requirement is intended to preclude interrupted functioning of the fuel system rather than to require operation for an indefinite time, the rule has been revised to require "sustained" operation rather than "continuous" operation.

Proposal 2 -- Several commentators questioned whether an

applicant would have to comply with amended Section 23.997, as proposed, if the similar rule in Section 33.67 had already been complied with by the engine manufacturer. The FAA proposed the new requirements to assure that newly certificated aircraft would meet the standards prescribed in Section 33.67. Thus, if the aircraft manufacturer incorporated an engine which had been type certificated under new Section 33.67 the fuel system would already conform to the rule and nothing further would be required. If, however, the aircraft manufacturer incorporated an engine which had not been certificated under the new Section 33.67 he would have to take the necessary action to comply with new Section 23.997.

Several commentators questioned whether the proposed rule would require that each and every filter in the fuel system, including small screens and so-called "last chance filters," meet the requirements of paragraph (a) through (d) of proposed Section 23.997. The FAA intended that at least one filter upstream of the fuel metering device and the engine driven displacement pump meet these requirements, and the section has been clarified accordingly.

In response to a question raised by one commentator concerned with the availability of heat for the required filter or strainer, the FAA wishes to point out that the requirement for icing protection in turbine engine fuel systems, set forth in Section 23.951, applies to the entire fuel system.

As proposed, Section 23.997(b) would require a drain. Upon further consideration it has been determined that an equivalent of the drain could be provided by having the strainer or filter easily removable for drain purposes and this alternative has been incorporated into the regulation.

Proposal 3 -- One commentator questioned whether the oil sump of a dry sump engine would be considered as expansion space under the proposal. If the sump is in fact part of the oil tank, then the sump provides the expansion space specified in Section 23.1013(b)(1). Further amendment of the requirement is not considered necessary and Section 23.1013(b)(1) is adopted as proposed.

One commentator requested clarification of the phrase "that might reduce the flow of oil," used in proposed Section 23.1013(e). Several other commentators suggested that the phrase was inconsistent with, but should be identical to, proposed Section 25.1013. The FAA agrees with these comments and has revised the section to make it consistent with Section 25.1013 in this respect, by specifying that any oil tank outlet screen or guard may not reduce the flow of oil below a safe value at any operating temperature.

Proposal 4 -- One commentator suggested that the more

technically correct term "differential pressure" be used in place of "pressure," in paragraph (c) of Section 23.1015. The FAA believes, however, that the present term is adequately understood in the industry, and has not caused any misunderstanding in the past. The paragraph is therefore adopted as proposed.

Proposal 5 -- Several commentators expressed the belief that the proposed Section 23.1019 might be interpreted to require each and every oil strainer or filter in the system including small so-called "last chance" filters to conform to all the requirements of paragraph (a). The intent of the FAA is to require at least one oil strainer or filter that will filter all the oil that passes through the lubricating system while conforming to the requirements of the section. The rule as adopted has been reworded to make this clear. Another commentator objected to the word "conveys" as inappropriate in the lead-in sentence of paragraph (a). The FAA agrees and has changed the wording to refer to a strainer or filter through which all of the engine oil flows.

Several commentators interpreted the requirement of subparagraph (a)(1) for normal oil flow through the bypass as possibly requiring identical flow and proposed the word "adequate" in place of "normal." The FAA does not agree that the word "normal" means identical and used the word normal to mean normal for the system within its operating range. Therefore, the wording as proposed has been retained.

One commentator stated that filters should be serviced on a routine and normal maintenance basis rather than relying upon an indicator as proposed in subparagraph (a)(3). In this connection it should be noted, however, that the rule does not call for relaxing of any maintenance procedures but adds an additional item which will contribute to safety by providing a quick means of inspecting for possible filter contamination.

It was assumed in one comment that the standard engine oil pressure gauge would qualify as an "indicator" as required in proposed subparagraph (a)(3). While it was considered that a separate indicator would be provided, nevertheless, if the applicant can demonstrate that the oil pressure gauge would adequately perform the function of the indicator, a separate indicator would not be required. Upon further consideration, the function of the indicator in terms of contamination of the screen has been reworded for clarity.

Several commentators questioned whether the wording of subparagraph (a)(4) was realistic in requiring that no contaminants be released through the filter bypass. As proposed, the requirement stated an absolute prohibition against release of contaminants. The FAA agrees that the intended purpose may be met by requiring the bypass to be designed to minimize release of

contaminants, and the requirement is reworded accordingly.

Proposal 6 -- Several commentators objected to the requirement in proposed Section 23.1093 for operation in failing and blowing snow on the basis that no standard is specified as to the intensity or the amount of falling snow or the degree of blowing involved. They further point out that no uniform means are provided for demonstrating compliance with the section and that a small or even minute amount of snow might satisfy the letter of the law of this section. One commentator offered detailed standards that could be adopted. However, it was not the intent that specifications for all possible conditions be included in the regulation but, rather, that an applicant select the limitations desired for his airplane and then demonstrate the ability to operate within those limitations.

Several commentators asserted that the specified liquid water content of 2 grams per cubic meter was not representative of actual conditions and would result in more stringent requirements for ground operation than for flight, while another suggested that the requirement for icing protection at idle should be applicable "on the ground" rather than at sea level. Upon further consideration, the FAA agrees that a reduction of 0.6 grams would provide an adequate and safe standard for icing protection at idle conditions on the ground and the requirement has been changed accordingly.

One commentator objected to the requirement for icing protection for 30 minutes at idle, stating that there was insufficient bleed air to adequately meet the requirement for this period of time. However, experience has demonstrated that it is practical and necessary for safety of flight, and that

protection for the engine during prolonged idle prior to takeoff is essential to safety of operation. The proposal does not restrict the means for icing protection to engine bleed air, as suggested by the commentator, but allows any means or combination of means which the applicant chooses. With respect to bleed air, the intent of the requirement is that icing protection at idle be provided when the bleed air available for icing protection is at its critical condition. The section has been reworded to make this clear.

Proposal 7 -- Amendment 23-14, effective December 20, 1973, published in the Federal Register on November 19, 1973 (38 F.R. 31816), amended Section 23.1183(a) to require that lines and fittings and components carrying gas, air, or flammable fluids in any area subject to engine fire conditions must be at least fire resistant. That amendment also amended the heading of the section, while retaining the requirement that flexible hose assemblies must be approved. Therefore, the section as amended by this amendment, contains the provisions made effective by Amendment 23-14 in addition to those proposed in Notice 71-12, including the revision of the latter discussed below. Inasmuch

as the heading proposed in Notice 71-12 is inappropriate to the section as amended by Amendment 23-14, the heading adopted by the amendment is retained.

Stating that proposed Section 23.1183, which concerns engine fire protection, is inappropriately included with aircraft airworthiness standards, one commentator suggested that it more correctly belongs in Part 33 relating to engine airworthiness requirements. However, while this and other sections do relate to engine airworthiness, they are included also in Part 23 and the other aircraft certification parts since it is the intent that aircraft certificated under applications made after the adoption of these amendments conform to the new updated sections of Part 33 whether or not they incorporate engines type certificated under the updated Part 33. Thus, to cover cases where such aircraft incorporate engines certificated under applications made before adoption of these amendments, the new engine standards that are appropriate are made effective as to the aircraft by being incorporated in the aircraft airworthiness sections.

One commentator questioned whether integral oil sumps on smaller reciprocating engines were considered to come within the meaning of flammable fluid tanks as that term was used in proposed Section 23.1183. The FAA did not intend that they be included, and the rule as adopted specifically provides that integral oil sumps of less than 20 quart capacity need not be

fireproof nor be enclosed by a fireproof shield.

Proposal 8 -- As a result of the issuance of Amendment 23-14 (38 F.R. 31816), which contains new paragraphs, Section 23.1305(q) and (r), the proposed paragraphs (q), (r), (s), and (t) are redesignated (s), (t), (u), and (v), respectively. The following discussion is keyed to the new designations.

One commentator questioned whether the fuel strainer or filter indicator referred to in Section 23.1305(t) were required on all filters, even "last chance" filters. Consistent with the requirements applicable to the strainers or filters themselves, Section 23.1305(t) has been revised to make clear that the indicator required is for a fuel strainer or filter required under Section 23.997. Similarly, Section 23.1305(t) and (u) have been reworded in order to be consistent with Sections 23.997 and 23.1019, respectively, in regard to the degree of contamination that must be indicated. In response to a further comment, Section 23.1305(t) has been reworded to clarify that the desired indication is of the occurrence of contamination rather than the more stringent requirements of the degree of contamination as suggested in the Notice. This change achieves consistency between paragraphs (t) and (u).

One commentator questioned whether other presently installed gauges for other functions could be used as "indicators" to

indicate the functioning of a heater as required in paragraph (v). As discussed above, in connection with the indicators required for oil strainers or filters, the FAA anticipates that the requirement will be met by installation of gauges to indicate the functioning of heaters. However, if a clear and positive indication can be obtained from other gauges used to portray functions different than direct heater functioning, the requirements of the section are met.

PART 25 — AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

Proposed changes to Sections 25.951 (Proposal 1), 25.997 (Proposal 3), 25.1015 (Proposal 5), 25.1019 (Proposal 6), and 25.1093 (Proposal 7) were the subject of comments substantially the same as submitted for the proposed like-numbered sections of Part 23. As adopted, these Part 25 sections set forth the same requirements as proposed in Notice 71-12 except as they have been modified for the reasons given in the preamble discussion of the like-numbered Part 23 sections.

Proposal 2 -- No comments were received in response to the proposed deletion of Section 25.977(b). That paragraph is

accordingly revoked and marked reserved.

Proposal 4 -- The exemption contained in the last sentence of Section 25.1013(a), concerning fireproofing of an integral oil sump of less than 20-quart capacity on a reciprocating engine, has been removed from this section and placed in Section 25.1183(a). This action involves no substantive change and achieves consistency with the parallel Part 23 section.

Proposal 8 -- Section 25.1183(a) has been further amended in connection with changes to Section 25.1013(a) as noted under Proposal 4.

Proposal 9 -- Section 25.1305(c) has been amended so that it is substantively the same as the parallel provision of Section 23.1305. The related Part 23 preamble discussion is applicable. The proposed new subparagraph 25.1305(d)(3), concerning an indicator to indicate rotor system unbalance, has already been adopted by a separate rule-making action (Amdt. 25-35, 39 F.R. 1831).

One commentator stated that aircraft fuel systems have been designed without cockpit controlled fuel heat; therefore there is no need in proposed subparagraph (c)(8) for an indicator to indicate the proper functioning of any fuel heater. The section however only requires an indicator if a heater is used and the FAA believes it would supply necessary information to indicate heater functioning.

PART 27 — AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT

Proposed changes affecting Sections 27.951 (Proposal 1), 27.997 (Proposal 2), 27.1013 (Proposal 3), 27.1015 (Proposal 4), 27.1019 (Proposal 5), 27.1093 (Proposal 6), 27.1183 (Proposal 7), and 27.1305 (Proposal 8) were the subject of comments substantially the same as submitted for the proposed like-numbered sections of Part 23. The proposed amendments set forth in Notice 71-12 have been adopted except as explained in the preamble discussion of the like-numbered Part 23 sections.

PART 29 — AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY ROTORCRAFT

Proposed changes affecting Sections 29.951 (Proposal 1), 29.997 (Proposal 2), 29.1013 (Proposal 3), 29.1015 (Proposal 4), 29.1019 (Proposal 5), 29.1093 (Proposal 6), 29.1183 (Proposal 7), and 29.1305 (Proposal 8) were the subject of comments substantially the same as submitted for the proposed

like-numbered sections of Part 23. The proposed amendments set forth in Notice 71-12 have been adopted except as explained in the preamble discussion of the like-numbered Part 23 sections.

PART 33 — AIRWORTHINESS STANDARDS: AIRCRAFT ENGINES

Proposal 1 -- The comments received in response to proposed section 33.5 focused principally on the overhaul instructions that would be required by paragraph (e). The comments revealed widespread misunderstanding of the effect of requiring the engine manufacturer to set out the frequency of overhauls. In this connection, the FAA wishes to point out that overhaul instructions are necessary upon type certification because an engine might require overhaul at any time thereafter, and the ability to perform an overhaul should not be limited by lack of instructions. Furthermore, the manufacturer's statement of overhaul frequency is not established as an operating limitation but operates merely as a recommendation; it does not preclude the establishment of different overhaul intervals, nor does it preclude the "piecemeal" overhaul practice followed by operators using continuous airworthiness maintenance programs. It should be noted, however, that the initial overhaul time established under Section 33.90 and referred to in Section 33.7(c)(17) is an operating limitation that must be complied with regardless of the adoption of any other practice; the initial overhaul, whether accomplished "piecemeal" or otherwise, must be completed within the time established.

With regard to a question raised by one commentator concerning the requirements in Section 33.5(e)(2) that certain component life limits be specified in the required instructions, the FAA wishes to call attention to the fact that no separate requirement is thus established that would have any effect on

operators of the engines. The life limits of all components requiring replacement are established under other sections of Part 33 as operating limitations that must be complied with, and their publication in the required instructions is a convenience to operators.

Upon further review, Section 33.5(a)(1) is revised to include a requirement that the installation instructions contain the maximum allowable loads for engine mounting attachments and related structure, which are required to be determined in complying with Section 33.23. Similarly, Section 33.5(a)(2) is revised to include a requirement for description of the pipes, wires, cables, ducts, and cowling covered by that section. That information is considered essential for installation, and FAA practice has been to require it for compliance with prior Section 33.5.

Proposal 2 -- The effect of proposed Section 33.7 was misunderstood by a number of commentators who objected to various ratings and limitations listed therein. Contrary to the apparent belief of those commentators, no ratings or limitations would be established independently under Section 33.7; the section merely contains a list of ratings and limitations established either under applicable requirements of Part 33 that predate the Notice, or under proposed new requirements contained in the Notice. Consideration was thus given to the substance of the comments as they related to substantive requirements proposed in the Notice. Discussion of comments directed to Section 33.7 but relating to proposed new requirements is found with other comments under the appropriate section. However, as a result of such comments, one substantive change has been made that affects Section 33.7; no rating or limitation need be established for turbine engine internal cooling air flow, and proposed Section 33.7(c)(12) has therefore been deleted, with attendant necessary renumbering of the succeeding subparagraphs. Other changes of an editorial nature have been made for internal consistency between Section 33.7 and other Federal Aviation Regulations.

Proposal 3 -- No public comment was received on the proposed deletion of Section 33.13, and the section has been revoked and marked "reserved."

Proposal 4 -- Several comments were received that contained objections to the start-stop stress cycle described in proposed Section 33.14 as not being representative of a typical operating cycle that would produce the stresses to be accounted for by the requirement. In particular, there was objection to the requirement that disc and spacer temperatures be stabilized after stopping the engine in order to complete a cycle. The FAA agrees that final temperature stabilization should not be necessary where an applicant can show that the components experience the complete stress range without such stabilization, and the definition of a start-stop stress cycle as adopted includes a provision to allow for such a showing.

Another commentator suggested that the operating limitation be defined as the number of cycles to a detectable crack rather than to failure. The FAA regards a crack as a failure and the rule as adopted applies not only to cracks but to other types of failures which may occur prior to the occurrence of a detectable crack.

A commentator recommended that spacers be deleted from the section because they would not normally be critical. The FAA disagrees; spacers are a critical item in low cycle fatigue, and the requirement, in this regard, is adopted as proposed.

One commentator stated the belief that the establishment of component life limits would result in a complicated and time-consuming process for extending component life. The FAA points out that the listing of this limit on the type certificate as required by this section provides only an initial limit and will not in any way complicate the procedure for extending the limit. In this connection, the section as adopted is revised to clarify that the required operating limitations and the provision for increasing them apply individually to each rotor disc and spacer.

Proposal 5 -- Several commentators objected to the new standard of protection proposed in Section 33.17(b) for external lines, fittings, and components as necessary because the matter is adequately covered in paragraphs (a) and (c) of that section, while another commentator asserted that, due to considerations of airflow and venting, the requirement should be imposed only on the airframe. The FAA does not agree with these positions. The new requirement in (b) for protection against ignition of leaking flammable fluids is necessary to deal with possible impingement of such fluids on hot surfaces. Furthermore, since engine design necessarily includes considerations of airflow and venting, this requirement in Part 33 will assure that those considerations take account of possible ignition of leaking flammable fluid that could result from its impingement on engine components.

In response to comments questioning the applicability of proposed Section 33.17(c) to integral oil sumps on the smaller reciprocating engines, the requirement as adopted is revised to exclude such sumps having less than a 20-quart capacity. The requirement is thus made consistent with the parallel requirements in the aircraft airworthiness parts.

One commentator believed that a clear definition of "fireproof" and "fire resistant" was lacking in the regulations and suggested that temperature, duration and flame intensity should be specified as part of any definition. The definitions in Section 1.1 of the regulations include both "fireproof" and "fire resistant" and any further changes to these definitions would be outside the scope of the Notice.

One commentator questioned whether under paragraph (e), the

accumulation of fluid is interpreted as occurring inside of the engine and suggested that the section should specify unwanted

flammable fluid. The FAA agrees that the section is intended to refer to unwanted flammable fluid and is directed to areas internal to the engine. The requirement as adopted is reworded accordingly.

Proposal 6 -- The comments received in response to proposed Section 33.25 expressed general agreement with the intent of the requirement as understood by the commentators. However, several of the comments indicated a need for clarification regarding the applicability of limit loads to accessory drives and mounting attachments. The FAA agrees that the intent of the proposal was that the limit load requirement apply to accessory drives and mounting attachments and the section as adopted is reworded to make this clear.

In addition, as suggested by one commentator, a provision has been added to make clear that the use of engine oil for lubrication of accessory drives and mounting attachments is permitted, with appropriate sealing provisions.

Proposal 7 -- It was pointed out that reference to "excessive speed, temperature, and vibration" in proposed Section 33.27(a) was vague in view of the very specific requirements in proposed paragraph (d). Since it was the intent of the proposal to relate the two requirements, Section 33.27(a) as adopted is revised to clearly refer to the specific tests included in the section.

Several commentators objected to the speeds proposed in the overspeed tests required in Section 33.27. They expressed the opinion that the rotor speed strength demonstrations which are currently accepted by the FAA and which are 5 percent lower in all cases than the proposed requirements demonstrate an adequate margin of strength. In this connection, one commentator pointed to 6 million hours of service experience with no disc bursts. The FAA finds compelling merit in these comments and upon further consideration the overspeed requirements as adopted are 5 percent less than those proposed.

Several commentators believed that the proposal to use a test article fabricated with minimum qualities allowed by the specification was an impractical requirement. They expressed the opinion that to conform to the proposal as written would require a component made with all the minimum properties to the specifications, a condition which could not be met. The FAA agrees with these comments and upon further consideration has deleted the proposal.

Several commentators objected to the proposed paragraph (c)

of Section 33.27 regarding cooling airflow as being too restrictive. They pointed out that in designs where there is more than one cooling passage, one passage could be blocked and still allow passage of an adequate flow of cooling air. While this might be less than normal cooling airflow it might still ensure adequate cooling. The FAA agrees that the proposed requirement would not accomplish the intended purpose and, in connection with the deletion of other proposed requirements relating to cooling airflow that were determined to be impracticable (see discussion relating to Sections 33.7 and 33.87), the section is adopted without the proposed paragraph (c).

Proposal 8 -- One commentator expressed the opinion that the instrument connection markings required in proposed Section 33.29 would be unnecessary if it could be shown that there was no possibility of an instrument being connected to the wrong connection. The FAA agrees that this would satisfy the requirements of the rule and, accordingly, the section as adopted is revised to specifically allow this. In addition, the section has been revised by deletion of the word "new" which was inadvertently included in the proposal, to clarify that it applies to all engine limitations.

The proposed requirement relating to rotor system unbalance contained in proposed Section 33.29(b), as noted previously in this preamble, has been adopted in a separate rulemaking action (Amdt. 33-5; 39 F.R. 1831).

Proposal 9 -- The only public comment received in response to the proposed new Section 33.42 recommended deletion of the requirement but gave no reason for the recommendation. The section is adopted as proposed.

Proposal 10--A comment was received that questioned the speed range that would be applicable to the proposed requirement in Section 33.43(a) for a vibration survey with a cylinder not firing. As proposed, the requirement implies the same speed range that is applicable to the engine with all cylinders firing. The FAA agrees that this would be impractical and the requirement is revised to specify that the applicable speed range is from idle to maximum desired takeoff speed rating.

Several commentators questioned whether the vibration test survey specified in paragraph (a) required the same propeller used for the endurance test or a propeller of the same configuration. The FAA intended that the same configuration of propeller could be used for the tests and the rule as adopted is revised to clarify the intent for both propellers and loading devices.

One commentator recommended that Section 33.43(a) be revised to exclude the propeller shaft or other output shafts from the vibration survey. The FAA does not agree that they should be excluded since they are the most vital components requiring

vibration measurements and tests. However, this does not include any accessory drive shafts, which are required to be loaded under Section 33.43(c) in order to assess the effects of such loads on the propeller or other output shaft.

One commentator regarded that the number of cycles to demonstrate compliance for fatigue testing of steel shafts specified in Section 33.43(b) should be 10 million rather than 10 1/2 million cycles. The FAA agrees that 10 million cycles represents an accepted standard and the requirement is revised accordingly.

A commentator recommended that Section 33.43(c) which requires accessories to be loaded during the vibration tests be deleted as being unnecessary for torsional surveys. The FAA does not agree; the purpose of the test is to disclose possible adverse vibration effects, including any that might be contributed by accessories.

Proposal 11 -- Several commentators objected to the proposed Section 33.45(b) requirement for a recalibration after the endurance test as being impracticable and unnecessarily adding to the endurance test. They suggested that the intent of the section, to ensure that any power loss during the endurance test be determined, could be met by modifying the rule to require a "power check" in place of a recalibration. The FAA agrees that a full recalibration is not required to determine power loss and the section is revised to require a power check in place of a recalibration. In addition, since the section permits use of measurements taken during the final portion of the endurance test, reference to the finish of that test has been deleted.

Proposal 12 -- Upon further consideration, the parenthetical statement in the first sentence of paragraph (a) of proposed Section 33.49 is revised to clarify that the additional testing requirements that apply to a turbosupercharger are completely covered in Section 33.49(e)(1)(iii) (proposed Section 33.49(e)(1)(iv)). An applicant may elect to run the engine-turbosupercharger combination an additional 50 hours in complying with that requirement, but it is not necessary to do so.

One commentator felt that in Section 33.49, the accessory loading provision referred to in paragraph (a) could be interpreted to require the limit load to be applied during all operations. The intent of this rule is to require limit loads only during operation at rated maximum continuous power and rated takeoff power, and the section is revised accordingly.

One commentator recommended that instead of requiring maximum cylinder temperatures during all of the endurance running at maximum and takeoff powers that a shorter time period would adequately demonstrate cylinder assembly integrity. The FAA

agrees with the recommendation and the rule as adopted requires testing with cylinder and oil inlet temperatures specified, for 35 hours, the time currently used in certification practice. Furthermore, the FAA agrees with another commentator that as long as the cylinder temperatures are monitored the intent of the section will be met, and the requirement is revised to refer to cylinder temperature, deleting reference to the cylinder barrel and head.

A commentator recommended that the altitude testing requirements for turbosupercharged engines be deleted and the tests be run at sea level condition. The FAA does not agree. The altitude testing requirements are necessary. However, the section as adopted is revised by rewording the lead-in sentence of Section 33.49(e) to allow as an alternative that altitude tests may be simulated, and by deleting proposed Section 33.49(e)(1)(iii).

Proposal 13 -- Several commentators objected that the proposed requirement in Section 33.55(b) that all adjustment settings and functioning characteristics that can be established independent of installation on the engine be unchanged at teardown is unnecessarily restrictive. The FAA agrees that the intent of the proposal would be satisfied if those functioning characteristics remain within limits established at the beginning of the endurance test, and the requirement is revised accordingly.

Several commentators believed that the requirement proposed in Section 33.55(c) that components conform to the type design after the endurance test was too severe, especially since this would require parts to remain within drawing tolerances. The FAA does not agree. The type design includes dimensions within which a component may change in service. A component that sustains wear beyond those limits during a 150-hour endurance test has not met minimum airworthiness standards.

Proposal 14 -- The last sentence of Section 33.57(b) as proposed is amended to require the engine "or" its parts to be subjected to additional tests if required instead of the engine "and" its parts.

As discussed in connection with Proposal 1 of Part 21, new Section 33.62 is added to require stress analysis of certain engine parts.

Proposal 15 -- A commentator recommended revision of proposed Section 33.65 to include reference to the allowable engine operating limitations in order to clarify that there could not be a finding of noncompliance if any of the undesired effects resulted from operations beyond those limitations. The section is intended to apply only to operations that are within allowable operating limitations as set forth in the manufacturer's operating instructions and the requirement is revised to make this clear.

In addition, the section is revised to delete the reference to inlet air distortion caused by cross-wind, which is adequately covered by the manufacturer's specification of limiting inlet air distortion, and to ice ingestion, which is adequately covered by other requirements.

Proposal 16 -- Several commentators recommended that Section 33.66 be clarified to avoid the interpretation that a reduction in engine performance due to bleed air would be an "adverse effect on the engine." To preclude this possible misinterpretation, the section is revised accordingly.

Proposal 17 -- Several commentators suggested that paragraph (a) of Section 33.67 be revised to allow for the use of seals and locking devices as alternatives to making the fuel control adjusting means inaccessible. The FAA agrees that these alternative means be used to achieve the desired intent and the section is revised accordingly.

Several commentators expressed doubt that it should be necessary to add any water to saturated fuel since upon cooling the saturated water would precipitate out, thus representing the most critical condition. The FAA does not agree that the amount of water which may precipitate out properly represents the most critical amount of free water possible in the system. The added water is necessary to simulate critical conditions.

Several commentators expressed doubt that Section 33.67(b)(6) could be literally complied with and suggested that the aim of the rule was that all means be taken to prevent the release of contaminants, and that an insignificant amount of contaminant release should not violate the rule. The FAA agrees with this comment and the rule as adopted requires design of the bypass to minimize release of contaminants.

Other revisions to the section have been made for the reasons set forth in the discussion relating to Section 23.997, which contains like requirements.

Proposal 18 -- The comments received in response to proposed Section 33.68 were similar to those received in connection with the substantively similar provisions contained in Proposal 6 of Part 23, Section 23.1093. The section is revised in accordance with the discussion pertaining to revisions of that section.

Proposal 19 -- Several commentators objected to the requirement in Section 33.69 for two igniters; however, this is the requirement of the present rule and the only proposed change to the rule is the requirement for a single igniter for fuel augmentation systems. No objections were received to this provision.

Proposal 20 -- Several commentators objected to the requirement in Section 33.71(b)(6) for cockpit indication of oil

filter contamination, where no bypass is incorporated. However, the FAA considers the addition of a cockpit indicator to be necessary in the interest of safety in order to enable the flight crew to prevent engine failure due to oil starvation, that might occur if all required filters in the lubrication system do not incorporate the protection of a filter bypass.

As indicated by other commentators, the words "extreme temperature" as used in proposed Section 33.71(c)(9) could be taken to require compliance at temperatures beyond the intended operating range. Such a result would be contrary to the intent of the requirement and the section as adopted is revised to refer to maximum operating temperature. In response to other comments the differential pressure requirement in subparagraph (c)(9) is reworded to clarify that it may not be less than 5 p.s.i. above the maximum operating pressure of the tank.

One commentator considered that the lack of a requirement for a bypass was a serious deficiency in the proposal. The FAA has considered this question many times including extensive discussion at government-industry airworthiness meetings and has determined that due to the serious divergence of opinion the use of a bypass should at present be optional. If no bypass is used, however, the applicant must comply with other safeguards contained in the section to ensure safe operation of the lubrication system.

The remainder of the comments were similar to those made in response to Proposals 3, 4, and 5 of Part 23 and have been responded to in discussion of those proposals. The section has been reworded in part to conform with the changes made to the sections involved in those proposals.

Proposal 21 -- One commentator recommended that Section 33.72 should refer to a "main" filter only. The FAA does not agree; the requirements are meant to apply to each filter or screen incorporated in the system.

Proposal 22 -- Several commentators believed that Section 33.75 as written was confusing and ambiguous. The printed notice was incorrectly worded and the section is rewritten to read correctly.

Several commentators suggested that the word "burst" in subparagraph (b) was ambiguous and needed further definition. The FAA agrees and, accordingly, a further descriptive phrase, "penetrate its case," is added.

One commentator suggested that the phrase "improper operations" be substituted for "bad operation". The FAA agrees with the suggestion and the section incorporates this change.

One commentator objected to consideration of multiple failures, to avoid consideration of an infinite number of possible failures. The analysis however does not require that

all possible multiple failures be considered, but uses the accepted standard of consideration of only the probable single or multiple failures.

Proposal 23 -- One commentator suggested that Section 33.77(a)(2) be clarified to ensure that a burst meant uncontained burst that penetrates the case. The FAA agrees that this is the intent of the section and it is revised accordingly.

Several commentators suggested that the footnote to the table be modified to permit the option of demonstrating containment on a component basis for all the test items. The FAA does not agree that this would adequately account for secondary effects except in the case of blade containment in fan engines as noted.

Several commentators expressed doubt that the proposed rate of ingestion of 1 1/2 pound birds was supported by ornithological data or actual flight experience. They suggested that a lesser rate be used. The FAA, after further study and consideration, agrees. Accordingly, the ingestion rate of 1 1/2 pound birds is established at one for the first 300 square inches of inlet area and at one for each 600 additional square inches or fraction thereof, of up to a maximum of 8 birds.

The practical reality of a 4-inch hailstone was questioned in some of the comments. The FAA, after further study, has determined that this size will probably not be encountered in actual flight conditions and the section is amended to delete the requirement.

Several commentators believed that the amount of sand and gravel specified was excessive and not representative of actual conditions. After further consideration, the FAA agrees that the amount proposed should be reduced and the section is revised accordingly.

The FAA agrees with the point raised by several commentators that, in Section 33.77(c), some power or thrust loss should be permitted since the ingestion of these objects will certainly cause a temporary power loss. Accordingly, the requirement is revised to permit power or thrust loss that is not "sustained." In addition, Section 33.77(f) is revised, upon further consideration, to require testing of water ingestion to take place under takeoff operating conditions rather than the proposed "maximum cruise." This reflects current practice in engine certification.

The 1/4 by 1 inch bolt test is deleted since the test for the broken rotor blade is a more stringent test and will adequately account for the effects of the bolt.

A comment was received that objected to the provision in proposed Section 33.77(d)(3) relating to obstruction of induction airflow by foreign objects that are stopped by a protective

device. The FAA wishes to point out that the subject provision does not state a requirement that must be met by all applicants. Rather, it provides an alternative to testing for the effects of objects that can be stopped by a protective device and prevented, by deflection out of the airflow path or by some other means, from obstructing the induction airflow in any way.

In addition, a new paragraph (e) is included in Section 33.77 to incorporate the suggestion offered by some commentators that the effects of ingestion of some foreign objects can be accounted for by the effects of others. Thus, in showing compliance with Section 33.77(a) the applicant is required to test only for that object that is shown to have the most severe effect. Similarly, for compliance with (b), testing is required for sand and gravel and either the 3 ounce or 1 1/2 pound birds, depending on the size of the engine inlet, as designated in Section 33.77(f).

Proposed paragraph (e) is redesignated as paragraph (f).

Proposal 24 -- One commentator recommended that in Section 33.79(a) an acceptable means of compliance to demonstrate cooling be provided for the guidance of the applicant. The FAA, upon further consideration agrees that the section does not adequately establish a definable objective and the proposal is withdrawn for further study. Proposed paragraphs (b) through (f) are redesignated (a) through (e), respectively.

One commentator believed that paragraph (e) of the proposed rule could be misinterpreted as allowing a loss of thrust to the unaugmented engine in an amount equal to that added by the augmentor. To avoid possible misinterpretation, the requirement, adopted in Section 33.79(d), is reworded to clarify that the loss of thrust mentioned means only the thrust that is provided by augmentation. Furthermore, upon further consideration, the FAA has revised the requirement to refer only to failure or malfunction of augmentor combustion, since the effects of other possible augmentor failures on engine thrust cannot be reliably predicted.

One commentator recommended clarification of proposed paragraph (f) to ensure that the rotational speed mentioned be the minimum rotational speed at which the thrust augmentation functions. This is the original intent of the paragraph and it is modified accordingly.

Proposal 25 -- One commentator pointed out an error in the explanation of proposed changes to Section 33.81. Instead of referring to Section 33.43, it should have referred to Section 33.87. No change to the adopted rule itself is necessary, however.

Proposal 26 -- No comments were received on the proposed new Section 33.82, and the section is adopted as proposed.

Proposal 27 -- Several commentators recommended that the requirement in Section 33.83 for testing to 110 percent of the desired maximum continuous speed rating be deleted because certain high performance turbine engines may not be capable of achieving this overspeed condition. Upon further consideration, the FAA agrees with the commentators' position and the requirement is deleted.

Other revisions to the section have been made for the reasons set forth in the discussion relating to Section 33.43, which contains like requirements.

Proposal 28 -- Revisions have been made to Section 33.85 for the reasons set forth in the discussion relating to Section 33.45, which contains like requirements.

Proposal 29 -- Several commentators requested that the surface temperature requirement be deleted from proposed Section 33.87(a)(3) as being difficult to simulate on a test stand. The section is intended by the FAA to require that if an engine external temperature limit be specified by the applicant as being critical, then the applicant must demonstrate satisfactory operation at that temperature. It is pointed out that only those temperatures specified by the applicant need be held at their specified values and the requirement is reworded to clarify this. In addition, the section is revised to provide allowance for more than one test run if all parameters cannot be held at the required values simultaneously.

Several commentators objected to subparagraph (a)(4) of Section 33.87 which had called for fuels, lubricants, and hydraulic fluids with the lowest thermal breakdown temperatures allowed by their specifications to be used during the tests. They felt that this was practically an impossible requirement because of the unavailability of fluids and lubricants with all the minimum properties called for. The FAA agrees, and the requirement is revised to call for specified fluids and lubricants used during the endurance tests to conform to their respective specifications.

One commentator suggested that Section 33.87(a)(6) be amended to require that only shear and overload loads be tested and that the requirement for other loading during the endurance tests be deleted. The FAA does not agree, but intended that the endurance test simulate actual operation and include testing of the accessories drives themselves as well as other portions of the engine. This requires loading of those drives, and the rule is adopted as proposed.

Several commentators questioned whether the limit load for accessories specified in subparagraph (a)(6) should apply only during maximum power operation. This is the intended construction of the section, and it is amended to reflect this intent.

One commentator expressed concern that compliance with Section 33.87(a)(8) which calls for cooling air simulation could not be demonstrated since in a particular engine there may be many divisions of cooling air-flow which might make it virtually impossible to individually regulate each separate cooling airflow path. The FAA agrees with the commentator's position and the proposal is withdrawn for further study.

Several commentators suggested that the references to supersonic engines be deleted because of the lack of foreseeable need for such engines. The FAA does not agree. One of the purposes in formulating these new amendments is to establish standards for that new generation of engines, especially since the FAA is in the process of presently certificating such engines.

One commentator pointed out that the proposal did not include the false start tests of the present rule. This was an inadvertent omission and those false start tests are included in the adopted rule.

Proposal 30 -- The phrase "for installation in an engine" is deleted from Section 33.88 as being surplusage.

Proposal 31 -- One commentator requested that a better definition be used in Section 33.89(b) for the term "extreme ambient temperature and altitude." The FAA agrees that, taken literally, the requirement could be unnecessarily burdensome. Accordingly, the wording is modified to read "maximum and minimum operating ambient temperature" and "maximum operating altitude." In addition, upon further consideration, the last sentence of the proposed requirement is deleted as unnecessary.

Proposal 32 -- One commentator believed that for the overhaul test of section 33.90 two starts per hour was unnecessarily severe and suggested that a number representative of intended operation might be substituted for the stated requirement. The FAA agrees that if the applicant could show that a lesser number of starts would be more representative of intended operation for the particular engine that this would adequately comply with the intent of the section, and the section is revised accordingly. Furthermore, since this revision eliminates the distinction in the section between airplane and rotorcraft engines, the requirement is expressed in a single paragraph, rather than in (a) and (b) as proposed.

In response to several comments, Section 33.90 as adopted is revised to clarify that the requirement applies only to engines being originally type certificated; it does not apply to engines being certificated through amendments to existing type certificates or through supplemental type certification procedures.

Several commentators recommended deleting the entire section as proposed. They expressed the opinion that it was unreasonable

to require the completion of an overhaul test in addition to the endurance test as a condition of type certification and believed that past practices were adequate to establish an initial overhaul period. One commentator stated that the 150 hour endurance test, because of its accelerated nature, should be equivalent to a 1000 hour overhaul period. The FAA does not agree. This additional overhaul test is necessary since experience on certain engines has shown that the endurance test has not been equivalent to longer service operations, especially for periods as long as 1000 hours.

Proposal 33 -- Several commentators pointed out that the oil tank requirement in paragraph (c) of proposed Section 33.91 was redundant with a similar proposed requirement in proposed Section 33.71(c)(9). The specified test requirements for oil tanks are covered under Section 33.71(c)(9) and reference to oil tanks is, therefore, not included in Section 33.91(c) as adopted. References to "extreme temperature" and "the sum of 5 p.s.i. and the maximum operating pressure" in the requirements specified in Section 33.91(c) have been revised for reasons discussed in connection with Proposal 20, this Part (Section 33.71). In addition, and for the same reason, references to "extreme temperature" in Section 33.91(d) have been replaced by "maximum and minimum operating temperature", and the requirement to test while cycling operating conditions from "one extreme to another" has been rewritten to require cycling between maximum and minimum operating conditions.

Proposal 34 -- Several commentators expressed the opinion that the tests required under Section 33.92 are unnecessary for engines that are to be used in single engine aircraft. One commentator further suggested that the time period of 3 hours may not be appropriate to a practical situation but rather, the time period and r.p.m. should be based upon the conditions arising from a recommended flight technique following an engine failure at a critical point in the flight path. Another commentator expressed doubt that windmilling for 3 hours without oil was a normal expectancy. The FAA does not agree. It is not possible, at the time of certification, to know the end use or particular intended flight conditions for each engine. It is therefore necessary to establish a general criterion which will adequately demonstrate a degree of safety for conditions that a turbine engine would likely encounter on a typical and usual route structure. The 3 hour time period specified does represent a time period representative of an expected route structure and windmilling for 3 hours without oil is a reasonable possibility.

One commentator recommended that the proposed rule be clarified to specifically allow for the engine windmilling speed to either decrease or stop due to freezing of bearings. The proposal as written does not specifically mention this condition. However, the FAA agrees that this would be a satisfactory means of accomplishing the intent of the section and the rule is revised to allow for this condition.

One commentator recommended deletion of the entire section because he believed there was insufficient experience pointing out a need for these tests and because the proposal implies a flight test as a condition of engine certification. The FAA finds that experience establishes the need for these tests and points out that flight tests are not specifically required by the rule.

Proposal 35 -- The changes to Section 33.93 are similar to those made for Section 33.55, which was the subject of similar comments. The changes and comments are discussed in connection with Proposal 13, this Part.

Proposal 36 -- The changes to Section 33.99 are similar to those made for Section 33.57, which was the subject of similar comments. The changes and comments are discussed in connection with Proposal 14, this Part.

Finally, it should be noted that a number of the rule changes contained in this amendment deal with subjects for which proposals were received for inclusion in the 1974-75 Airworthiness Review Program (Notice 74-5; 39 F.R. 5785). As indicated in that Notice and in Notice 74-5A (39 F.R. 18662), inviting comment on the proposals received, rule making procedures separate from the Airworthiness Review could result in removal of proposals from further consideration during the Airworthiness Review Program. The FAA has determined that the following FAA proposals presently being processed in the 1974-75 Airworthiness Review relate to issues that are covered by the rules adopted by these amendments, and need not, and will not, be given further consideration during the 1974-75 Airworthiness Review:

Proposal No.	FAR's	Subject
677 (with respect to proposed paragraph (q) only)	§ 23.1305	Powerplant instruments
752	§ 25.997	Fuel strainer or filter
784	§ 25.1305	Powerplant instruments
863	§ 27.1305	Powerplant instruments
941	§ 29.1183	Lines and fittings
947	§ 29.1305	Powerplant instruments

These amendments are made under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, Parts 1, 21, 23, 25, 27, 29, and 33 of the Federal Aviation Regulations are amended as follows, effective October 31, 1974.

Amendment 21-41

Parts Manufacturer Approvals

Adopted: November 27, 1974 Effective: January 4, 1975

(Published in 39 F.R. 41964, December 4, 1974)

The purpose of this amendment to Part 21 of the Federal Aviation Regulations is to delete the requirement that a person who holds a Parts Manufacturer Approval (PMA) must be the manufacturer of the part covered by the PMA.

This amendment is based on a Notice of Proposed Rule Making (Notice No. 74-24) published in the Federal Register on July 1, 1974 (39 F.R. 24236). Numerous comments were received in response to the Notice, and the FAA's disposition of comments is discussed below.

The proposals contained in Notice 74-24 had the following three major objectives:

(1) To permit PMA's to be issued to, and retained by, persons not engaged in any of the manufacturing involved in the production of the parts covered by the PMA.

(2) To continue the requirement that the FAA be provided a list, maintained current within ten days, of the name and address of each facility at which manufacturing involved in the production of the part would be accomplished, and to clearly state that the FAA's authority under Section 21.303 to make any inspections and tests necessary to determine compliance with the applicable regulations includes those that the FAA determines need to be conducted at any manufacturing facility.

(3) To provide for specific FAA approval of PMA Fabrication Inspection Systems (FIS's).

There was only a single comment, containing no supporting information or arguments, opposed to the first objective. Accordingly, to meet that objective, Section 21.303(a) is amended to require only that the person producing a modification or replacement part do so pursuant to a PMA. This will permit PMA's to be issued to any person who establishes and maintains a FIS under which the part is produced whether or not that person is the manufacturer.

A large number of the commentators objected to the proposals

that would implement the second two stated objectives. In general, those objecting to the requirement that a list, current within 10 days, be maintained of all manufacturing facilities involved in the production of a part stated that there was

ordinarily a rapid turnover of subcontracting facilities and that the proposed requirement would be an unnecessary paperwork burden for both PMA holders and the FAA. Furthermore, many of those objecting expressed concern over the expected reaction of many subcontractors and suppliers to any requirement that their facilities and operations be made available for inspection by the FAA. It was alleged that those subcontractors and suppliers because of the relatively small volume of business involved, would refuse to do business with PMA holders under such constraints. In addition, many of those commentators expressed concern that subcontractors and suppliers would react in a similar manner if required to implement a PMA holder's FIS in connection with the production of items to be delivered to the holder.

These comments reflect a misunderstanding of both the present rule and the proposals contained in the Notice. The proposals relating to maintaining a list of manufacturing facilities, to inspections conducted at any manufacturing facility, and to implementation of a PMA holder's FIS at any manufacturing facility did not include new substantive requirements. Section 21.303(c)(2) requires an applicant for a PMA to submit the name and address of the manufacturing facilities at which the parts are to be manufactured, and Section 21.303(j) requires the PMA holder to notify the FAA within 10 days of any changes in the location of those facilities, including additional facilities. Furthermore, Section 21.303 provides that the Administrator may make any inspections and tests necessary to determine compliance with the applicable FAR's. While it may be possible in many cases to conduct all of the required inspections and tests at the PMA holder's facility, the FAA pursuant to its responsibilities under the Federal Aviation Act, must retain the right to perform inspections and tests at any facility utilized in production under a PMA. With regard to implementation of a PMA holder's FIS at any manufacturing facility, it should be noted that Section 21.303(h) prior to this amendment stated that "Each person manufacturing... parts under a Parts Manufacturer Approval shall establish and maintain a fabrication inspection system that ensures that each part conforms to the design data and is safe for installation on type certificated products..." That provision specifically required, among other things, determination of the condition of incoming materials, inspection of parts in process at points where accurate determination of conformity can be made, and

segregation of rejected materials and components. The revision of paragraph (h) adopted by this amendment makes clear the present requirement that the PMA holder shall establish and maintain an FIS which assures that parts manufactured under that FIS conform to the design data, and are safe for installation on type certificated products. Thus, under both the current rule and this amendment the PMA holder has the responsibility of ensuring that all of the manufacturing is accomplished in accordance with his FIS. The revision makes no change with respect to the standards that the FIS must meet or the

inspections and procedures that may be necessary to implement the FIS. Contrary, however, to the belief expressed by some commentators with respect to implementing an FIS, the FAA does not agree that the requirements can be met as to all PMA parts without some required FIS inspections being conducted at supplier manufacturing facilities. Furthermore, it should be noted that nothing in the rule prevents a PMA applicant or holder from adopting, as part of its FIS, the inspection or quality control system of the person performing the manufacturing if the system meets the requirements of the regulations.

Most commentators had no objection in principle to the proposals related to FAA approval of FIS's. A number of them, however, expressed the opinion that the FIS requirements should be made as consistent as possible with the requirements applicable to other FAA production approvals. The FAA agrees. Accordingly, those proposals are withdrawn for further study and future rulemaking action.

In addition to commenting on the changes to the regulations proposed by the FAA in Notice 74-24, a number of commentators requested other changes pertaining to FAA design and production approvals, including revision of the regulations (1) to require all applicants for PMA's to submit the design data, test reports, and computations necessary to establish that the design of the part meets the applicable airworthiness requirements, by deleting from Section 21.303(c)(4) the provision permitting the use of the comparative method of establishing conformity to the design data; (2) to require full and accurate identification of PMA parts, units or assemblies incorporating PMA parts, and that such information be entered in the maintenance records of the aircraft and aircraft engines in which the parts are installed; and (3) to permit the holders of other FAA production appropals to use the statistical quality control procedures now authorized for PMA holders in Section 21.303(h)(5), or to delete such authorization from that section.

The FAA appreciates all comments received in response to

Notice 74-24 and they will be considered in the FAA study referred to above.

Finally, it is noted that some commentators expressed interest in a public hearing prior to FAA action on certain of the proposals contained in Notice 74-24. Inasmuch as this amendment does not adopt any of the proposals to which those persons objected, such a hearing is unnecessary.

This amendment is made under the authority of Sections 313(a), 601, and 603 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1423), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, and for the reasons set forth in Notice 74-24 except as modified herein, Part 21 of the

Federal Aviation Regulations is amended, effective January 4, 1975.

Amendment 21-42

Noise Standards for Propeller Driven Small Airplanes

Adopted: December 31, 1974 Effective: February 7, 1975

(Published in 40 F.R. 1029, January 6, 1975)

The purpose of these amendments is to prescribe noise standards for the issue of normal, utility, acrobatic, transport, and restricted category type certificate for propeller driven small airplanes; to prescribe noise standards for the issue of standard airworthiness certificates and restricted category airworthiness certificates for newly produced propeller driven small airplanes of older type designs; and to prohibit "acoustical changes," in the type design of those airplanes, that increase their noise levels beyond specified limits.

The primary basis for these amendments is Section 611 of the Federal Aviation Act of 1958 (49 U.S.C. 1431), as amended by the Noise Control Act of 1972 (P.L. 92-574).

These amendments are based on Notice 73-26, published in the Federal Register on October 10, 1973 (38 F.R. 23016). Interested persons have been afforded an opportunity to comment on the matters contained herein, and all relevant comments have been considered in the issuance of these amendments.

Pursuant to 49 U.S.C. 1431(b)(1), the Federal Aviation Administration has consulted with the Secretary of Transportation, concerning all matters contained herein, prior to the adoption of this amendment. Pursuant to that paragraph and Section 1500.9(b) of the guidelines of the Council on Environmental Quality concerning statements on proposed Federal actions affecting the environment, published in the Federal Register on August 1, 1973 (38 F.R. 20550), the Federal Aviation Administration has consulted with the Environmental Protection Agency (EPA) and has submitted this amendment to that agency for review and comment.

Background: Relation to Proposed Regulations Submitted to FAA by EPA.

During the period of FAA consultation with EPA on this amendment, EPA transmitted to the FAA (on December 6, 1974), its proposed regulation concerning the noise of propeller driven small airplanes, pursuant to Section 611(c)(1) of the Federal Aviation Act of 1958, as amended by the Noise Control Act of 1972. (P.L. 92-574). Section 611(c)(1) of the Federal Aviation Act of 1958 provides that EPA shall submit to the FAA proposed

regulations to provide such control and abatement of aircraft noise and sonic boom as EPA determines is necessary to protect the public health and welfare. That section also provides that the FAA "shall consider such proposed regulations submitted by EPA under this paragraph and shall, within thirty days of its submission to the FAA, publish the proposed regulations in a Notice of Proposed Rule Making." Pursuant to that provision of law, a Notice of Proposed Rule Making, entitled "Proposed Regulations submitted to the FAA by the Environmental Protection Agency: Noise Standards for Propeller Driven Small Airplanes" is being issued by the FAA simultaneously with this amendment. A detailed project report, dated November 25, 1974, was also transmitted to the FAA by EPA to support its proposed regulations. Since receiving the EPA proposed regulation and supporting project report (and in view of the fact that this amendment, representing a year of FAA analysis and review of public comments in response to Notice 73-26, was ready for issuance when the EPA proposal was received), the FAA has conducted a comparative study of the EPA proposal (and its supporting project report), and the provisions of this amendment. This study was conducted to determine whether issuance of this amendment at this time would in any manner commit the FAA to a course of action that would conflict with an objective review of the EPA proposals under the procedures prescribed in Section 611(c) of the Federal Aviation Act of 1958, or in any other way impair its ability to discharge its obligations under the Noise Control Act of 1972.

This review concentrated on the areas in which the EPA proposal may differ from this amendment with respect to the protection of persons from the noise of propeller driven small airplanes. The study, thus, concentrated on differences involving (1) the unit of noise measurement, (2) the compliance **DATES**, (3) the noise levels for each affected airplane weight, (4) the climb performance correction procedure, (5) the treatment of agricultural and firefighting airplanes, (6) weight limitations derived from the noise compliance test, (7) the effect of wind on conduct of the noise test, (8) correction of test data for microphone losses, (9) the supplementing of field calibrations with the use of a voltage insert device, (10) the engine power that must be used, and (11) the methods of correcting acoustical and performance information. The review of these eleven areas was conducted in the light of EPA's supporting data in its Project Report.

Based on this review, the FAA is confident that there is no provision of the EPA proposals submitted on December 6, 1974, that could not be adopted later, as a supplement to this amendment, if justified on the basis of public participation and comment in response to the NPRM being issued simultaneously with this amendment, and in response to Public Hearings conducted on that NPRM. Furthermore, the FAA, by issuing this amendment at this time, has no way limited its ability or intent to respond fully to the corresponding EPA proposals in a manner contemplated by Section 611(c) of the Federal Aviation Act of 1958.

In addition to preserving FAA's ability to take any action that may be shown to be valid under the Section 611(c) process, this amendment reflects FAA's awareness of the need for timely action to protect the public from the noise of propeller driven small airplanes. This amendment, thus, establishes immediate criteria for the manufacturers of propeller driven small airplanes, consistent with the direction in Section 611(b) that the public be protected from aircraft noise.

FAA's decision to issue this amendment at this time was coordinated with EPA. That agency stated that it had no objection to such issuance provided that it is understood that (1) this amendment may be changed on the basis of comments received in response to the EPA proposals (issued as an FAA NPRM simultaneously with this amendment) and (2) while EPA does not object to issuance of this amendment, it does not concur in the substance of this amendment.

EPA also requested that the FAA explain, in this preamble, its reasons for issuing this amendment at this time. These reasons are stated above, and may be summarized as follows: Considering the public need for timely action and the fact that all of the provisions of the corresponding EPA proposals that are shown to be valid can be fully and objectively considered for subsequent FAA rule making, the FAA believes that it would be contrary to the public interest, and to the intent of the Noise Control Act of 1972, to delay this immediately available regulatory action until the regulatory process prescribed in section 611(c) is completed anew with respect to the recent EPA proposals.

Finally, in response to Notice 73-26, EPA submitted, on December 20, 1973, its comments in the form of a comprehensive project report. This amendment is issued after analysis of that project report. A **SUMMARY** of FAA responses to that project report has been prepared in support of this amendment. However, since this earlier project report has been superseded by the later EPA proposal and project report, it is now moot. This **SUMMARY** has, therefore, been placed in the docket as history and is not recited in this preamble. To prevent confusion, and unless otherwise noted, all FAA responses to EPA's submittals in this matter will be related to EPA's second project report (dated November 25, 1974) and its proposed regulation.

Public Comments on Notice 73-26

One comment stated that the acoustical change provisions of the proposed regulations would result in unwarranted constraints on operators of antique aircraft. It was argued that powerplant conversions of antique aircraft are necessitated by the unreliability of the original model engine or are desirable either to substitute alternate engines offered as original equipment by the manufacturer, or to achieve more performance. The FAA believes that, for antique

aircraft that cannot achieve the noise limits of Section F36.301(b) prior to the change in type design, no valid reason has been submitted for permitting further noise increases. If the antique aircraft is quieter than those limits prior to the change in type design, this amendment permits noise increases up to that limit.

In either case, the FAA will monitor the burden of the regulation on antique aircraft to determine if the problem of aging aircraft justifies further review of the noise limits proposed herein. The commentator also stated that the acoustical change proposal appears to prohibit powerplant conversions that do not involve issuance of a supplemental type certificate. It was stated that this would be an unwarranted burden on antique aircraft owners. The general answer to this comment is stated above. The commentator is correct in that the acoustical change provisions of this proposal apply to the issuance of any type design change approval, not only the issuance of supplemental type certificates.

One comment stated that it was not clear whether the proposed acoustical change provisions applied only to aircraft type certificates under the proposed rules, or whether they apply also to older aircraft. As stated in Section 36.1(e), this amendment applies to the issuance of certain airworthiness certificates for new production versions of older aircraft types, not only to the issuance of new type certificates.

One comment stated that the acoustical change rules were proposed in such a manner that the tests required by Part 36, Appendix F, must be conducted by persons authorized to perform functions under Part 43 Maintenance, Preventive Maintenance, Rebuilding, and Alteration. This comment is not correct. The acoustical change provisions of Part 36 are limited by the terms of Section 21.93 to changes in the type design of an aircraft. These provisions do not change, in any respect, the provisions of Part 43 concerning alteration of aircraft to conform to changes in type design that have already been approved. The acoustical change requirements in this amendment must be met, however, as a condition for the issuance of type design change approvals after the effective date of this amendment. The commentator also stated that no person has been identified as having noise compliance testing authority under Part 43. Since the approval of type design changes is the function of the Administrator or his designated representative, and is not the function of persons authorized to perform alterations under Part 43, it would not be appropriate, at this time, to designate persons under Part 43 to conduct the required tests.

One comment stated that the proposed acoustical change provisions place an expensive and time consuming burden on aircraft modifiers because of the required climatic conditions. This comment recommended that testing not be required unless there is "reasonable evidence" that the modification will result in noise levels exceeding the regulatory limit. The climatic

conditions proposed within which no corrections for temperature and humidity are required cannot be expanded due to the need for consistent and reproducible results. The applicant has the choice of waiting for the test window, conducting the test in a more favorable climate, or correcting the data if the tests are conducted outside the "no correction test window." Further, the design changes which constitute an acoustical change for propeller driven small airplanes are delineated in Section 21.93(b)(3). If the type design change is an "acoustical change" under the above section, the FAA believes that reasonable evidence does exist that modification may result in increased noise. For this reason, this amendment requires that the acoustical change compliance test be conducted.

One comment stated that the acoustical change provisions should only apply to aircraft exceeding a specified horsepower/propeller or horsepower/RPM combination. Section 21.93(b)(3) specifies the alterations that constitute an acoustical change. Because of the range of noise levels and propulsion systems addressed by this amendment, it would be unworkable to attempt to specify horsepower/propeller or horsepower/RPM combinations that would adequately describe the type design changes that may result in noise increases.

One comment stated that acrobatic aircraft should be excluded from the regulations on the same basis as agricultural and fire fighting aircraft since acrobatic aircraft also need all available horsepower and any noise related power losses would result in an unacceptable tradeoff between safety and noise reductions. The FAA does not believe that the fact that an aircraft is type certificated in the acrobatic category under Part 23 of the Federal Aviation Regulations justifies exclusion of the aircraft from noise rules. It should be noted, however, that this amendment does not apply to experimentally certificated aircraft used for acrobatics.

One comment stated that the type certification noise standards, while essential, must be supplemented with operational procedures in order to ensure adequate noise control. This comment stated that all airplane flight manuals should contain a chapter on noise causes and abatement procedures to make pilots sensitive to noise problems. The FAA agrees that operating procedures are an important aspect of the overall solution to the aircraft noise problem. It is also agreed that airplane flight manuals (in addition to containing noise information obtained during type certification) may be a useful means of conveying an awareness of aircraft noise problems to the owners and operators of aircraft. While the FAA encourages manufacturers to develop general information in this area, the FAA, because of the close relationship between noise operating procedures and safety, does not believe that specific procedures should be recommended and approved in an airplane flight manual.

One comment cited two reports ("Transportation Noise and Noise from Equipment Powered by Internal Combustion Engines,"

NTID 300.13, U.S. Environmental Protection Agency, December 31, 1971, and Results of Noise Survey of Seventeen General Aviation Aircraft, FAA, December, 1972) and performance data on the aircraft of two manufacturers as indicating that, for new production aircraft of current types, the proposed standard to be applied to airworthiness certification should be made effective for all types prior to January 1, 1980. While the FAA does not disagree with the general accuracy of much of the information cited by the commentator, that information does not address the potentially serious impacts on certain aircraft types, that could result if the January 1, 1980, date were accelerated.

One comment stated that the public is concerned with the noise generated by an aircraft and, from this standpoint, is not concerned with the weight of the aircraft generating the noise. This being the case, the comment asks why aircraft smaller than 12,500 pounds should be subject to noise limits lower than those that apply at the higher weight. The FAA agrees that the annoyance caused by aircraft noise is not related directly to the weight of an aircraft. However, weight is chosen as the basis for selecting the applicable noise limits because the weight of an aircraft is directly related to the engine power required by the aircraft, and, in general, the higher horsepower engines are capable of generating more noise than low horsepower engines. From the standpoint of technological practicability and economic reasonableness, it is appropriate that weight differences be reflected in the limiting noise levels.

One comment pointed out differences between the proposed FAA standards and procedures being considered for adoption by the International Standardization Organization (ISO). These comments concerned the measurement unit, the test conditions, and the number of required overflights. First, the comment recommends the addition of a duration conversion to dB(A). The addition of a duration correction adds complexity to the certification process similar to that required for other units rejected for that reason. There has been no demonstrated requirement for a measurement unit more complex than the universally accepted A-weighted decibel. The comment also noted differences between the "test window" (i.e. the limiting atmospheric conditions) proposed for ISO adoption and that proposed for adoption by the FAA. The ISO proposal is more restrictive than the FAA proposal in that it allows less variation in the atmospheric absorption coefficients. The FAA does not believe that this more restrictive test is necessary in order to obtain valid acoustical data for propeller driven small airplanes. The "test window" proposed in the Notice is believed to be adequate. The commentator stated that the ISO proposal would permit a + - 100 foot variation in test altitude but would require correction to the required 1,000-foot altitude, whereas the Notice proposed only a + - 30-foot variation and did not propose any correction procedure. The FAA believes that the smaller altitude variation can be practically complied with during the test flights and believes that correction procedures, within the permitted altitude variation, would merely add unnecessary complexity

without significantly affecting the noise levels generated by the aircraft. This aspect of the proposal is, therefore, believed to be valid. Finally, the commentator suggested that six overflights, rather than four, would be appropriate considering the confidence limits proposed in the notice. This comment has merit. Six over-flights are specified herein.

One comment pointed out a conflict between proposed Section F36.101(b) (which prohibits all testing at relative humidities higher than 90 percent), and Section F36.201(a) which implies that tests may be conducted with relative humidities higher than 90 percent, if data corrections are made. It was not intended that the effect of Section F36.101(b) be altered by the data correction procedures in Section 36.201. To eliminate this inconsistency, the words "above 90 percent" are not included in Section F36.201(a).

One comment stated that rather requiring maximum continuous power and permitting accelerated flight (for aircraft that can exceed a limiting airspeed at maximum continuous power), the regulation should require the test to be conducted at the airspeed limit but at reduced power. The FAA believes that reduced power may mask noise problems that may be evident at maximum continuous power. The use of accelerated flight does not significantly affect the accuracy of measured data. Therefore, this amendment specifies maximum continuous power and permits accelerated flight.

One comment stated that Section F36.105(e) implies the use of the "slow" dynamic characteristics of the sound level meter and that this should be expressly stated. The FAA agrees. This provision, therefore, includes the words "with dynamic characteristics designated 'slow'" after the words "A filter."

One comment questioned the need for, and the added regulatory complexity caused by, permitting aircraft of 3,300 pounds and above to generate 2 more dB(A) now than in the future. The FAA believes that the overall noise levels and timing provisions in this amendment properly reflect economic and technological factors involved in the certification of propeller driven small airplanes.

One comment noted the possibility of an abrupt change in severity as between the provisions of Appendix F for aircraft close to 12,500 pounds, and the provisions of Appendix C for turbojets and for transport category airplanes slightly heavier than 12,500 pounds. The FAA agrees that Appendix F does represent a significant advance in noise reduction over Appendix C for aircraft close to the 12,500 pound dividing line. However, this reflects the fact that Appendix C was primarily developed to respond to the technological problems associated with the abatement of turbojet noise, whereas the provisions of Appendix F deal exclusively with the inherently lower noise levels of propeller driven small airplanes.

One comment opposed the proposal that aircraft used for dispensing fire fighting or agricultural materials be required to comply with FAA approved noise abatement routes and flight plans if they cannot meet the prescribed noise limits. This comment indicated that neither agricultural nor fire fighting operations can be continued under such a restraint since both kinds of operation may require a capability of rapid response that is incompatible with a job-by-job approval of routes for noise abatement purposes. The FAA agrees with this comment and does not adopt this proposal.

One comment raised the question of whether the recording of flyover noise should be made with "A" or "linear" weighting. There is no need to specify which weighting is required since the "A" weighting required to obtain dB(A) noise value may be applied during the recording or during the analysis of the tape. The comment also asked whether a specified calibration procedure is intended. There does not appear to be a need to restrict the applicant to a particular calibration procedure, in view of the rapidly changing technology in this field. The FAA, therefore, will consider, for approval, any calibration procedure that yields accurate and reproducible results.

One comment asked whether a nondirectional microphone could be used. This amendment does not prohibit the use of such microphones.

One comment stated that the noise tests cannot be conducted at maximum weight because of the burnoff of fuel needed to conduct the tests. The FAA agrees. This amendment provides that, if the test is conducted at weights less than an airworthiness limited weight, the lower weight becomes an operating limitation. However, to reflect this comment, this amendment adds an exception where needed to account for fuel that must be used during the test itself.

One comment recommended that testing be prohibited at altitudes greater than 6,000 feet above sea level. The FAA believes that this comment may have merit for airplanes powered by supercharged engines and will monitor the administration of this amendment to those airplanes to determine if additional rulemaking is needed. For normally aspirated engines, the decrease of available power with altitude normally would, in any case, prevent the developing of maximum continuous power at high altitudes. This amendment does not contain an altitude limit as a test requirement.

One comment stated that proposed Section F36.109(g) implies that a time history record of position must be kept. Beyond requiring the applicant to demonstrate that the position of the airplane, during the actual measurement of noise, complies with the regulation, this amendment does not require the keeping of a time history of position.

One comment stated that the methods used to correct for

temperature and humidity data outside of the specified limits should either be specified in the regulations or should be methods complying with acceptable industry practices. The FAA does not believe that a particular correction method should be prescribed and will consider any method that adequately corrects the data to the acoustical standard day.

One comment stated that the formula in Section F36.201(c) should be limited to sea level standard day conditions for a normal takeoff distance. The values used in the formula (except for takeoff distance in some cases) are those developed during type certification under the airworthiness regulations. It is, therefore, not believed to be necessary to specify the conditions under which they are developed. Where takeoff distance is not developed as approved performance information, the values in Section F36.201(d) must be applied in each case, so that reference to sea level is not needed.

One comment requested that the definition of "acoustical change" in Section 21.93(b) be amended to specify that an acoustical change is one that may increase the noise levels of the airplane "in terms of FAR 36 measurement criteria." Since that paragraph begins with the words "for the purpose of complying with Part 36 of this chapter..." and in view of several years of administering Section 21.93(b) without problems concerning the definition of "acoustical change," the FAA does not believe that the suggested language is necessary.

One comment stated that the proposed amendment to Section 21.115(a) (which proposed to add a reference to the acoustical change requirements to that paragraph) is unnecessary since Section 21.115(b) already requires compliance with Section 21.33(b) which includes required noise standards. The FAA agrees in part. However, to ensure that the section heading and paragraph (a) of Section 21.115 are consistent with the other regulatory changes in this amendment, the change to that section is adopted as proposed.

One comment stated that, while noise standards are appropriate conditions of type certification, they should not be applied to the issuance of airworthiness certificates. The question of application of noise standards to type and airworthiness certificates was addressed in Notice No. 72-19. Newly Produced Airplanes of Older Type Designs, published in the Federal Register (37 F.R. 14813) on July 25, 1972. In that Notice, (which first associated noise standards with airworthiness certificates) it was stated that the proposed application of noise standards to airworthiness certificates-

> "...reflects the requirement in Section 611(a) of the Federal Aviation Act of 1958 that the Administrator shall issue noise abatement regulations 'including the application of such standards, rules, and regulations in the issuance... of any certificate authorized by this title.' Whereas the

appropriate certificate for insuring that new type designs incorporate acoustical performance features is the type certificate, and Part 36 therefore currently governs the issuance of type certificates...only, the airworthiness certificate is an appropriate title VI certificate for insuring that new production copies of previously type certificated aircraft incorporate acoustical performance design features prior to operation. This is the case because the airworthiness certificate is individually issued to each aircraft after production, and is therefore useful as a means of distinguishing (e.g. by date of issuance) those particular aircraft within a production run that require noise compliance demonstration..."

For the reasons discussed in Notice 72-19, the FAA believes that it is appropriate to apply noise standards to the issuance of airworthiness certificates to previously type-certificated aircraft where the objective is imposing noise standards on newly produced aircraft of older type designs.

One comment stated that the proposed regulation is not adequate since - (1) it does not account for the noise of aircraft operating below 1,000 feet, as during landing and takeoff, and (2) it does not involve retrofit of the current fleet of propeller driven small airplanes. By requiring maximum continuous power at the 1,000-foot altitude, the FAA believes that this amendment also addresses the noise source that is also a problem at lower altitudes, and that the added complexity of takeoff and approach noise measurements would not be justified at this time. With respect to retrofit of the current fleet, the FAA is considering the advisability of such a regulation, but does not believe that adoption of this amendment should be delayed pending the results of this review.

One comment, in addition to recommending omission of the performance correction and increasing the severity of the regulation also recommended that low speed multi-bladed propellers and chamber-type mufflers be required. The FAA believes that, rather than require specific type design details, this first issuance of a noise rule for propeller driven small airplanes should set quantitative noise limits and permit any means of compliance that also complies with the applicable airworthiness requirements.

One comment stated that there should be provision in the regulation itself for progressively reducing the maximum permitted noise level as new and more advanced technology is developed. The FAA agrees that the regulation should be reviewed and amended when justified by new technology. However, this should be accomplished, in each case, with notice and public procedure as required by the Administrative Procedure Act. Provision for the future lowering of noise limits is not, therefore, included in this amendment.

Consistent with the fact that certain propeller driven small

airplanes are not required to have an Airplane Flight Manual, but may have any combination of manuals, markings, or placards, this amendment revised the statement required by Section 36.1581 to refer to "noise levels of this airplane" rather than "noise levels in this manual."

Finally, editorial changes are made to improve the presentation of regulatory material. These include moving all of the acoustical change provisions of Part 36 to a new Section 36.7, and the restructuring of the applicability provisions of Section 36.1.

Authority: Section 313(a), 601, 603, and 611 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1431); section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)); Title I of the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.); and Executive Order 11514, March 5, 1970.

In consideration of the foregoing, Parts 21 and 36 of the Federal Aviation Regulations are amended, effective February 7, 1975.

Amendment 21-43

Form Number and Clarifying Revisions

Adopted: December 31, 1974 Effective: February 14, 1975

(Published in 40 F.R. 2576, January 14, 1975)

The purpose of these amendments is to incorporate into Parts 21, 23, and 25 of the Federal Aviation Regulations several form number and clarifying revisions.

These amendments are based on a Notice of Proposed Rule Making (Notice No. 74-33) published in the Federal Register on October 11, 1974 (39 F.R. 36495) and are the first amendments issued as a part of the First Biennial Airworthiness Review Program (ref. Notice No. 74-5, 39 F.R. 5785). These amendments and the reasons therefor are the same as those proposed in Notice No. 74-33.

Interested persons have been afforded an opportunity to participate in the making of these amendments. No objections were received.

These amendments are made under the authority of sections 313(a), 601, 603, and 608 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1428), and of section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, and for the reasons

stated in Notice No. 74-33, Parts 21, 23, and 25 of the Federal Aviation Regulations are amended effective February 14, 1975.

Amendment 21-44

Airworthiness Review Program

Amendment No. 3: Miscellaneous Amendments

Adopted: December 13, 1976 Effective: February 1, 1977

(Published in 41 FR 55454, December 20, 1976)

The purpose of these amendments is to update and improve - (1) the aircraft, engine, and propeller certification regulations; (2) the operating regulations containing airworthiness standards; and (3) related procedural requirements.

These amendments are based on a notice of proposed rule making (Notice 75-10) published in the Federal Register on March 7, 1975 (40 FR 10802) and are the third in a series of amendments to be issued as part of the First Biennial Airworthiness Review Program. The following series of amendments have previously been issued as part of this Airworthiness Review Program:

Title	Federal Register citation
Form number and clarifying revisions	(40 F.R. 2576; Jan. 14, 1975)
Rotorcraft anticollision light standards	(41 F.R. 5290; Feb. 5, 1976)

Interested persons have been afforded an opportunity to participate in the making of these amendments and due consideration has been given to all matter presented. A number of substantive changes and changes of an editorial and clarifying nature have been made to the proposed rules based upon the relevant comments received and upon further review within the

FAA. Except for the minor editorial and clarifying changes and the substantive changes discussed hereinafter, these amendments and the reasons therefore are the same as those contained in Notice 75-10.

After issuing Notice 75-10, the following six additional notices of proposed rule making were issued as part of the First Biennial Airworthiness Review Program.

Notice No.	Federal Register citation	Title
75-19	40 F.R. 21866; May 19, 1975	Notice No. 3: Powerplant Proposals.
75-20	40 F.R. 22110; May 20, 1975	Notice No. 4: Equipment Deviation List.

75-23	40 F.R. 23048; May 27, 1975	Notice No. 5: Equipment and Systems Proposals.
75-25	40 F.R. 24664; June 9, 1975	Notice No. 6: Flight Proposals.
75-26	40 F.R. 24802; June 10, 1975	Notice No. 7: Airframe Proposals.
75-31	40 F.R. 29410; July 11, 1975	Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals.

Based upon further review by the FAA, a number of proposals which were contained in Notice 75-10 are not being dealt with herein but will be considered in conjunction with other proposals contained in one of the later Airworthiness Review Program Notices of proposed rule making.

The following discussion is keyed to the like-numbered proposals contained in Notice 75-10:

Proposal 2-1. One commentator suggested that the proposed change to Section 21.33(a) be revised to limit the new aircraft engine and propeller inspection and test provisions to prototypes only. The FAA does not agree. The intent of the proposals was to make the inspection and test requirements in Section 21.33(a) compatible for aircraft, aircraft engines, and propellers. The provision applies to the item presented for type certification tests irrespective of whether or not the item is considered a prototype by the applicant for the type certificate. The proposal is therefore, adopted without substantive change.

Proposal 2-2. No unfavorable comments were received on the proposal to amend Section 23.23. Accordingly, the proposal is adopted without substantive change.

Proposal 2-3. No unfavorable comments were received on the proposal to amend Section 23.141. Accordingly, the proposal is adopted without substantive change.

Proposal 2-4. No unfavorable comments were received on the proposal to amend Section 23.143(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2-5. No unfavorable comments were received on the proposal to amend Section 23.145. Accordingly, the proposal is adopted without substantive change.

Proposal 2-6. The proposed change to Section 23.149(b) concerning the language "without exceptional piloting skill, alertness, or strength" is related to a proposed amendment to Section 23.149 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 23.149(b) contained

in Notice No. 2 is therefore being deferred until final rule making action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-6 will be considered at that time.

Proposal 2-7. Although no unfavorable comment was received on the proposal to amend Section 23.175(c), the FAA believes that clarification is necessary. The term "or thrust" has been added to the end of the language "maximum cruising power" in proposed Section 23.175(c)(3). Proposed Section 23.175(c)(4) was intended to clarify the requirement concerning trim speed, but the FAA believes the conflict in language with a similar provision in Section 23.175(b)(2)(iii) may cause confusion. Therefore, proposed Section 23.175(c)(4) is withdrawn.

Proposal 2-8. The proposed change to Section 23.253(b) is related to a proposed amendment to Section 23.253(b)(3) that is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75-31; 40 FR 29410, July 11, 1975). The proposed amendment to Section 23.253(b) contained in Notice No. 2 is therefore being deferred until final rule making action is taken with respect to the related proposal in Notice 75-31. Comments submitted for Proposal 2-8 will be considered at that time.

Proposal 2-9. No unfavorable comments were received on the proposal to amend Section 23.397. Accordingly, the proposal is adopted without substantive change.

Proposal 2-10. No unfavorable comments were received on the proposal to add a new Section 23.479(d). Accordingly, the proposal is adopted without substantive change.

Proposal 2-11. One commentator objected to the proposed use of the language "materials used for parts, the failure of which could adversely affect safety" in place of the language "materials used in the structure" in Sections 23.603(a) and 25.603. The FAA does not agree with the commentator's suggestion that all parts of the airplane should, unless specifically excluded, be considered structure. The FAA believes that consideration of the suitability and durability of materials used should be broadened to include parts not normally considered airplane structure.

Proposal 2-12. No unfavorable comments were received on the proposal to amend Section 23.607. Accordingly, the proposal is adopted without substantive change.

Proposal 2-13. A commentator questioned whether proposed Section 23.675 would require that stops provided to limit the range of motion of an aerodynamic surface be located only on the aerodynamic surface or whether the stop could be located adjacent to the surface. Section 23.675, as proposed and as adopted herein, without change, requires that stops positively limit the

range of motion of moveable aerodynamic surfaces. This can be accomplished by locating the stop on structure adjacent to the surface.

Proposal 2-14. No unfavorable comments were received on the proposal to amend Section 23.685(a). Accordingly, the proposal is adopted without substantive change. See proposal 2-109.

Proposal 2-15. No unfavorable comments were received on the proposal to add a new Section 23.733(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-16. No unfavorable comments were received on the proposed new Section 23.787(f). However, one commentator pointed out that the word "contract" in the proposal as printed in the Federal Register should be "contact." The proposal has been corrected to eliminate the printing error. The proposal has also been clarified based on a comment received on Proposal 2-111, to avoid any implication that lamps will be required in cargo compartments.

Proposal 2-17. On commentator questioned the need in proposed Section 23.841(b)(6) for a warning indicator at the pilot station to indicate when a cabin pressure altitude of 10,000 feet is exceeded. But as noted by the commentator it is a general industry practice to provide this warning at a cabin altitude of 10,000 feet. The FAA believes that due to the larger number of small airplanes having such a warning many pilots may come to rely on the warning at this cabin altitude. The proposal is therefore adopted without substantive change.

Proposal 2-18. The proposed changes to Sections 23.853, 27.853, and 29.853 concerning the certification requirements necessary to permit smoking in certain aircraft categories are related to proposed standards for Section 25.853. The amendments proposed for Section 25.853 are contained in Airworthiness Review Program Notice No. 2: Miscellaneous Proposals (Notice 75-10; 40 FR 10802; March 7, 1975) and in Airworthiness Review Program Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75-31; 40 FR 29410; July 11, 1975). The proposals for Section 25.853 in Notice 75-10 is being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-31. The proposed amendments to Sections 23.853, 27.853 and 29.853 contained in Notice 75-10 are therefore being deferred until final rulemaking action is taken with respect to the related proposal for Section 25.853. Comments submitted for Proposals 2-18, 2-114, and 2-160 will be considered at that time.

Proposal 2-19. One commentator suggested a clarification of proposed new Section 23.903(b) noting that the language, "must be designed to give reasonable assurance" would be subject to divergent application. The same language is now used in Section 25.903(d)(2), and the FAA believes that experience with this provision in transport category type certification has been

satisfactory.

One commentator suggested that a provision similar to Section 25.903(d)(1) concerning design precautions to minimize hazards to the airplane in the event of an engine rotor failure be included in proposed Sections 23.903(b), 27.903(c), and 29.903(f). Although several airworthiness directives have been issued to prevent the failure of engine rotors in one engine type, the FAA does not believe that a general requirement for Sections 23.903(b), 27.903(c), or 29.903(f) that is identical to Section 25.903(d)(1) is necessary at this time.

Proposal 2-20. No unfavorable comments were received on the proposal to amend Section 23.933(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2-21. One commentator objected to proposed new Section 23.941 concerning airplanes with variable inlet or exhaust system geometry as being unnecessary and unjustified in Part 23. The FAA agrees that this provision should not be added to Part 23 at this time and is therefore withdrawing the proposal.

Proposal 2-22. One commentator suggested that the proposed changes to Sections 23.971 and 23.999 be revised to require a quick actuation drain valve on each fuel tank. The proposal, however, was not to require new drainage outlets but to establish standards for the drains set forth in proposed Section 23.971(b) and present Section 23.999(a). The FAA does not have sufficient information to indicate that a need exists for a quick actuation drain valve on each fuel tank considering the large number of different types of fuel tanks which are included on Part 23 airplanes and the use of sediment bowls and chambers. The proposal is therefore adopted without substantive change.

Proposal 2-23. One commentator question the proposed requirement in Section 23.977(a)(2) that a turbine engine fuel strainer prevent the passage of any object that could restrict fuel flow or damage any fuel system component. The commentator asserted that a strainer which met this requirement would have an opening so small that ice accumulation with the use of turbine fuels would be a problem. The FAA does not agree. This is identical to the provision in Section 25.977(a)(2). Experience with fuel strainers that would meet the proposed standards in Section 23.977(a)(2) has shown that a strainer can prevent the passage of the noted objects and also prevent ice accumulation.

One commentator noted that the clear area of each fuel tank outlet strainer should be at least six times the area of the outlet line instead of five times as proposed in Section 23.977(b). This provision is identical to Section 25.977(c) and the FAA considers that experience with this requirement in Part 25 has been satisfactory.

Proposal 2-24. The intent of the proposal to add a new

Section 23.979(e) was to provide strength requirements including load factors, applicable to the airplane defueling system to cover surge pressure during defueling. Upon further review the FAA believes that the proposed amendment is premature. Therefore, the proposal is withdrawn.

Proposal 2-25. No unfavorable comments were received on the proposal to amend Section 23.995(d). Accordingly, the proposal is adopted without substantive change.

Proposal 2-26. One commentator suggested that there should be sufficient clearance between the quick actuation drain and other parts of the airplane to allow the fuel sample to be drained into a typical, small container. The FAA believes fuel system drains which meet the proposed requirements of paragraphs (b)(1) and (b)(3) of Section 23.999, that the drain discharge clear of all parts of the airplane and that it be readily accessible, will have sufficient clearance to allow a fuel sample to be drained into a small container.

One commentator suggested that the requirement in Section 23.999(b)(1) that the drain must discharge clear of all parts of the airplane, would create unnecessary design and construction restraints. The FAA believes that by coating some airplane surfaces with fuel or by trapping quantities of fuel in certain locations a fire hazard exists. This fire hazard should be limited by this proposal. Further, the FAA believes this requirement can be met without an undue restraint on airplane design.

A commentator asserted that the proposed requirement in Section 23.999(b)(3), that the drain valve be either located or protected so that it will not be damaged in the event of a landing with landing gear retracted cannot be justified. The commentator noted that the fuel tanks would be ruptured in such a landing and nothing would be gained if the drain was protected. The FAA disagrees, similar fuel tank installation requirements are set forth in Section 23.967 and experience indicates that the fuel system can and should be either located or protected to prevent fuel leakage in such a landing. The FAA does agree that the proposal needs to be clarified to more specifically provide a design specification and has, so modified paragraph (b)(3). Also see Proposal 2-70.

Proposal 2-27. No unfavorable comments were received on the proposal to add a new Section 23.1093(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-28. Proposed Section 23.1111(c) was misunderstood by one commentator who asserted that it is not possible to assure the impossibility of failure of the engine lubricating system. The proposal, however, was directed toward the elimination of hazardous contamination of the cabin air assuming a failure of the engine lubricating system. In consideration of the misunderstanding, the language has been

revised to emphasize the prevention of hazardous contamination of cabin air system.

Proposal 2-29. Although no unfavorable comment was received on the proposed Section 23.1125, the FAA believes that the proposal could be misunderstood as to whether use of the heat exchanger would permit or prohibit the passage of exhaust gases through the exchanger when hot air was not being directed to the area where it was intended to be used. The FAA's intention was to require cooling of the exchanger wherever it was in contact with exhaust gases, regardless of its usage status. The proposal is revised to make this clear using the language of Sections 25.1125(a)(3) and 29.1125(a)(3). The FAA believes that the exhaust heat exchange requirements should be paralleled in Parts 23, 25 and 29. Therefore the proposed changes to Sections 25.1125(a)(3) and 29.1125(a)(3) are withdrawn.

Proposal 2-30. No unfavorable comments were received on the proposal to amend Section 23.1143. Accordingly, the proposal is adopted without substantive change.

Proposal 2-31. One commentator believed that proposed Section 23.1165(e) was unnecessarily restrictive in requiring all ignition systems to be independent of all other electrical systems. The FAA agrees with respect to reciprocating engines since Section 33.37 requires a dual ignition system or an ignition system of equivalent inflight reliability for reciprocating engines and Section 23.903 requires each engine installed on small airplanes to be type certificated under Part 33. However, the FAA disagrees with respect to turbine engines since two separate primary electrical circuits are not required in Section 33.69. The rule as adopted is applicable to turbine engines installed on small airplanes only.

Proposal 2-32. One commentator objected to the proposal to add a speed warning device for turbopropeller powered airplanes. The FAA believes that due to the characteristics of turbopropeller powered airplanes that make it desirable to operate at the maximum operating limit speed (V sub MO/M sub MO), and the increasing preoccupation of pilots with air traffic and other duties which distract them from continuous monitoring of airspeed instruments overspeed conditions can be a problem. Therefore, to insure early warning and thus to make a major portion of the speed margin available for pilot reaction and recovery maneuvers, the amendment requires that the speed warning device must give effective aural warning (differing distinctively from aural warnings used for other purposes) to the pilots whenever the speed exceeds V sub MO plus 6 knots or M sub MO + 0.01.

It should also be noted that the proposal for Section 23.1303(d) has been revised to make it like Section 25.1303(a)(1) to allow for an air temperature indicator which provides indications that are convertible to free-air temperature.

Proposal 2-33. No unfavorable comments were received on the proposal to amend Section 23.1309. Accordingly, the proposal is adopted without substantive change.

Proposal 2-34. One commentator suggested that proposed Sections 23.1322 and 25.1322 concerning warning, caution, and advisory light be revised. The commentator noted that requiring a blue light for position indication was not always appropriate since blue was difficult to see in direct sunlight but was readily distinguishable in heavily shaded installations. The FAA agrees that blue should not be an established standard applicable to all installations. Therefore proposed Sections 23.1322(d), 25.1322(d), 27.1322(d) and 29.1322(d), concerning blue lights, are withdrawn. Also see Proposal 2-82.

Proposal 2-35. The proposed amendments to Sections 23.1325, 25.1325, and 29.1325 concerning the static pressure sources are related to proposed amendments to Section 27.1325 that are contained in Airworthiness Review Program, Notice No. 2: Miscellaneous Proposals (Notice 75-10; 40 FR 10812; March 7, 1975) and in Airworthiness Review Program, Notice No. 5: Equipment and System Proposals (Notice 75-23; 40 FR 23048; May 27, 1975). The proposed amendment to Section 27.1325 in Notice 75-10 is being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-23. The proposed amendments to Sections 23.1325, 25.1325, and 29.1325 contained in Notice 75-10 are therefore being deferred until final rulemaking action is taken with respect to the related proposed amendments to Section 27.1325. Comments submitted for Proposals 2-35, 2-83, and 2-183 will be considered at that time.

Proposal 2-36. One commentator questioned the proposed lead-in for Section 23.1331(b). The commentator interpreted the proposal to mean that each instrument must have independent power sources and noted that the explanation did not indicate this to be intended. The FAA agrees that the proposal is not clear, and the proposal is withdrawn.

Proposal 2-37. The proposed change to Section 23.1335 concerning the deletion of the section is related to a proposed amendment to Section 23.1335 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems Proposals (Notice 75-23; 40 FR 23048; May 27, 1975). The proposed amendment to Section 23.1335 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-23. Comments submitted for Proposal 2-37 will be considered at that time.

Proposal 2-38. No unfavorable comments were received on the proposal to amend Section 23.1351. Accordingly, the proposal is adopted without substantive change.

Proposal 2-39. Proposed Section 23.1353(f) concerning nickel-cadmium batteries is related to a proposed amendment to Section 23.1581 that is contained in Airworthiness Review

Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 23.1353 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-39 will be considered at that time.

Proposal 2-40. For comments related to the proposed amendment of Section 23.1385, see Proposal 2-89.

Proposal 2-41. One commentator suggested that proposed Section 23.1411(b)(2) be revised to conform to the language in Section 25.1411(b)(2). The FAA, however, believes a more specific standard is appropriate for Sections 23.1411 and 27.1411. Therefore, the proposed amendments to Sections 23.1411 and 27.1411 are adopted without substantive change.

Proposal 2-42. One commentator suggested that the proposed change to Section 23.1549 be revised to accommodate horizontal scale powerplant instruments. The FAA agrees, and Sections 23.1549, 27.1549 and 29.1549, as adopted, will provide marking standards appropriate to circular, horizontal and vertical scale powerplant instruments.

Proposal 2-43. The proposed change to Section 23.1555 concerning the information requirements of usable fuel in a restricted use fuel tank is related to a proposed amendment to Section 23.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 23.1555 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-43 will be considered at that time.

Proposal 2-44. The proposed change to Section 23.1557 concerning the system voltage marking requirement adjacent to its external power connection is related to a proposed amendment to Section 23.1557 that is contained in Airworthiness Review Program, Notice No. 3; Powerplant Proposals (Notice 75-19; 40 FR 21866; May 19, 1975). The proposed amendment to Section 23.1557 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-19. Comments submitted for Proposal 2-44 will be considered at that time.

Proposal 2-45. The proposed change to Section 23.1581 concerning the Airplane Flight Manual is related to a proposed amendment to Section 23.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 23.1581 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related Proposal in Notice 75-25. Comments submitted for Proposal 2-45 will be considered at that time.

Proposal 2-46. The proposed change to Section 23.1587(a)(2) is related to proposed amendments to Section 23.1587 that were contained in Airworthiness Review Program, Notice 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 23.1587 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-46 will be considered at that time.

Proposal 2-47. One commentator suggested that considering the proposed deletion of Sections 25.45 through 25.75, current Section 25.161(e) will need to be amended to replace the reference to Section 25.69. The FAA agrees, and Section 25.161(e)(1) is amended by striking the reference to Section 25.69 and inserting in place thereof a reference to Section 25.123(a). In addition, the FAA has found that Section 25.201(c)(1) refers to Section 25.49(c)(2)(i) that would also be deleted. Therefore, Section 25.201(c)(1) as amended strikes the phrase "Section 25.49(c)(2)(i) for reciprocating engine powered airplanes, or in" and the phrase "for turbine engine powered airplanes".

Proposal 2-48. No unfavorable comments were received on the proposed change to strike the words "turbine powered" from Section 25.101(a). Accordingly, proposed Section 25.101(a) is adopted without substantive change.

No unfavorable comments were received on proposed Section 25.101(b) and it is adopted as proposed except that it is clarified to indicate that the 80% relative humidity for reciprocating engines is based on standard atmospheric temperature (the vapor pressure values in the table in proposed Section 25.101(b)(2) correspond to 80% relative humidity with a standard atmosphere).

Proposal 2-49. Based on comments received on the proposal to amend Section 25.105 and on the related proposals to Sections 25.125, 25.241 and 25.1533(c), and upon further review by the FAA, Proposals 2-49, 2-51, 2-52 and the portion of 2-93 dealing with the new operating limitation requirements for transport category airplanes intended to be used in operations on unpaved runways are withdrawn.

Proposal 2-50. No unfavorable comments were received on the proposal to amend Section 25.107. Accordingly, the proposal is adopted without substantive change.

Proposal 2-51. For comments related to the withdrawal of the proposed amendment of Section 25.125, see Proposal 2-49.

Proposal 2-52. For comments related to the withdrawal of the proposal to add a new Section 25.241, see Proposal 2-49.

Proposal 2-53. No unfavorable comments were received on the proposal to amend Section 25.397. Accordingly, the proposal is adopted without substantive change.

Proposal 2-54. For comments related to the proposed amendment of the lead-in of Section 25.603, see Proposal 2-11.

Proposal 2-55. No unfavorable comments were received on the proposal to amend Section 25.675. Accordingly, the proposal is adopted without substantive change. Also see Proposal 2-13.

Proposal 2-56. No unfavorable comments were received on the proposal to amend Section 25.685(a). Accordingly, the proposal is adopted without substantive change. See Proposal 2-109.

Proposal 2-57. No unfavorable comments were received on the proposal to add a new Section 25.733(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-58. One commentator questioned whether the proposed Section 25.775(e) would require that there be at least two windshield panels in the windshield for each pilot. The intent of the proposal, however, is to provide at least one windshield panel through which is at least one pilot could see if vision was lost through another panel.

Proposal 2-59. Proposed Section 25.783(g) concerning integral stairs installed in passenger entry doors that qualify as passenger exits is related to a proposed amendment to Section 25.783 that is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75-31; 40 FR 29410; July 11, 1975). The proposed amendment to Section 25.783(g) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-31. Comments submitted for Proposal 2-59 will be considered at that time.

Proposal 2-60. The proposed change to Section 25.785 is related to a proposed amendment to Section 25.785 that is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75-31; 40 FR 29410; July 11, 1975). The proposed amendment to Section 25.785 contained in Notice No. 2 is, therefore, being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-31. Comments submitted for Proposal 2-60 will be considered at that time.

Proposal 2-61. No unfavorable comments were received on the proposed new Section 25.787(c). However, based on a comment received on Proposal 2-111, this proposal has been revised to avoid any implication that lamps will be required in cargo compartments.

Proposal 2-62. Four of the five comments received were in favor of the proposal for Section 25.815 that would provide for the approval of an aisle width of less than 12 inches, but not less than 9 inches, in transport airplanes with a passenger seating capacity of 10 or less if the aisle width is substantiated by necessary tests. One commentator requested that the proposal be withdrawn because it would result in a reduction in the margin of passenger safety. The FAA disagrees. Service experience with aircraft certificated with less than a 12 inch aisle width in the past has been satisfactory.

Moreover, the FAA will not certificate transport category aircraft with less than a 12 inch aisle width unless the Administrator finds by necessary test that the narrower aisle is safe.

The proposal is adopted without change.

Proposal 2-63. The proposed change to Section 25.831 concerning the temperature and ventilation controls for the crew compartment is related to a proposed amendment to Section 25.831 that is contained in Airworthiness Review Program Notice No. 5: Equipment and Systems Proposals (Notice 75-23; 40 FR 23048, May 27, 1975). The proposed amendment to Section 25.831 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-23. Comments submitted for Proposal 2-63 will be considered at that time.

Proposal 2-64. One commentator recommended that proposed Section 25.841(b)(1) be revised to make it clear that the pressure relief function may be combined with the regulating valve. The proposal would delete the requirement that one of the pressure relief valves be a pressure regulating valve, but it would still allow such a design. This was specifically covered in Notice 75-10.

One commentator suggested that the language "passenger or crew compartment" in proposed Section 25.841(b)(8) be changed to read "occupiable area in the cabin" to ensure that a pressure sensor is located in the lower deck service compartment. The FAA believes the language "occupiable area in the cabin" does not clarify the proposed requirements. The language "passenger and crew compartment" is not limited to the main deck of the airplane, but includes a lower deck service compartment even though this lower deck service compartment may not be occupied during takeoff and landing. For clarification, the parenthetical "(including upper and lower lobe galleys)" has been added to Section 25.841(b)(8) as adopted.

Proposal 2-65. The proposed change to Section 25.853 concerning the certification requirements necessary to permit smoking in transport category airplanes is related to a proposed amendment to Section 25.853 that is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine and Propeller

Airworthiness, and Procedural Proposals (Notice 75-31, 40 FR 29410; July 11, 1975). The proposed amendment to Section 25.853 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-31. Comments submitted for Proposal 2-65 will be considered at that time.

Proposal 2-66. No unfavorable comments were received on the proposal to amend Section 25.933(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2-67. A commentator suggested that a cross-reference to Section 25.143 should be added to proposed Section 25.941. The FAA agrees that the pilot strength limits now set forth in Section 25.143 should be referenced in Section 25.941 in order to define appropriately what constitutes "exceptional strength on the part of the pilot". Accordingly, a paragraph (c) has been added to proposed Section 25.941 for that purpose.

Proposal 2-68. Two commentators agreed with the intent of the proposed Section 25.951(a) concerning fuel system design and operation of the auxiliary power unit (APU) but requested that it be withdrawn to allow time to review other Part 25 provisions for applicability to APU installations. The FAA does not believe that a further review of Part 25 should in this case, delay completion of this rulemaking action. However, if the FAA determines that the language "auxiliary power unit" should be specifically set forth in other provisions to avoid misinterpretation, the FAA will take action to clarify these provisions.

One commentator stated that the fuel system for an APU operated on the ground would be unnecessarily subject to the same requirement as the engine fuel system. The FAA does not agree that this is necessary. If certain operating conditions are the same for both the engine fuel system and the APU fuel system, the FAA believes that the requirements during such periods should be the same. The proposal is therefore adopted without substantive change.

Proposal 2-69. One commentator suggested that the language "proof and ultimate factors" in the proposal for new paragraphs (d) and (e) of Section 25.979 be revised to be consistent with Section 25.301. The FAA agrees that the terminology should be consistent and the section as adopted is reworded to use the term ultimate load.

One commentator questioned whether the design criteria for the pressure fueling system was applicable to fuel tank vents. The proposed amendment to Section 25.979 was not intended to apply to fuel tanks and vents. The section as adopted has been revised to make this clear.

Proposal 2-70. Several commentators questioned the meaning of the term "quick actuation drain valve" in proposed Section

25.999(b)(3). The FAA agrees that the term may be subject to misinterpretation and that the provision is complete without the words "quick actuation".

One commentator asserted that the proposed requirement in Section 25.999(b)(3) that the drain valve not be damaged in the event of a landing with landing gear retracted was not a proper design specification since damage was beyond the control of the manufacturer. The FAA agrees that the language "so that it will not be damaged" is not proper for this requirement, but the FAA believes that the valve, the location of the valve, or both, can be designed to prevent fuel spillage, assuming that a landing is made with the landing gear retracted. The section as adopted has been revised to clarify this intent.

Proposal 2-71. One commentator suggested that proposed Section 25.1027(d) be revised to limit the design consideration to sludge or other foreign matter entering the feathering system from the oil tank. The FAA disagrees. Design consideration and flexibility should not be limited to preventing entry of material into the feathering system. All sources of sludge and foreign matter must be considered since the purpose of the regulation is the safe operation of the propeller feathering system. The proposal, therefore is adopted without substantive change.

Proposal 2-72. One commentator suggested that the word "critical" be added before the language "ground, water, and flight operating conditions" in the proposal for Section 25.1041, but no reason was given. As noted in the explanation to this proposal, Section 25.1041 contains a general cooling requirement, while Sections 25.1043 and 25.1045 are more specific with respect to the type of operating conditions which must be considered during tests. Critical conditions are included in the test requirements of Sections 25.1043 and 25.1045. However, the FAA believes that cooling provisions must be adequate under all ground, water, and flight operating conditions.

Proposal 2-73. No unfavorable comments were received on the proposal to amend Section 25.1091(c)(2). Accordingly, the proposal is adopted without substantive change.

Proposal 2-74. One commentator agreed with the proposal for Section 25.1093 but suggested that the proposal be changed to agree with the format of the previous paragraphs. The FAA agrees, and the proposal as adopted has been structured the same as the previous paragraphs.

Proposal 2-75. One commentator objected to the proposed lead-in for Section 25.1125 that limited the applicability of the section to reciprocating engines. The FAA does not believe that the requirements of this section are applicable to other than reciprocating engine powered airplanes. While some early turbine powered airplanes have had an ejector installation in the exhaust stream to pull cooling air through the nacelle, the FAA does not consider this to be an exhaust heat exchanger within the meaning

of the language of Section 25.1125. Therefore, the proposed lead-in for Section 25.1125 is adopted without substantive change.

Proposed Section 25.1125(a)(3) is withdrawn. For a discussion of the withdrawal, see Proposal 2-29.

Proposal 2-76. A commentator stated that the phrase "automatically controlled with relation to the amount of power produced by the engine" in proposed Section 25.1143(d) is not appropriate for all fluid injection systems. The FAA agrees that the phrase is not appropriate for certain turbine engine powered airplanes and that further revision of Section 25.1143(d) should be considered. Proposed Section 25.1143(d) has therefore been withdrawn for further study.

No unfavorable comment was received concerning proposed Section 25.1143(e) and this paragraph has been adopted without substantive change.

Proposal 2-77. No unfavorable comments were received on the proposal to add a new Section 25.1167. Accordingly, the proposal is adopted without substantive change.

Proposal 2-78. No unfavorable comments were received on the proposal to amend Section 25.1197(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-79. One commentator suggested that proposed Section 25.1303(a)(2) be revised to clarify the method of clock indication which would be permitted under the regulation. The FAA agrees that the intent of the proposal was only to recognize the development of accurate digital clocks and that the minimum information presented should be the same. Proposed Sections 25.1303(a)(2) and 29.1303(d) as adopted are revised to make this clear.

Proposal 2-80. Several commentators suggested that the proposed change to Section 25.1305 be revised to except anti-detonant injection (ADI) systems from the powerplant instrument proposal for fluid augmentation systems. The commentator expressed the opinion that the proposal for Section 25.1143(d) concerning automatic controls for fluid injection systems (other than fuel) eliminated the need for a powerplant instrument for the ADI system. The FAA believes that the flight crew should be able to monitor the proper functioning of any fluid system that is used for thrust or power augmentation and the section as adopted is applicable to ADI systems. However, the section has been clarified to ensure application only to fluids systems that are used for thrust or power augmentation.

Proposal 2-81. No unfavorable comments were received on the proposal to amend Section 25.1309. Accordingly, the proposal is adopted without substantive change.

Proposal 2-82. One commentator questioned the proposed color standardization of warning, caution, and advisory lights in new Section 25.1322. The commentator stated "arbitrary standards for specific light colors cannot always be stated" because of the design objective to minimize red lights that require immediate crew action and of the need to consider past experience, test, crew acceptance, and the specific application. The FAA agrees that considerations other than the need for standardization of light colors may dominate in special circumstances, and the section as adopted provides for approval by the Administrator of light colors that are different than the standard. As stated by the commentator and in the section as adopted, a design objective is to have red warning lights only if a hazard is to be indicated which may require immediate corrective action.

One commentator noted that the language "warning light" is used in other sections of the regulations, such as Section 25.812(e)(2), and a hazard which may require immediate corrective action will not be indicated. The FAA does not agree; the light noted in Section 25.812(e)(2) should be red in future designs unless otherwise approved by the Administrator. The FAA believes that in other sections, if the language "warning light" is used, it is consistent with proposed new Section 25.1322. However, if the language "warning light" is determined to be not generally applicable, later rulemaking action can be instituted.

One commentator suggested a clarification of the lead-in of the proposal to limit its applicability to lights installed in the cockpit as indicated in the explanation to the proposal. The FAA agrees, and the lead-ins of Sections 23.1322, 25.1322, 27.1322, and 29.1322 have been clarified.

Also see Proposal 2-34 for a discussion of the withdrawal of the blue light proposal.

Proposal 2-83. For comments related to the deferral of proposed Section 25.1325(g), see Proposal 2-35.

Proposal 2-84. The proposed change to Section 25.1329 concerning the redesignation of Section 25.1329 as Section 25.1311 and the addition of provisions for automatic flight control systems is related to a proposed amendment to Section 25.1329 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems Proposals (Notice 75-23; 40 FR 23048, May 27, 1975). The proposed amendment to Section 25.1329 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-23. Comments submitted for Proposal 2-84 will be considered at that time.

Proposal 2-85. Proposed Section 25.1331(a)(2) concerning instruments using a power supply is related to proposed amendments to Sections 25.1331 and 25.1333 that are contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems Proposals (Notice 75-23; 40 FR 23048; May 27, 1975). The

proposed amendment to Section 25.1331(a)(2) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposals in Notice 75-23. Comments submitted for Proposal 2-85 will be considered at that time.

Proposal 2-86. Proposed Section 25.1337(a) concerning auxiliary power unit instrument lines is related to a proposed amendment to Section 25.1337(a) that is contained in Airworthiness Review Program, Notice No. 3: Powerplant Proposals (Notice 75-19; 40 FR 21866; May 19, 1975). The proposed amendment to Section 25.1337(a) contained in Notice No. 2 is therefore deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-19. Comments submitted for Proposal 2-86 will be considered at that time.

Proposal 2-87. Proposed Section 25.1353(c)(5) is related to a proposed amendment to Section 25.1585 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 25.1353(c)(5) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-87 will be considered at that time.

Proposal 2-88. No unfavorable comments were received on the proposal to amend Section 25.1355(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-89. Several commentators suggested that the list of factors to consider for locating forward and rear position lights in proposed Sections 23.1385, 25.1385, 27.1385, and 29.1385 was incomplete.

Two commentators, also suggested that proposed Sections 23.1385(c) and 25.1385(c) be revised to permit a new position light be installed on each wing tip. The FAA agrees that further study is necessary to develop factors of general applicability for position lights on all aircraft but that a rear position light as far aft as practical on each wing tip of an airplane is a reasonable alternative location. Accordingly, proposed Sections 23.1385(c) and 25.1385(c) have been revised. The proposals concerning the list of factors to be considered for locating forward and rear position lights in Section 25.1385 and paralleled in proposed Sections 23.1385, 27.1385, and 29.1385 are withdrawn. However, the deletion of the passing light requirement from current Section 25.1385(e) will be made.

Proposal 2-90. One commentator asserted that proposed new Section 25.1403 was an operating requirement, not an airworthiness requirement and therefore was not appropriate for Part 25. Although a similar requirement currently exists in Section 121.341(b), the FAA believes that such a requirement should be applicable to all newly certificated transport category airplanes.

Two commentators pointed out that the proposal differs from 121.341(b) in that the proposal was not limited to the area of the wings that are critical from the standpoint of ice accumulation. The FAA agrees, and the section as adopted has been revised accordingly.

A comment was also received that expressed the belief that under the proposal, illumination or other means of ice detection would not be necessary if the wing was shown to have acceptable ice accumulation characteristics. The FAA does not agree. Unless an operating limitation prohibits operations at night in known or forecast icing conditions, the means set forth are required.

Proposal 2-91. Several commentators said that the proposed change to Section 25.1439(b)(2)(ii) concerning standards for masks and eye coverings was premature in view of the current testing being conducted on this type of equipment by the FAA. The FAA agrees that this proposed amendment is premature, and new standards are being considered for a later rulemaking action. The proposed change to Section 25.1439(b)(2)(ii) is therefore withdrawn.

No favorable comments were received on the proposal to amend paragraph (a) of Section 25.1439. Accordingly, the proposal is adopted without substantive change.

Proposal 2-92. No unfavorable comments were received on the proposal to amend Section 25.1515. Accordingly, the proposal is adopted without substantive change.

Proposal 2-93. No unfavorable comments were received on the proposal to amend the heading of Section 25.1533 and on the proposal to amend Section 25.1533(a). Accordingly, this amendment is adopted without substantive change. For comments related to the withdrawal of the proposed new Section 25.1533(c), see Proposal 2-49.

Proposal 2-94. The proposed change to Section 25.1549 concerning the marking requirements for powerplant instruments is related to a proposed amendment to Section 25.1549 that is contained in Airworthiness Review Program, Notice No. 3: Powerplant Proposals (Notice 75-19; 40 FR 21866; May 19, 1975). The proposed amendment to Section 25.1549 contained in Notice No. 2 is therefore deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-19. Comments submitted for Proposal 2-94 will be considered at that time.

Proposal 2-95. One commentator took exception to the proposed deletion of the requirement for marking fuel and oil tank capacities at the filler openings in Section 25.1557(b). The FAA believes this method of providing the usable fuel tank capacity and the oil tank capacity is no longer necessary. The pilot has the fuel quantity gage and the Airplane Flight Manual,

and the servicing personnel usually have no interest in the usable fuel tank capacity. The determination of oil level in oil tanks is usually accomplished with the dipstick. Accordingly, the proposal is adopted without substantive change.

Proposal 2-96. The proposed change to Section 25.1581 concerning the Airplane Flight Manual is related to proposed amendment Section 25.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 25.1581 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-96 will be considered at that time.

Proposal 2-97. No unfavorable comments were received on the proposal to amend Section 25.1583. Accordingly, the proposal is adopted without substantive change.

Proposal 2-98. The proposed change to Section 25.1587 concerning performance information is related to a proposed amendment to Section 25.1587 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 25.1587 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-98 will be considered at that time.

Proposal 2-99. Two commentators questioned the applicability of proposed Section 27.25(c) concerning a total weight that was greater than the maximum weight established under Section 27.25(a) and noted that a clarification of the applicable flight requirements was needed. The FAA agrees that proposed Section 27.25(c) should be clarified. Proposed Sections 27.25(c) and 29.25(c) are intended to provided to provide only a total weight standard for approving the rotorcraft structure for rotorcraft that will be operated under Part 133. Proposed Sections 27.25(c) and 29.25(c) as adopted have been revised to clarify this intent.

Proposal 2-100. Proposed Section 27.65(a)(2)(i) concerning climb gradients for rotorcraft other than helicopters is related to a proposed new Section 27.1587(b)(3) that is contained in Airworthiness Review Program, Notice No. 2: Miscellaneous Proposals (Notice 75-10; 40 FR 10802; March 7, 1975). The proposed amendment to Section 27.1587 contained in Notice 75-10 is being deferred; see Proposal 2-140. Therefore, the proposed amendment to Section 27.65 contained in Notice 75-10 is also deferred until final rulemaking action is taken with respect to the related proposal for Section 27.1587. Comments submitted for Proposal 2-100 will be considered at that time.

Proposal 2-101. No unfavorable comments were received on the proposal to amend Section 27.141. Accordingly, the proposal

is adopted without substantive change.

Proposal 2-102. No unfavorable comments were received on the proposal to amend Section 27.173(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-103. No unfavorable comments were received on the proposal to amend Section 27.175(d)(2)(iv). Accordingly, the proposal is adopted without substantive change.

Proposal 2-104. No unfavorable comments were received on the proposal to amend Section 27.312(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-105. No unfavorable comments were received on the proposal to amend Section 27.339. Accordingly, the proposal is adopted without substantive change.

Proposal 2-106. Two commentators suggested that the limit pilot torque for rotorcraft twist controls in proposed Sections 27.397(b)(2) and 29.397(b)(2) should be 80 times the radius (R) in inches instead of 133 inch-pounds, as proposed. The FAA agrees that the pilot torque load requirements should be a function of the radius (R). Also the FAA does not expect the radius (R) of any twist control installed on any rotorcraft type certificated in the future to be greater than 133/80 inches. Therefore, the proposals as adopted revise the limit pilot torque load to 80R inch-pounds.

Proposal 2-107. No unfavorable comments were received on the proposal to add a new Section 27.563. Accordingly, the proposal is adopted without substantive change.

Proposal 2-108. No unfavorable comments were received on the proposal to amend Section 27.603. Accordingly, the proposal is adopted without substantive change.

Proposal 2-109. One commentator disagreed with proposed Sections 27.685(a) and 29.685(a) that would require the consideration of the effects of the freezing of moisture on control systems since Sections 27.685(a) and 29.685(a) currently require that control systems be designed to prevent jamming. While the explanation for this proposal indicated that the freezing of moisture was a common cause of control jamming, the proposal is also directed at preventing chafing and interference caused by the freezing of moisture. Accordingly, the proposals are adopted without substantive change.

Proposal 2-110. No unfavorable comments were received on the proposal to add a new Section 27.733(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-111. Based on a comment received, the proposed change to Section 27.787 has been revised to avoid any implication that lamps will be required in cargo compartments.

Proposal 2-112. No unfavorable comments were received on the proposal to add a new Section 27.801. Accordingly, the proposal is adopted without substantive change.

Proposal 2-113. Several commentators stated that the ditching emergency exit standards proposed for Sections 27.807(d) and 29.807 should not be applicable to all rotorcraft. The commentators noted that the new standards would unnecessarily penalize rotorcraft that would never be involved in a ditching situation. The FAA agrees that certain rotorcraft may not operate in areas where ditching is a concern. Compliance with the ditching emergency exit standards should not be required for all rotorcraft during type certification. Therefore, the proposals as adopted have been revised to make it applicable only to rotorcraft for which ditching certification is requested. The overhead hatch requirements proposed in new Sections 27.807(d)(2) and 29.807(d)(3) are withdrawn because of the possible hazards associated with a turning main rotor. In addition, the reference in proposed Section 27.807(d) to Section 27.807(a) has been deleted as unnecessary, and the reference in proposed Section 29.807(d) to Section 29.807(c) has been deleted as inappropriate.

Proposal 2-114. For comments related to the proposed amendment of Section 27.853, see Proposal 2-18.

Proposal 2-115. Upon further FAA review proposed Sections 27.865(a) and 29.865(a) concerning external load attaching means have been revised to preclude the necessity of considering the application of an external load at angles that will not be obtained in service. One commentator objected to the requirement for a manual mechanical control for the quick-release device. The commentator stated that this requirement was too restrictive due to the other standby electrical systems available. The FAA does not agree. Contrary to the commentator's contention the reliability of controls other than manual mechanical controls have not been sufficiently substantiated to permit their use in place of an manual mechanical control.

Proposal 2-116. One commentator objected to the proposals to add new standards concerning turbine engine installations to Sections 27.903 and 29.903 that would be substantively identical to proposed Section 23.903(b). The commentator requested that the proposals be withdrawn since helicopter service experience does not indicate that such a standard is necessary and due consideration has not been given to the differences between helicopter and airplane engine control systems. The FAA disagrees. While there are differences between helicopter and airplane engine installations, the FAA believes that the proposals would provide general design requirements relating to engine operating limitations and engine installation requirements and that these engine installation requirements should be paralleled in Parts 23, 27, and 29. Also see Proposal 2-19.

Proposal 2-117. For comments concerning proposed Section

27.917(d), see Proposal 2-163.

Proposal 2-118. The proposed change to Section 27.927 concerning the torque transmission test is related to a proposed amendment to Section 27.927 that is contained in Airworthiness Review Program, Notice No. 3: Powerplant Proposals (Notice 75-19; 40 FR 21866; May 19, 1975). The proposed amendment to Section 27.927 contained in Notice No. 2 is therefore deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-19. Comments submitted for Proposal 2-118 will be considered at that time.

Proposal 2-119. No unfavorable comments were received on the proposal to add a new Section 27.939(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-120. No unfavorable comments were received on the proposal to amend Section 27.977. Accordingly, the proposal is adopted without substantive change.

Proposal 2-121. Two commentators objected to the proposals to amend Sections 27.999(b) and 29.999(b) to require the installation of quick actuation type drain valves that are readily accessible, which can be easily opened and closed, and is either located or protected so that it will not be damaged in the event of a landing with landing gear retracted. The commentators stated that the requirement to include crash landing consideration is not considered appropriate since there are a great number of other areas which must be covered in crash landing conditions. The proposals, however, would require that the fuel system drain valves be either located or protected so that it will not be damaged in the event of a landing with landing gear retracted. There are no requirements in the proposals for consideration of crash landing conditions.

In consideration of comments discussed under Proposals 2-26, and 2-70, Sections 27.999(b)(3)(ii) and 29.999(b)(3)(ii), as adopted, have been clarified to more specifically provide a design consideration.

See Proposals 2-26 and 2-70.

Proposal 2-122. No unfavorable comments were received on the proposal to amend Section 27.1043(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-123. No unfavorable comments were received on the proposal to add a new Section 27.1093(c). The proposal as adopted has been editorially changed to agree with the format of the current section.

Proposal 2-124. No unfavorable comments were received on the proposal to add a new Section 27.1123. Accordingly, the proposal is adopted without substantive change.

Proposal 2-125. No unfavorable comments were received on the proposal to add a new Section 27.1143(d), and the proposal is adopted without substantive change. However, the heading of Section 27.1143 has been amended to reflect the contents of the section after the adoption of a new paragraph (d).

Proposal 2-126. No unfavorable comments were received on the proposal to amend Section 27.1185. Accordingly, the proposal is adopted without substantive change.

Proposal 2-127. For comments related to proposed amendment of Section 27.1322, see Proposals 2-34 and 2-82.

Proposal 2-128. The proposed change to Section 27.1325 concerning the static pressure sources is related to a proposed amendment to Section 27.1325 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and Systems Proposals (Notice 75-23; 40 FR 23048; May 27, 1975). The proposed amendment to Section 27.1325 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-23. Comments submitted for Proposal 2-128 will be considered at that time.

Proposal 2-129. The proposal for a new Section 27.1329 concerning the standards for automatic pilot systems is related to a proposed new Section 27.1311 that is contained in Airworthiness Review Program, Notice No. 5: Equipment and System Proposals (Notice 75-23; 40 FR 23048; May 27, 1975). The proposal for Section 27.1329 contained in Notice No. 2 is therefore being deferred until final rulemaking is taken with respect to the related proposal in Notice 75-23. Comments for Proposal 2-129 will be considered at that time.

Proposal 2-130. No unfavorable comments were received on the proposal to amend Section 27.1351. Accordingly, the proposal is adopted without substantive change.

Proposal 2-131. Proposed Section 27.1353(f) concerning nickel-cadmium batteries is related to a proposed amendment to Section 27.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to 27.1353(f) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-131 will be considered at that time.

Proposal 2-132. For comments related to the proposed amendment of Section 27.1385 and the withdrawal of the proposal, see Proposal 2-89.

Proposal 2-133. No unfavorable comments were received on the proposal to amend Section 27.1411. Accordingly, the proposal is adopted without substantive change.

Proposal 2-134. No unfavorable comments were received on the proposal to amend Section 27.1415(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2-135. The proposed change to Section 27.1545 concerning the V sub ne requirements is related to a proposed amendment to Section 27.1505 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 27.1545 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-135 will be considered at that time.

Proposal 2-136. For comments related to the proposed amendment of Section 27.1549, see Proposal 2-42.

Proposal 2-137. No unfavorable comments were received on the proposal to amend Section 27.1555(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-138. No unfavorable comments were received on the proposal to amend Section 27.1557(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-139. The proposal change to Section 27.1581 concerning the Airplane Flight Manual is related to a proposed amendment to Section 27.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 27.1581 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-139 will be considered at that time.

Proposal 2-140. The proposed change to Section 27.1587 is related to a proposed amendment to Section 27.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 27.1587 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-140 will be considered at that time.

Proposal 2-141. One commentator suggested that the proposed new Section 29.25(c) provisions be limited to category B rotorcraft. However no reason for the suggestion was stated. The FAA knows of no reason why the proposed provisions should be limited to category B rotorcraft. One commentator questioned the applicability of proposed new Section 29.25(c) and noted that a clarification of the applicable flight requirements was needed. For discussion of this and other comments related to the proposed new Section 29.25(c), see Proposal 2-99.

Proposal 2-142. No unfavorable comments were received on the proposal to amend Section 29.63. Accordingly, the proposal is adopted without substantive change.

Proposal 2-143. Several commentators recommended that Section 29.67(a)(1) be revised by adding the term "at V sub TOSS" following the words "feet per minute", and by deleting the phrase "without ground effect". Although paragraph (a)(1)(iv) of Section 29.67 as proposed defines the speed to be used in meeting the climb requirements of Section 29.67(a)(1) as the takeoff safety speed, the FAA does not believe that the term "V sub TOSS" is appropriate. Also, the FAA does not agree that the phrase "without ground effect" should be deleted from Section 29.67(a)(1). The FAA requires that all climb performance be conducted outside the influence of ground effect. Accordingly, the proposal is adopted without substantive change.

Proposal 2-144. No unfavorable comments were received on the proposal to amend Section 29.71. Accordingly, the proposal is adopted without substantive change.

Proposal 2-145. No unfavorable comments were received on the proposal to amend Section 29.75(b)(2). Accordingly, the proposal is adopted without substantive change.

Proposal 2-146. No unfavorable comments were received on the proposal to amend Section 29.141. Accordingly, the proposal is adopted without substantive change.

Proposal 2-147. No unfavorable comments were received on the proposal to amend Section 29.173(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-148. No unfavorable comments were received on the proposal to amend Section 29.175(d)(2)(iv). Accordingly, the proposal is adopted without substantive change.

Proposal 2-149. For comments related to the proposed amendment of Section 29.397, see Proposal 2-106.

Proposal 2-150. No unfavorable comments were received on the proposal to add a new Section 29.563. Accordingly, the proposal is adopted without substantive change.

Proposal 2-151. No unfavorable comments were received on the proposal to amend Section 29.603. Accordingly, the proposal is adopted without substantive change.

Proposal 2-152. For comments related to the proposed amendment of Section 29.685(a), see Proposal 2-109.

Proposal 2-153. No unfavorable comments were received on the proposal to add a new Section 29.733(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-154. The proposed change to Section 29.783 concerning the requirements applicable to "airstair doors" in transport category rotorcraft is related to proposed amendments to Section 25.783 that are contained in Airworthiness Review Program, Notice No. 2: Miscellaneous Proposals (Notice 75-10; 40 FR 10802; March 7, 1975) and in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75-31; 40 FR 29410; July 11, 1975). The proposed amendment to Section 25.783 contained in Notice 75-10 is being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-31. The proposed amendment to Section 29.783 contained in Notice 75-10 is therefore being deferred until final rulemaking action is taken with respect to the related proposal for Section 25.783. Comments submitted for Proposal 2-154 will be considered at that time.

Proposal 2-155. No unfavorable comments were received on the proposed new Section 29.787(d). However, based on a comment received on Proposal 2-111, this proposal has been revised to avoid any implication that lamps will be required in cargo compartments.

Proposal 2-156. No unfavorable comments were received on the proposal to add a new Section 29.801. Accordingly, the proposal is adopted without substantive change.

Proposal 2-157. For comments related to the proposed amendment Section 29.807, see Proposal 2-113.

Proposal 2-158. No unfavorable comments were received on the proposal to add a new Section 29.813(c) Accordingly, the proposal is adopted without substantive change.

Proposal 2-159. One commentator objected to the proposed change to Section 29.815 for the same reasons as presented for the proposed change to Section 25.815. The discussion of Section 25.815 in Proposal 2-62 deals with this comment.

Proposal 2-160. For comments related to the proposed amendment of Section 29.853, see Proposal 2-18.

Proposal 2-161. For comments related to the proposed new Section 29.865, see Proposal 2-115.

Proposal 2-162. No unfavorable comments were received on the proposal to amend Section 29.903(c)(1). Accordingly, the proposal is adopted without substantive change. For comments related to the proposal to add new standards concerning turbine engine installation, see Proposals 2-19 and 2-116.

Proposal 2-163. The only public comment received in

response to proposed Sections 27.917(d) and 29.917(a) recommended that the present language in Section 29.917(a) be used but gave no reason for the recommendation. The FAA believes that there should be a positive description of the cooling fans that must be considered as part of the rotor drive system. Accordingly, the proposals are adopted without substantive change.

Proposal 2-164. The proposed change to Section 29.927 concerning the torque transmission test time is related to a proposed amendment to Section 29.927 that is contained in Airworthiness Review Program, Notice No. 8: Aircraft, Engine, and Propeller Airworthiness, and Procedural Proposals (Notice 75-31; 40 FR 29410, July 11, 1975). The proposed amendment to Section 29.927 contained in Notice No. 2 is therefore deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-31. Comments submitted for Proposal 2-164 will be considered at that time.

Proposal 2-165. No unfavorable comments were received on the proposal to amend Section 29.931. Accordingly, the proposal is adopted without substantive change.

Proposal 2-166. No unfavorable comments were received on the proposal to add a new Section 29.939(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-167. No unfavorable comment was received on the proposal to amend Section 29.951(a). Accordingly, the proposal is adopted without substantive change. Also see proposal 2-68.

Proposal 2-168. No unfavorable comments were received on the proposal to amend Section 29.997. Accordingly, the proposal is adopted without substantive change.

Proposal 2-169. Based on comments concerning proposed changes to Section 25.979, proposed new paragraphs (d) and (e) of Section 29.979 have also been revised. See Proposal 2-69 for a discussion of the amendment to Section 25.979.

Proposal 2-170. One commentator objected to the proposal to Section 29.999 on the basis that the helicopter accident records do not show "any great number due to operators not draining fuel sumps." The FAA believes that this low accident rate due to water contamination in the fuel exists because most helicopters already use quick actuation drain valves.

One commentator questioned the need for proposed Section 29.999(b) noting that current Section 29.971(d) appears to have the same requirement. The FAA agrees that current Section 29.971(d) would be redundant for fuel tank sump drains and has therefore deleted the standards for the fuel tank slump drain in Section 29.971(d).

The fuel drain standards in Section 29.999(b) as proposed are applicable to each drain required by Section 29.999(a)

including the drains prescribed in Section 29.971, but to avoid misinterpretation the section as adopted is clarified to specifically note the fuel tank sump drains prescribed in Section 29.971.

Also see Proposals 2-26, 2-70, and 2-121.

Proposal 2-171. One commentator stated that proposed Section 29.1041(a) should be revised to except "ground use only" auxiliary power units (APU's). The FAA disagrees. APU's that are permitted to operate only on the ground have inadvertently continued to operate in flight. Safe operation of APU's requires consideration of ground, water, and flight operating conditions. The proposal is therefore, adopted without substantive change.

Proposal 2-172. No unfavorable comments were received on the proposals to amend Section 29.1043(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-173. No unfavorable comments were received on the proposal to add a new Section 29.1093(c). The proposal as adopted has been editorially changed to agree with the format of the current section.

Proposal 2-174. For comments related to the proposed amendment of Section 29.1125, see Proposals 2-29 and 2-75.

Proposal 2-175. No unfavorable comment was received on the proposal to amend Section 29.1143 and the proposal is adopted without substantive change. However, the heading of Section 29.1143 has been amended to reflect the contents of the section after the addition of a new paragraph (e).

Proposal 2-176. No unfavorable comments were received on the proposal to amend Section 29.1165(f). Accordingly, the proposal is adopted without substantive change.

Proposal 2-177. Two commentators objected to the selective use of Part 33 requirements in the proposal for a new Section 29.1167 that would provide substantiation requirements for accessory gearboxes that are not certificated as part of an engine. The FAA proposed to amend Part 29 like Part 25 for consistency. The FAA now believes that the proposed new Section 29.1167 is inappropriate in view of the requirements to substantiate the rotor drive system including gearboxes under the rotor drive system endurance test requirements. Therefore, proposed new Section 29.1167 is withdrawn.

Proposal 2-178. No unfavorable comments were received on the proposal to amend Section 29.1189(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-179. No unfavorable comments were received on the proposal to amend Section 29.1197(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-180. For comments related to the proposed amendment of Section 29.1303(d), see Proposal 2-79.

Proposal 2-181. No unfavorable comments were received on the proposal to amend Section 29.1307. Accordingly, the proposal is adopted without substantive change.

Proposal 2-182. For comments related to proposed amendment of Section 29.1322, see Proposals 2-34 and 2-82.

Proposal 2-183. For comments related to the deferral of proposed Section 29.1325, see Proposal 2-35.

Proposal 2-184. The proposed change to Section 29.1329 concerning automatic pilot systems is related to a proposed new Section 29.1311 that is contained in Airworthiness Review Program Notice No. 5: Equipment and Systems Proposals (Notice 75-23; 40 FR 23048; May 27, 1975)). The proposal for Section 29.1329 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-23. Comments submitted for Proposal 2-184 will be considered at that time.

Proposal 2-185. The proposed change to Section 29.1337 concerning the auxiliary power unit instrument lines is related to a proposed amendment to Section 29.1337 that is contained in Airworthiness Review Program, Notice No. 3: Powerplant Proposals (Notice 75-19; 40 FR 21866, May 19, 1975). The proposed amendments to Section 29.1337 contained in Notice No. 2 is therefore deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-19. Comments submitted for Proposal 2-185 will be considered at that time.

Proposal 2-186. Proposed Section 29.1353(c)(5) concerning nickel-cadmium batteries is related to a proposed amendment to Section 29.1585 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 29.1353(c)(5) contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-186 will be considered at that time.

Proposal 2-187. For comments related to the proposed amendment of Section 29.1385 and the withdrawal of the proposal, see Proposal 2-89.

Proposal 2-188. The proposal for Section 29.1545 concerning V sub ne requirements is related to a proposed amendment to Section 29.1505 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 29.1545 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-188 will be

considered at that time.

Proposal 2-189. For comments related to the proposed amendment of Section 29.1549, see Proposal 2-42.

Proposal 2-190. No unfavorable comments were received on the proposal to amend Section 29.1555(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-191. No unfavorable comments were received on the proposal to amend Section 29.1557(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-192. The proposed change to Section 29.1581 concerning the Airplane Flight Manual is related to a proposed amendment to Section 29.1581 that is contained in Airworthiness Review Program, Notice No. 6: Flight Proposals (Notice 75-25; 40 FR 24664; June 9, 1975). The proposed amendment to Section 29.1581 contained in Notice No. 2 is therefore being deferred until final rulemaking action is taken with respect to the related proposal in Notice 75-25. Comments submitted for Proposal 2-192 will be considered at that time.

Proposal 2-193. No unfavorable comments were received on the proposal to amend Section 31.1. Accordingly, the proposal is adopted without substantive change.

Proposal 2-194. No unfavorable comments were received on the proposal to amend Sections 31.11 and 31.20. Accordingly, the proposal is adopted without substantive change.

Proposal 2-195. No unfavorable comment was received on the proposal to add a new Section 31.14 concerning weight limits of manned free balloons. Therefore, the section is adopted without substantive change.

Proposal 2-196. No unfavorable comments were received on the proposal to amend Section 31.45. Accordingly, the proposal is adopted without substantive change.

Proposal 2-197. No unfavorable comments were received on the proposal to add a new Section 31.46. Accordingly, the proposal is adopted without substantive change.

Proposal 2-198. No unfavorable comments were received on the proposal to amend Section 31.63. Accordingly, the proposal is adopted without substantive change.

Proposal 2-199. No unfavorable comments were received on the proposal to amend Section 31.85. Accordingly, the proposal is adopted without substantive change.

Proposal 2-200. No unfavorable comments were received on the proposal to amend Section 33.1. Accordingly, the proposal is adopted without substantive change.

Proposal 2-201. No unfavorable comments were received on the proposal to amend Section 35.1. Accordingly, the proposal is adopted without substantive change.

Proposal 2-202. No unfavorable comments were received on the proposal to amend Section 35.39. Accordingly, the proposal is adopted without substantive change.

Proposed 2-203. No unfavorable comments were received on the proposal to amend Section 35.41(e). Accordingly, the proposal is adopted without substantive change.

Proposed 2-204. No unfavorable comments were received on the proposal to amend Section 35.45(a). Accordingly, the proposal is adopted without substantive change.

Proposed 2-205. No unfavorable comments were received on the proposal to amend Section 91.14. Accordingly, the proposal is adopted without substantive change.

Proposed 2-206. No unfavorable comments were received on the proposal to amend Section 91.21(a). Accordingly, the proposal is adopted without substantive change.

Proposal 2-207. One commentator suggested that the proposed change to Section 91.33(d)(6) concerning clock requirements should use the language of Section 121.305. The FAA believes that a standard should be specified in Section 91.33(d)(6) for digital clocks and the proposal as adopted provides a specific standard. See Proposal 2-79.

Proposal 2-208. The intent of the proposed new Section 91.193(g) is to require protective breathing equipment that would meet the standards proposed for Section 25.1439(b) on certain airplanes operated under Part 91 Subpart D. Based on the current testing being conducted on this type of equipment, the FAA is developing new standards for a later rulemaking action. The proposal for Section 25.1439(b)(2)(ii) is being withdrawn (See Proposal 2-91). Therefore, the FAA believes that the proposal for Section 91.193 is premature, and the proposal is withdrawn.

Proposal 2-209. Although no unfavorable comment was received on the proposed revision of Section 91.209, the FAA believes that revision of similar ice protection provision in Section 135.85 may be necessary. Amendments to Sections 91.209 and 135.85 should be considered together. Therefore, the proposed change to Section 91.209 is withdrawn.

Proposal 2-210. No unfavorable comments were received on the proposal to amend Section 121.171(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2-211. No unfavorable comments were received on the proposal to amend Section 121.199. Accordingly, the proposal

is adopted without substantive change.

Proposal 2-212. No unfavorable comments were received on the proposal to amend Sections 121.331(b) and 121.333(b). Accordingly, the proposal is adopted without substantive change.

Proposal 2-213. The intent of proposed Section 121.337(d) is to require protective breathing equipment that would meet the proposed requirements of Section 25.1439(b) installed in certain airplanes operated under Part 121. However, proposed Section 25.1439(b)(2)(ii) is withdrawn in the notice. Based on the current testing being conducted on this type of equipment, the FAA is developing new standards fora later rulemaking action. The FAA therefore believes that the proposed change to Section 121.337 is premature and the proposal is withdrawn. Also see Proposal 2-91.

Proposal 2-214. No unfavorable comments were received on the proposal to amend Section 127.105. Accordingly, the proposal is adopted without substantive change.

Proposal 2-215. No unfavorable comments were received on the proposal to add a new Section 127.106. Accordingly, the proposal is adopted without substantive change.

Proposal 2-216. One commentator objected to the proposed amendment to Section 133.1. The commentator stated that the proposal specifically eliminates the reference to airworthiness certification rules when, in fact, Subpart D is retained intact except for the standards for external-load attaching means and quick-release devices. The FAA agrees that reference to airworthiness requirements should not be deleted without other changes to Part 133, and the proposal is withdrawn.

Proposal 2-217. One commentator objected to the proposed amendment to Section 133.41(c)(6). However no reason for the objection was stated. The proposal is therefore adopted herein without substantive change.

Proposal 2-218. One commentator requested that proposed Section 133.43(a) be revised to provide for the use of external-load attaching means previously approved under Part 133. The FAA agrees and proposed Section 133.43 is revised accordingly.

Proposal 2-219. No unfavorable comments were received on the proposal to amend Section 133.45(c). Accordingly, the proposal is adopted without substantive change.

Proposal 2-220. No unfavorable comments were received on the proposal to amend Section 135.71(a)(5). Accordingly, the proposal is adopted without substantive change.

Proposal 2-221. Based upon further review by the FAA proposed Section 135.165(b)(2) is being withdrawn because contrary to the explanation for the proposal in Notice 75-10, the

proposal would result in unjustifiably different standards for transport category airplanes operated under Part 135 and those operated under Part 121.

(Secs. 313(a), 601, 603, 604, and 605 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425); sec. 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

In consideration of the foregoing, and for the reasons stated in Notice 75-10, Parts 21, 23, 25, 27, 29, 31, 33, 35, 91, 121, 127, 133, and 135 of the Federal Aviation Regulations are amended as follows, effective February 1, 1977.

The Federal Aviation Administration has determined that this document does not contain a major proposal requiring preparation of an Inflation Impact Statement under Executive Order 11821 and OMB Circular A-107.

Amendment 21-45

Issuance of Special Flight Permits with a Continuing Authorization to Air Taxi Operators of Large Aircraft

Adopted: September 21, 1977 Effective: October 28, 1977

(Published in 42 FR 51561, September 29, 1977)

SUMMARY: This amendment provides for the issuance of special flight permits with a continuing authorization to air taxi operators of large aircraft. In the past, these operators have been required to apply for special flight permits individually before operating their large aircraft, that might not meet applicable airworthiness requirements but are capable of safe flight, to a base where maintenance or alterations are to be performed. Since air taxi operators of large aircraft must maintain their large aircraft under a continuous airworthiness maintenance program and their operations must be covered under operations specifications, the requirements that these operators must apply for special flight permits individually is not necessary.

FOR FURTHER INFORMATION CONTACT:

Raymond E. Ramakis, Regulatory Projects Branch, Safety Regulations Division, Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; Telephone (202) 755-8716.

SUPPLEMENTARY INFORMATION:

Section 21.197(c) provides, in pertinent part, for the issuance of a special flight permit with a continuing

authorization to Part 121 and 127 certificate holders. Special flight permits, with continuing authorizations, that are issued pursuant to Section 21.197(c), are included in the certificate holder's operations specifications, along with the conditions and limitations associated with the authorization. The purpose of Section 21.197(c) is to eliminate the unnecessary burden, on Part 121 and 127 certificate holders and the FAA, of individually dealing with each of a relatively large number of special flight permits that those operators need for ferrying aircraft to bases where maintenance can be performed. By virtue of the continuous airworthiness maintenance program used by these operators and their operations specifications, procedures have been established to provide for the issuance of special flight permits with continuing authorizations for such ferry flights while ensuring that the flights are conducted safely.

Air taxi operators of large aircraft are required by Section 135.2 to comply with the certification and operation requirements for supplemental air carriers as set forth in Part 121, unless compliance with the Part 121 rules applicable to domestic or flag carriers is required under specified circumstances. In any event, large aircraft operated under the provision of Section 135.2 must be maintained under a continuous airworthiness maintenance program and operations conducted under Section 135.2 must be covered in the certificate holder's operations specifications as provided in Part 121. Therefore, the reasons for providing for the issuance of special flight permits with continuing authorizations to Part 121 and 127 certificate holders are equally applicable to air taxi operators operating under the provisions of Section 135.2 with respect to their large aircraft.

This amendment is based on a Notice of Proposed Rule Making (Notice No. 76-8) published in the Federal Register on April 5, 1976, (41 FR 14392) which proposed to provide for the issuance of special flight permits with a continuing authorization to air taxi operators of large aircraft. That Notice invited comment by all persons interested in the making of the proposed rule. All interested persons have been afforded an opportunity to participate in the making of this amendment, and due consideration has been given to all matter presented. Three commentators responded to Notice 76-8, none of which expressed disapproval of the intent of the proposal. However, one commentator suggested that rather than issuing a continuing authorization to operators, the FAA should amend the regulation to allow such operations without the necessity of obtaining a special permit. The FAA does not agree with this proposed change since the aircraft involved may not meet airworthiness requirements and special operating restrictions may be necessary which would be covered in special flight permits. This amendment is the same as proposed in Notice 76-8.

The principal authors of this document are Mr. H. Keyzer-Andre, Flight Standards Service, and Mr. Phillip Kolczynski and Mr. Samuel Podberesky, Office of the Chief Counsel.

ADOPTION OF AMENDMENT

Accordingly, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended effective October 28, 1977, by revising section 21.197(c).

Secs. 313(a), 601, 603 and 604, Federal Aviation Act of 1958, as amended, (49 U.S.C. 1354(a), 1421, 1423, and 1424); and Sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c))|.

The Federal Aviation Administration has determined that this document does not contain a major proposal requiring preparation of and Economic Impact Statement under Executive Order 11821, as amended by Executive Order 11949, and OMB Circular A-107.

Amendment 21-46

Airworthiness Review Program

Amendment No. 6: Flight Amendments

Adopted: January 9, 1978 Effective: March 1, 1978

(Published in 43 FR 2302, January 16, 1978)

SUMMARY: The purpose of these amendments to the Federal Aviation Regulations is to update and improve - (1) the airworthiness standards applicable to aircraft performance, flight characteristics, flight manuals, and operating limitations; (2) the operating rules containing related airworthiness standards; and (3) the rules governing holders of type certificates. These amendments are part of the Airworthiness Review Program.

FOR FURTHER INFORMATION CONTACT:

Adolfo O. Astorga, Airworthiness Review Branch (AFS-910), Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; telephone (202) 755-8714.

SUPPLEMENTARY INFORMATION: These amendments are the sixth in a series of amendments to be issued as part of the Airworthiness Review Program. The following series of amendments have previously been issued as part of this Airworthiness Review Program:

Title	FR citation
Form number and clarifying revisions.	(40 FR 2576; Jan. 14, 1975).
Rotorcraft anticollision light standards.	(41 FR 5290; Feb. 5, 1976).

Miscellaneous amendments.	(41 FR 55454; Dec. 20, 1976).
Powerplant amendments.	(42 FR 15034; March 17, 1977).
Equipment and systems amendments.	(42 FR 36960; July 18, 1977).

These amendments are based on two Notices of Proposed Rule Making - Notice 75-10 published in the FEDERAL REGISTER on March 7, 1975 (40 FR 10802); and Notice 75-25 published in the FEDERAL REGISTER on June 9, 1975 (40 FR 24664). The amendments based on Notice 75-10 were deferred in the series of amendments titled "Miscellaneous Amendments" so that they could be considered with the final disposition of certain proposals in Notice 75-25. The discussions of the comments received for the deferred proposals are included under the heading of the related Notice 75-25 proposals.

Interested persons have been afforded an opportunity to participate in the making of these amendments and due consideration has been given to all matters presented. A number of substantive changes and changes of an editorial and clarifying nature have been made to the proposed rules based upon relevant comments received and upon further review within the FAA. Except for minor editorial and clarifying changes and the substantive changes discussed below, these amendments and the reasons for them are the same as those contained in Notices 75-10 and 75-25.

DISCUSSION OF COMMENTS

The following discussion is keyed to the like-numbered proposals contained in Notice 75-25.

Proposal 6-1. No unfavorable comments were received on the proposal to amend Section 1.1 by deleting the term "Accelerate-stop distance" and its definition. Accordingly, the proposal is adopted without substantive change.

Proposal 6-2. For a comment related to the proposal to amend Section 1.2, see Proposal 6-34.

Proposal 6-3. One commentator suggested that proposed new Section 21.5 concerning Airplane and Rotorcraft Flight Manuals be revised to make clear that other titles for the required Flight Manual, such as Pilot's Operating Handbook, will continue to be approved. The FAA has no objection to the use of the term Pilot's Operating Handbook as the main title. However, if an applicant chooses to use the title Pilot's Operating Handbook, he must include a statement on the title page indicating that the document is the FAA-required Airplane or Rotorcraft Flight Manual.

The same commentator pointed out that on airplanes of types for which Flight Manuals were not furnished in the past, much of the required information was furnished on placards and markings,

and that, if this proposal is adopted, some of the placards would no longer be needed but would still be part of the airplane's certification basis. The FAA agrees that some placards may not be necessary after the information is furnished in a Flight Manual. However, application may be made to change the type design if the applicable regulations only require that the material be in either a Flight Manual or in any combination of approved manual materials, markings, and placards.

The same commentator also stated that proposed Section 21.5(b) would penalize airplanes that were designed and tested to temperatures higher than the hot day condition prescribed in Section 23.1043(b)(1). The FAA does not agree because the temperature for which cooling was demonstrated would be furnished in the Flight Manual as information, not as a limitation. It should be noted that in response to Proposal 6-29, this commentator stated that there is no objection to furnishing the test temperature if it is not a limitation.

Two commentator stated that it should be made clear that, for rotorcraft originally certificated with a flight manual, the manual originally approved need not be revised to include the new requirements of this proposal. The FAA does not believe a revision is necessary since proposed Section 21.5(b), in conjunction with proposed Section 21.5(a), refers only to airplanes or rotorcraft that were not type certificated with an Airplane or Rotorcraft Flight Manual.

Another commentator said that requiring Flight Manuals to be furnished for aircraft previously type certificated without a Flight Manual places too large a burden on the holders of these type certificates. The FAA does not agree since the information to be included in the Flight Manual has already been furnished in other forms. In addition, a Flight Manual would provide the operator with essential information in a consolidated, organized form suitable for study and reference. The FAA believes that these benefits outweigh the burden of preparing and printing the Manual.

One commentator, who concurred with the proposal, recommended that the turbulent air penetration speed, least angle of glide speed, and least rate of descent speed (power off) be added to the required information. These are specific requirements which are not applicable to all categories of aircraft and the FAA does not believe they should be included in the rule.

The phrase "maximum anticipated air temperature" in proposed Section 21.5(b)(2) is deleted and the phase "maximum ambient atmospheric temperature" is inserted in its place to be consistent with Proposal 6-20 to amend Section 23.1043 and the corresponding proposals for the other certification parts, which are being adopted in this series of amendments.

The proposal to add a new Section 21.5 is adopted with the

revision discussed above.

Proposal 6-4. For comments related to the proposal to amend Section 23.25(b), see Proposal 6-5. The proposal to amend Section 23.25(b) is adopted without substantive change.

Proposal 6-5. One commentator objected to the proposal to amend Section 23.29, which would require the empty weight to be determined with "full" operating fluids, on the ground that this procedure would eliminate the option of "off loading" oil in order to maintain weight and center of gravity limits. The FAA does not agree. This option would not be eliminated by proposed Section 23.29 since it merely established a new reference basis for empty weight. The same commentator stated that since this proposed rule is not retroactive, confusion will result because some aircraft will have oil included in the weight and balance and others will not. This commentator also suggested that use of the same definition of empty weight by the FAA and the military would eliminate the difficulties encountered by pilots operating both military and civil aircraft. The FAA does not believe that the proposed change will cause confusion or difficulty in either situation cited by the commentator since the weight and balance data accompanying each airplane will specify whether oil is included in the empty weight. Further, this procedure should simply weight and balance computations since fluids normally included will be accounted for without further additions to the empty weight.

One commentator objected to the proposals to amend Sections 27.29 and 29.29 on the ground that there is no benefit to be gained by changing the definition of empty weight. The FAA does not agree with this comment for the reasons stated in the Notice for these proposals. This commentator further objected to the proposal to amend Section 27.29 on the ground that it would create a problem for helicopters that have a larger oil tank capacity than is required under all conditions, such as helicopters designed to accept auxiliary fuel tanks. The option of off-loading oil would not be eliminated by proposed Section 27.29. In addition, the FAA believes that the change will accomplish its purpose of simplifying weight and balance computations for the great majority of helicopters.

Several commentators on the proposal to amend Section 25.29 noted that the proposed rule would require certain fluids which, in transport category airplanes, are variable as a function of individual operator or mission requirements and of passenger

seating density (such as potable water and lavatory pre-charge fluids) to be included in the empty weight. It was suggested that an exception be provided for those fluids that vary with operation or mission as well as those that are expendable in flight such as water intended for injection in the engines. The FAA believes that exceptions for the specific fluids noted are warranted for airplanes, but the FAA does not believe that an exception is appropriate for potable water or lavatory pre-

charge water for rotorcraft. The proposals to amend Sections 23.29 and 25.29 are revised accordingly.

Proposal 6-6. A commentator objected to the proposed change to Section 23.45, stating that a requirement to correct the performance to 80 percent relative humidity is not necessary, that it would increase the cost and complexity of certification without any increase in safety, and that it will create a new standard atmosphere that will result in confusion as to the basis for engine performance data. The power loss that is associated with changing from dry air to air at 80 percent relative humidity would cause a significant reduction in the climb performance of a reciprocating-engine powered airplane and should be considered. This reduction would be most evident where performance is marginal, e.g., during one-engine-inoperative climb. With regard to turbine engines, the FAA believes that the effect of humidity may be negligible on some types of engines, in which case no performance correction would be necessary. However, for some other types of turbine engines, a correction for humidity will increase the accuracy of the performance data. The FAA believes that the data required for making the corrections can be obtained simply and with inexpensive instrumentation. Further, the FAA does not believe that requiring a correction for humidity in the performance data for newly type-certificated airplanes will result in confusion. A transition period may exist during which the performance data for newly type-certificated airplanes will be corrected for humidity and that for other airplanes may not be. Such transition periods inevitably occur with the adoption of new regulatory provisions and the FAA does not believe that the transition in this case will present a significant problem.

The commentator further stated that present performance measurement accuracy is within the range of uncontrolled airplane-to-airplane variations, atmospheric variations other than humidity, and piloting variations, and that eliminating one variable whose effect is within the spread of other variables is not justifiable on a simple cost-benefit analysis. The FAA does not agree that the humidity correction should be omitted on the basis of conjecture that other variables may mask its effect. Certification flight testing is not allowed when atmospheric variables would affect data accuracy, and tests must be repeated as necessary to establish confidence in data accuracy.

In regard to the burden of correcting for humidity in type certification, the FAA believes that it should in many cases be possible to show that the effect of humidity is not significant or that it is covered by a conservative correction factor. Correction of performance data to standard atmospheric conditions of temperature and pressure is required in any case, and an additional correction for humidity should be a relatively small burden.

The proposal for Section 23.45 is adopted without substantive change.

Proposal 6-7. No unfavorable comments were received on the proposal to amend Section 23.49. Accordingly, the proposal is adopted without substantive change.

Proposal 6-8. One commentator suggested that, for consistency with certain foreign requirements, proposed Sections 23.51(c)(1)(ii) and (c)(2)(i) should be revised to read 1.2 V sub s1, instead of 1.3 V sub s1. The FAA does not believe that the recommended change is necessary. Proposed Sections 23.51(c)(1)(ii) and (c)(2)(i) already provide for a speed less than 1.3 V sub s1.

The first commentator also stated that proposed Section 23.51(c)(1)(ii) should be revised so that it refers to the complete failure of a single engine (on multi-engine airplanes) instead of complete engine failure which would introduce a double failure concept not inherent in these rules. The FAA does not agree. Proposed Section 23.51(c)(1)(ii), which is consistent with current Section 23.51(a)(2)(ii) in this regard, only requires that "complete engine failure" be investigated if a speed of less than 1.3 V sub s1, is demonstrated at a height of 50 feet. In addition, current Section 23.51(a)(2)(ii) has been consistently interpreted to require that for multi-engine airplanes which meet the powerplant isolation requirements of Section 23.903(c) in the takeoff configuration, only one engine need be made inoperative in the specified investigations.

One commentator objected to the extension of takeoff performance determination requirements to airplanes of 6,000 pounds and less maximum weight, for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For discussion of these comments, see Proposal 6-3.

Another commentator recommended that those provisions of the existing rule which relate to nosewheel and tailwheel liftoff speeds be retained and that their applicability be extended to all airplanes. These provisions were originally imposed in lieu of a requirement for approved takeoff performance data airplanes of 6,000 pounds and less maximum weight. In view of the requirements which are being adopted, and in view of satisfactory service history for airplanes of more than 6,000 pounds maximum weight, the FAA does not believe these provisions should be retained or that their applicability should be extended to all airplanes.

The proposal to revise Section 23.51 is adopted without substantive change.

Proposal 6-9. One commentator objected to the application of proposed Section 23.65, concerning all-engines operating climb requirements, to airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6-3.

Another commentator stated that use of a reduced propeller pitch under proposed Section 23.65(b) is not consistent with safety requirements, because it would either deny the pilot performance in actual operation or the protection of limiting the engine to a safe speed. The FAA does not agree. Present Section 23.33 defines the pitch and speed limitations for propellers which are to be used in service. Proposed Section 23.65(b), which is identical to the present Section 23.65(a)(2), merely authorizes the use of a special test propeller pitch setting if it is necessary to obtain rated engine r.p.m. at V sub x.

In proposed Section 23.65(c), reference to the airplane configuration was inadvertently omitted. The configuration should be the same as that specified in proposed Section 23.65(a), and proposed Section 23.65(c) is therefore revised to state that the climb gradient is to be met with the airplane in the configuration prescribed in paragraph (a). In addition, Section 23.65(a)(4) is revised to cover means other than cowl flaps for controlling the engine cooling air supply. This change is necessary to provide for turbine engines. The proposal to revise Section 23.65 is adopted with the revisions discussed above.

Proposal 6-10. One commentator suggested that a speed to be used in calculating the climb gradients should be specified in proposed Section 23.67(c) for purposes of uniformity, but did not make a specific proposal. The FAA believes that the applicant should be allowed to select a climb speed if the airplane meets the minimum gradient and rate of climb at that speed. The proposal to amend Section 23.67 is adopted without substantive change.

Proposal 6-11. One commentator objected to the application of proposed Section 23.75, concerning landing distance requirements, to airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6-3. This commentator also stated that proposed Section 23.75(e), concerning wheel brake pressures, is a design requirement and should therefore be placed in Subpart D of Part 23. The FAA does not agree because proposed Section 23.75(e) refers to the pressures used in determining the landing performance. The commentator further suggested that the FAA should consider issuing advisory material as to what is considered safe and reliable under proposed Section 23.75(f). The wording of proposed Section 23.75(f) is the same as that of present Section 25.75(b)(3), and this wording has been administered without difficulty for many years. However, the FAA will consider issuing advisory material at a future date if the need is shown.

Another commentator stated that he would not support the inclusion of reverse thrust as an acceptable "other means" of retarding the airplane in determining the landing distance under proposed Section 23.75(f), because the landing distance is

demonstrated on a dry runway with no provision for a field length factor. The FAA agrees that the effect of wet runways would have to be taken into account in any determination that a means of retarding the airplane is safe and reliable and that consistent results can be expected in service use. It should be noted that proposed Section 23.1587(a)(6) (Proposal 6-31), as adopted, requires that the kind of surface used in the landing distance tests be described in the Airplane Flight Manual. The proposal to revise Section 23.75 is adopted without substantive change.

Proposal 6-12. One commentator objected to the application of proposed Section 23.77, concerning balked landing performance, to airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6-3. Proposed Section 23.77 is adopted without substantive change.

Proposals 6-13 and 2-6. One commentator stated that the option in proposed (and current) Section 23.149(a) for the applicant to choose zero yaw or an angle of bank is inconsistent because straight flight with zero yaw (zero sideslip) can only be achieved with some degree of bank. The FAA agrees that bank may be needed to establish straight flight with zero yaw following the failure of a powerplant at low airspeed. The proposed language is the same as that of the current rule and an angle of bank of up to 5 degrees to maintain straight flight has been allowed under the current rule. The directional controllability that must be provided for compliance with Sections 23.147 and 23.205 ensures that bank angles up to 5 degrees under these flight conditions will not be accompanied by excessive yaw angles. Certain design or control features may influence the use of roll control immediately following the failure of a powerplant. Therefore, the proposal (as well as the current rule) allows reference to a zero yaw angle, without bank, for determining the V sub mc of airplanes which incorporate such features.

Section 23.149(a) is revised in accordance with the discussion of Proposal 6-41 with respect to the modes of failure which must be simulated in demonstrating V sub mo. The revision requires that the method used to simulate critical engine failure must represent the most critical mode of powerplant failure with respect to controllability that is expected in service, rather than (all) modes of powerplant failure expected in service.

Proposal 2-6 to amend Section 23.149(b) (Notice 75-10) was reproposed in Proposal 6-13 for the purpose of clarity. No unfavorable comments were received on proposed Sections 23.149(b), (c), and (d), and they are adopted without substantive change.

Proposal 6-14. One commentator objected to the application of proposed Section 23.161 to airplanes of 6,000 pounds and less maximum weight for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For a discussion of these comments,

see Proposal 6-3.

Since Section 23.21(a) requires that each requirement of this subpart must be met at each appropriate combination of weight and center of gravity within the range of loading conditions for which certification is requested, proposed Section 23.161(a)(2)(ii) is revised by deleting the reference to center of gravity and proposed Section 23.161(c)(2)(iii) is withdrawn.

Proposal 6-15. No unfavorable comments were received on the proposal to amend Section 23.177. Accordingly, the proposal is adopted without substantive change. For comments related to the proposal to amend Section 23.177, see Proposal 6-16.

Proposal 6-16. One commentator objected to proposed Section 23.181(b), which would require that short period lateral or directional oscillations and combined lateral-directional oscillations ("Dutch roll") be damped to 1/10 amplitude in 7 cycles. The commentator stated that this proposal is more stringent with regard to combined lateral-directional oscillations than proposed Section 25.181 (Proposal 6-43) and that proposed Section 25.181 retains certain necessary requirements for other short period oscillations that are not contained in proposed Section 23.181. Proposed Section 25.181(a) would require that oscillations other than combined lateral-directional oscillations be heavily damped, and proposed Section 25.181(b) would require combined lateral-directional oscillations to be positively (but not heavily) damped. The FAA agrees that a similar distinction should be made in Section 23.181 between combined lateral-directional ("Dutch roll") oscillations and other longitudinal, lateral, and directional oscillations.

Current Sections 23.177(a)(4) and (b)(3) (which are deleted by Proposal 6-15) require any short period lateral or directional oscillation to be heavily damped. After considering the comment and after further review, the FAA believes that the current requirement for heavy damping should be retained for short period lateral and directional oscillations other than "Dutch roll" (combined lateral-directional) oscillations. With respect to combined lateral-directional oscillations, the FAA believes that these oscillations do not need to be heavily damped and that the proposed requirements for Part 23 airplanes would provide a satisfactory damping ratio.

The FAA believes the difference between Part 23 and Part 25 requirements with respect to combined lateral-directional oscillations is justified since airplanes certificated under Part 25 have very large variations in size, weight, and moment of inertia, which affect the lateral-directional characteristics and pilot reaction to these characteristics. The FAA therefore believes that it is appropriate that the damping requirement in Section 25.181(b) be stated in general terms, as reflected in Proposal 6-43.

The proposal to amend Section 23.181 is adopted with the revisions discussed above.

Proposal 6-17. Proposed new Section 23.183 would establish a limit on the rate of spiral divergence by requiring that the angle of bank may not increase to more than 40 degrees in less than 12 seconds after the controls are released in a 20-degree banked turn under specified conditions. One commentator objected to the proposal stating that no need had been shown for the proposal and that the tests referred to in the notice were not definitive. After comparing available data on the subject of spiral divergence, the FAA believes that rulemaking on this subject is premature. Accordingly, the proposal to add a new Section 23.183 is withdrawn.

Proposal 6-18. Many comments were received on the proposal to amend Section 23.221. In view of the conflicting views expressed in these comments, and after further consideration by the FAA, the FAA believes that the proposal to amend Section 23.221 is premature, and it is withdrawn.

Proposal 6-19. One commentator stated that the proposal to amend Section 23.729(f)(1) is redundant and that the requirement proposed is already in effect. The FAA does not agree with the comment for the reasons stated in the notice.

The proposal to amend Section 23.729(f)(1) is adopted as proposed except that the last three words, "the aural warning", of the proposed sentence are replaced with the words "the warning device" so that the wording of the sentence is consistent with the remainder of Section 23.729(f).

For other comments related to the proposal to amend Section 23.729, see Proposal 6-51.

Proposal 6-20. For comments related to the proposal to revise Section 23.1043(b), see Proposal 6-23.

Proposal 6-21. One commentator objected to the proposal to amend Section 23.1047 for reasons stated in his comments on Proposal 6-3, concerning Flight Manuals. For a discussion of these comments, see Proposal 6-3. The proposal to amend Section 23.1047 is adopted without substantive change.

¢For discussion concerning new Section 23.1353(g), see Proposals 6-57 and 2-87.|

Proposal 6-22. No unfavorable comments were received on the proposal to revise Section 23.1501. Accordingly, the proposal is adopted without substantive change.

Proposal 6-23. The proposal to revise Section 23.1521(e) is one proposal in a series of proposals on powerplant cooling requirements and ambient temperature operating limitations and information for Parts 23, 25, 27, and 29 aircraft. This series

consists of proposals 6-20, 6-23, 6-29, 6-52, 6-54, 6-56, 6-68, 6-71, 6-74, 6-82, 6-85, and 6-88.

Proposed Section 23.1521(e) in conjunction with proposed Section 23.1043(b) (Proposal 6-20) would require that an ambient temperature operating limitation be established as the maximum atmospheric temperature at which compliance with the powerplant cooling requirements is shown. In response to these proposals, one commentator stated that no justification for safety or other reasons has been presented for establishing the proposed operating limitations, and that he believes that no safety justification exists. The commentator also stated that the FAA cooling tests and correction factors are very conservative, that it would be necessary to correct cooling tests to at least the equivalent of 125 degrees F at sea level to avoid restrictive operating limitations, and that this would result in increased cooling drag and poorer performance. Another commentator, in regard to proposed Section 27.1521(f) (Proposal 6-71), also stated that an ambient temperature limitation has not been shown to be necessary.

After considering these comments, and after further review, the FAA believes that it does not now have enough information to justify the proposed requirements for reciprocating engines in Part 23 airplanes and Part 27 rotorcraft. However, because of the differences between reciprocating and turbine engine installations, particularly in regard to engine components and accessories, and because of the effects of high temperature operation on turbines, Part 23 already requires the establishment of ambient temperature limitations for turbine engines, and for the same reasons the FAA believes that ambient temperature limitations for turbine engines should also be established for Part 27 helicopters. Parts 25 and 29 already require temperature limitations for reciprocating engines (as well as turbine engines) because the reciprocating engines in these aircraft are generally more complex than those used in Part 23 and Part 27 aircraft.

Accordingly, proposed Sections 23.1521(e) and 27.1521(f) are revised to require the establishment of ambient atmospheric temperature limitations for turbine but not for reciprocating engines and proposed Sections 25.1521(e) and 29.1521(e) are adopted without substantive change. In addition, proposed Sections 23.1043(b), 25.1043(b), 27.1043(b), and 29.1043(b), as adopted, are revised to omit the reference to a limitation on the operation of the aircraft, since the establishment of ambient temperature operating limitations is prescribed in proposed Sections 23.1521(e), 25.1521(e), 27.1521(f), and 29.1521(e). For reciprocating engines, Sections 23.1587 and 27.1587 are revised to require that the maximum ambient air temperature for which compliance with the engine cooling requirements was shown must be included in the performance information section of the Flight Manual.

One commentator recommended that the 100-degrees F minimum

in proposed Section 25.1043(b) be deleted, since the ambient temperature at which compliance with the cooling requirements is shown becomes an operating limitation on the airplane and airworthiness is not affected as long as the limitation is followed. The FAA believes that the 100-degree F minimum is appropriate since a lower temperature would be impractical and unrealistic considering summer operations in the United States. It should be noted that an exception to the minimum is provided for winterization installations.

This commentator also stated that the explanation for proposed Section 25.1043(b) implies that only a test demonstration at 100 degrees F or higher is acceptable. This is incorrect. Section 23.1043(a)(1) and corresponding provisions in Parts 25, 27, and 29 clearly indicate that tests may be conducted under other conditions and corrected to the prescribed conditions.

One commentator recommended the deletion of the requirements in proposed Sections 27.1583(b) and 29.1583(b) for an explanation of the powerplant limitations in the Airplane Flight Manual, since such explanations would be redundant. A similar comment was received in response to proposed Section 25.1583(b). The intent of the proposals was not to require an explanation of each limitation. A separate explanation would not be necessary for a limitation that is self-explanatory. For clarification, proposed Sections 23.1583(b)(2), 25.1583(b)(2), 27.1583(b)(2), and 29.1583(b)(2) are revised to require an explanation of limitations "when appropriate."

In regard to proposed Section 23.1583(b), one commentator stated that contrary to the FAA statement in the notice, the establishment of the test temperature as a limitation has not been required in the past and should not be a limitation. The FAA disagrees. Current Section 23.1583(j) requires that, for turbine engines, the temperatures used in the climb test prescribed in Section 23.1043(b)(2), be furnished as operating limitations in the Airplane Flight Manual. Proposed Section 23.1583(b) merely makes it clear that any operating limitations that are established under Section 23.1521 must be furnished in the Airplane Flight Manual. In view of the adoption of proposed Section 23.1583(b) as revised, Section 23.1583(j) is deleted and marked "Reserved."

With regard to the proposal to amend Section 25.1583 (Proposal 6-56), one commentator recommended the deletion of proposed paragraph (b)(3) concerning powerplant limitations, and paragraph (i) concerning maneuvering load factors. The commentator stated that if the engine instrument markings have to be changed, it should be handled by a service bulletin. The FAA does not agree. The relation between the powerplant limitations and the instrument markings should be explained in the Manual. The commentator also stated that the load factor (number) is meaningless to the pilot as he cannot determine what it is during a pull-up maneuver. He stated that correlation with bank angle

is acceptable, but that transport aircraft do not exceed 60 degree bank angles. The FAA believes that the maneuvering load factor should be retained in the Flight Manual because it is established as an operating limitation under Section 25.1531, and the correlation with bank angle provides useful information to the pilot concerning the strength limitations of the airplane.

The proposals to amend Sections 23.1583, 25.1583, 27.1583 and 29.1583 are adopted with the revision discussed above.

For consistency in the terminology used in the cooling tests requirements, a nonsubstantive change is being made to Sections 23.1043(a)(1), 23.1043(d), 27.1043(a)(1), 27.1043(d), 29.1043(a)(1), and 29.1043(d) by deleting the words "maximum anticipated air temperature" and inserting in their place the words "maximum ambient atmospheric temperature".

Proposal 6-24. One commentator objected to proposed Section 23.1523, which concerns the establishment of the minimum flight crew, stating that it is not necessary to make all aircraft conform to the requirements of Part 25. The FAA believes that proposed Section 23.1523 specifies the appropriate requirement that should be considered in determining the minimum flight crew for Part 23 airplanes.

Another commentator said that specification of minimum crew is an operational item that may vary with the type of operation, e.g., for compensation or hire which by law must be conducted in accordance with the highest standards. He concluded that rules specifying the number of crew members for specific operations should be in the operating regulations. The FAA agrees that certain rules concerning the number of crew members properly belong in the operating rules, and this is done, for example, in Subpart M of Part 121. However, under current Section 23.1523, the minimum crew is established for VFR only, without requiring consideration of the additional crew duties that arise when IFR operations are authorized. These duties may be imposed by the design and operating characteristics of the aircraft and by its installed equipment. The FAA believes that they must therefore be evaluated during the type-certification process. The proposal to revise Section 23.1523 is adopted without substantive change.

Proposal 6-25. One commentator objected to proposed Section 23.1541 concerning placards in airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6-3. Proposed Section 23.1541 is adopted without substantive change.

Proposal 6-26. One commentator objected to proposed Section 23.1559 concerning placards in airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For a discussion of those comments, see Proposal 6-3. Proposed Section 23.1559 is adopted without substantive change.

Proposal 6-27. Proposed Section 23.1567(b)(2) would require that utility category airplanes that do not meet the spin requirements for acrobatic category airplanes have a placard in clear view of the pilot stating "Spins prohibited." One commentator said that the proposal is redundant and would add to the already confusing proliferation of cockpit placards. The FAA does not agree since the proposal would prevent any possible confusion as to whether a particular utility category airplane has been approved for spins. The proposal is adopted without substantive change.

Proposals 6-28, 2-39, 2-43, and 2-45. Proposed Section 23.1581(a) is revised in accordance with the discussion of the proposal to amend Section 25.1581 (Proposal 6-55). For another comment related to Proposal 6-28, see Proposal 6-3.

Disposition of Proposal 2-39 to add a new Section 23.1353(f) (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-28. For comments related to proposed Section 23.1353(f) and for an explanation of the revision to proposed Section 23.1353(f), see the discussion of Proposal 2-87 under 6-57. Disposition of Proposal 2-45 to revise Section 23.1581(b) and to add a new Section 23.1581(d) (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-28.

One commentator, who agreed in general with proposed Section 23.1581(b), recommended several clarifications. He indicated that the title "Pilot's Operating Handbook" should be allowed as an alternative to "Airplane Flight Manual." The FAA has no objection to the title "Operating Handbook" if the title page also includes a statement indicating that the document is an FAA required Airplane or Rotorcraft Flight Manual.

The commentator also indicated that the FAA should delete any requirement for individual page approval for operating limitations in Handbooks that meet a specification acceptable to the Administrator. Proposed Section 23.1581(b)(1) would require approval of each page containing the prescribed operating limitations whereas current Section 23.1581(b) requires that each part of the Airplane Flight Manual containing information presented in Sections 23.1583 through 23.1589 be approved.

The intent of proposed Sections 23.1581(b)(1) and (b)(2) was to require that the presentation of operating limitations be approved by the FAA and be clearly identified as such while at the same time providing an option for the presentation of the other required information. This option would have provided that each page containing the information prescribed in Sections 23.1585 through 23.1589 had to be determined in accordance with the applicable requirements of this part and had to be approved or the information presented in its entirety in a manner acceptable to the Administrator.

In light of the comments received and after further review, the FAA believes that this intent will be accomplished in a

simpler manner, and will be more consistent with Parts 25, 27, and 29 flight manual requirements, by retaining the current requirements and providing that each part containing operating limitations must be approved and limited to such information, and the information prescribed in Sections 23.1585 through 23.1589 must be determined in accordance with the applicable requirements of this part and presented in a manner acceptable to the Administrator. Proposed Sections 23.1581(b)(1) and (b)(2) are revised to reflect the changes discussed above.

The references in proposed Sections 23.1581(b)(1) and (b)(2) to the information prescribed in Sections 23.1581(c) (paragraph (a)(2) as adopted) have been deleted to be consistent with the flight manual requirements of Parts 25, 27, and 29.

One commentator objected to Proposal 2-45 on the grounds that procedures, performance data, and loading information for any airplane certificated under Part 23 would not have to be approved by the FAA. This comment evidently refers to proposed Section 23.1581(b)(2)(i) (which is incorporated into paragraph (b)(2) as adopted), under which the information prescribed in Sections 23.1585 through 23.1589 would not be identified as FAA-approved, if this information in its entirety is presented in a manner acceptable to the Administrator. The FAA does not agree with the comment. Under the proposal, the information would have to be determined in accordance with the applicable requirements of Part 23. In finding that a manual is acceptable, the FAA would review the manual to determine that the required information is complete and accurate. The manual would also be reviewed to ensure that any additional information provided by the applicant is not in conflict with required information or contrary to the applicable airworthiness requirements. The FAA believes that Section 23.1581(b)(2) will provide an adequate method of review of the information prescribed in Sections 23.1585 through 23.1589.

The proposals to amend Section 23.1581 are adopted with the revisions discussed above.

Disposition of Proposal 2-43 to amend Section 23.1555 (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-28. No unfavorable comments were received on Proposal 2-43, however, proposed Section 23.1555(c)(3) is revised by deleting the words "and in the Airplane Flight Manual" in view of the requirements of Sections 23.1581 and 23.1587(a)(2), as adopted.

Proposal 6-29. For comments related to the proposal to revise Section 23.1583(b), see Proposal 6-23.

Proposal 6-30. One commentator objected to the application of proposed Section 23.1585, concerning operating procedures, to

airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6-3.

The proposal to amend Section 23.1585 is adopted without substantive change.

¢For discussion concerning new Section 23.1585(e), see Proposals 6-57 and 2-87.|

Proposals 6-31 and 2-46. One commentator objected to the application of proposed Section 23.1587, concerning performance information, to airplanes of 6,000 pounds or less maximum weight for reasons stated in his comments on Proposal 6-3 concerning Flight Manuals. For a discussion of these comments, see Proposal 6-3.

Another commentator stated, in response to proposed Section 23.1587(a)(7), which would require information on the steady rate or gradient of climb, that if gradient data are presented, conversion charts should be included, and that ideally each determination should be available; however, he concluded that the option of one or the other should be deleted and a definite requirement adopted. The commentator misinterpreted the proposed requirement. Section 23.65(c), as adopted by this amendment, requires the determination of a gradient of climb for turbine engine powered airplanes. Proposed Section 23.1587(a)(7) is worded so as to take into account the requirement of Section 23.65(c), not to provide an option for the applicant, i.e., whether gradient of climb or rate of climb is furnished under Section 23.1587(a)(7) will be determined by the applicable requirement of Sections 23.65 and 23.77.

Section 23.1587 is adopted as proposed, except that a new Section 23.1587(a)(9) has been added to include information on the maximum ambient temperature at which compliance with the cooling requirements is shown for reciprocating engines. This addition is explained in the discussion of the comments on Proposal 6-23.

Disposition of Proposal 2-46 (Notice 75-10), which proposed to delete the second sentence of present Section 23.1587(a)(2), was deferred so it could be considered with Proposal 6-31. No unfavorable comments were received on Proposal 2-46. Proposal 2-46 was reproposed in Proposal 6-31, and is adopted without substantive change with the adoption of Proposal 6-31.

Proposal 6-32. Proposed new Section 25.21(f) would require that when surface winds must be considered, the wind velocity must be measured at or corrected to a height of 10 meters above the surface, because the National Weather Service is standardizing on a height of 10 meters for reporting winds at airports. One commentator said that since the purpose of the proposal is standardization of Airplane Flight Manual performance information with respect to reported winds for takeoff or landing

in service operations, the requirement should be placed in the flight manual requirements under Section 25.1587(c)(1)(i) instead of in Section 25.21. The FAA agrees that this is one purpose of the proposal but there are flight requirements other than those concerning performance information that require consideration of surface winds. Therefore, the FAA believes that it is more appropriate to include the proposed requirement in Section 25.21. However, proposed Section 25.21(f) is revised to clarify its applicability.

The proposed change to Section 25.21(d), which deals with tolerances for variables in flight testing, would delete the requirement that the tolerance on wind during takeoff and landing tests must be based on the wind measured at a height of 6 feet above the runway. The commentator said that performance analysis is usually based on winds at the height of the mean aerodynamic center of the airplane above the runway surface, and that the data in the Airplane Flight Manual is then corrected to the currently used height of 50 feet. The commentator recommended that this procedure be continued, except that the wind velocities in the Flight Manual should be based on a height of 10 meters instead of 50 feet. The FAA believes that the proposed deletion of the 6-foot height from Section 25.21(d), together with proposed Section 25.21(f), as revised, would allow continued use of the procedure recommended by the applicant.

The commentator also suggested that the correction chart in Civil Aeronautics Manual 4b Appendix A, Figure 2, be considered for inclusion in Part 25. The FAA does not believe that it is necessary to include this information in the rules.

The proposal to amend Section 25.21 is adopted with the revisions discussed above.

Proposal 6-33. For comments related to the proposal to amend Section 25.29, see Proposal 6-5.

Proposal 6-34. Several commentators objected to the method of computing V sub 1 (takeoff decision speed) in proposed Section 25.107(a) on the grounds that - (1) the speed increment between V sub EF (engine failure speed) and V sub 1 should not be determined with all engines operating because the accelerate-stop distance determined under proposed Section 25.109(a) would then be unnecessarily large for the critical engine failure condition (especially for twin-engine airplanes); and (2) placing the 2.0-second time delay between V sub EF and V sub 1 in proposed Section 25.107(a)(2)(ii) does not adequately provide for these instances in which the pilot may have to analyze and react to an event that occurs immediately before reaching V sub 1.

It was recommended that proposed Section 25.107(a) be revised so that V sub 1 is determined by adding to V sub EF the speed gained with the critical engine inoperative during the time interval between the instant at which the critical engine is failed and the instant at which the test pilot recognizes and

reacts to the engine failure, as indicated by the pilot's application of the first retarding means during accelerate-stop tests (the 2.0-second minimum time delay that was proposed to be included between V sub EF and V sub 1 would be deleted). It was further recommended that proposed Section 25.109(a) be revised so that a 2.0-second time delay following V sub 1 is incorporated into the determination of accelerate-stop distances, as follows: (1) for the engine failure case, the acceleration of the airplane from V sub EF would be with the critical engine inoperative and would continue for 2.0 seconds after reaching V sub 1; and (2) for the other event case, the acceleration of the airplane would be with all engines operating and would continue for 2.0 seconds after reaching V sub 1.

After considering all of the comments on these proposals and after further review, the FAA agrees with these comments and the recommendations. The FAA believes that the recommended revisions would provide for events other than engine failure, even though the speed increment between V sub EF and V sub 1 would be determined with the critical engine inoperative instead of all engines operating, because the accelerate-stop distance for the other event case would be determined with all engines operating from the start of takeoff until 2.0 seconds after V sub 1 is reached. Further, the FAA believes that deleting the 2.0 second minimum time delay from the determination of V sub 1 and inserting a 2.0-second delay after V sub 1 in the determination of the accelerate-stop distance would be more appropriate for most rejected takeoff situations, since stopping requires a positive decision and action by the pilot. Proposed Sections 25.107(a) and 25.109(a) are revised accordingly.

Several commentators objected to the 2.0-second (minimum) time delay used in computing V sub 1 under proposed Section 25.107(a)(2)(ii) on the grounds that it would increase the required take-off runway lengths, particularly in the engine failure case, and that such increases are not justified. One commentator recommended that the time delay be reduced to 1.0 second. The revisions discussed above significantly reduce the effect of the 2.0-second time delay on the required accelerate-stop distance in the engine failure case. Under Section 25.107(a) as proposed, the airplane would be accelerated to a V sub 1 speed equal to V sub EF (engine failure speed) plus the speed gained with all engines operating during a total time interval of about 3 seconds (i.e., during the time required for the test pilot to recognize and react to an engine failure in accelerate-stop tests, plus a 2.0-second time delay for service operations). Under proposed Section 25.109(a), the accelerate-stop distance for the engine failure case would be determined by accelerating the airplane from V sub EF to the V sub 1 speed determined under proposed Section 25.107(a), but with the critical engine inoperative instead of with all engines operating. As pointed out by one of the commentators, the total time interval between engine failure and application of the first retarding means could then become about 6 seconds for a twin-engine airplane in the engine failure case, and the distance

traversed during the additional 3 seconds (beyond the time interval prescribed in Section 25.107(a)) would be included in the accelerate-stop distance. However, under the revisions incorporated in Sections 25.107(a) and 25.109(a) as adopted, the revised V sub 1 speed is equal to V sub EF plus the speed gained with the critical engine inoperative during the test pilot's recognition-reaction time interval with no further time delay. The accelerate-stop distance for the engine failure case is then determined by accelerating the airplane with one engine inoperative from V sub EF to the revised V sub 1 speed and then for an additional 2.0 seconds, before the first retarding means is applied. Under these revisions, a 2.0-second allowance for time delays in service operation is retained, but the total time interval between V sub EF and application of the first retarding means in the engine failure case would be significantly reduced (for example the reduction could be from about 6 seconds to about 3 seconds for a twin engine airplane). The accelerate-stop distance for the engine failure case would be reduced accordingly. The FAA does not believe that any further revision is warranted because the 2.0-second delay (incorporated into Section 25.109 as adopted rather than Section 25.107) is necessary to allow for a surprise element and other operational factors not covered in accelerate-stop tests.

One commentator proposed that V sub 1 speeds be established as recognition speeds for both engine failure and other event cases. However, it is not clear how a recognition time for "other events" would be determined since there is a large variety of possible events that could lead to a rejected takeoff.

Another commentator, in addition to suggesting changes similar to those already made as discussed above, recommended that V sub 1 be established as a failure recognition speed which would be determined by adding to the speed at which the initial failure is assumed to occur, the time between the failure and the pilot's recognition of the failure (assumed to be 2.0 seconds before his reaction to the failure), and the time not less than 2.0 seconds, to allow for time delays in service under reasonably unfavorable operating conditions. The FAA does not agree that there should be a 2.0-second minimum delay, regardless of the pilot's actual reaction time, in determining V sub 1 under Section 25.107(a), because proposed Section 25.109(a) as revised will require that the accelerate-stop distance computations include acceleration of the airplane for 2.0 seconds after V sub 1 is reached.

This commentator further proposed that closing of the throttles be specified in proposed Section 25.109 as the first action to be taken in stopping the airplane, with subsequent actions at intervals of not less than one second. Currently Section 25.101(h) already requires that the procedures used in determining the accelerate-stop distance must be able to be consistently executed in service by crews of average skill, and must include allowance for any time delays in the execution of the procedures that may be reasonably expected in service. The

order in which the retarding devices are applied and the subsequent time delays will be established during type certification under the general provisions of Section 25.101(h).

One commentator objected to the requirement in proposed Section 25.107(a) that V sub EF may not be less than V sub MCG (minimum control speed on the ground) determined under (proposed) Section 25.149(e). The commentator stated that it should only be required that V sub 1 not be less than V sub MCG because if an engine failure is recognized between V sub EF and V sub 1 the takeoff should be aborted. However, under proposed Sections 25.107(a) and 25.109(a), as revised V sub 1 will be placed at the speed at which the test pilot recognizes and reacts to an engine failure during accelerate-stop tests and the 2.0-second time delay will be inserted after V sub 1 instead of between V sub EF and V sub 1 as proposed. The revision allows V sub 1 to be very close to V sub EF. Therefore, the effect on takeoff and accelerate-stop distance of requiring that V sub EF not be less than V sub MCG has been significantly reduced because of the deletion of the minimum 2.0-second delay between V sub EF and V sub 1. In addition, the FAA believes that V sub EF should not be less than V sub MCG so that there will be at least a small margin between V sub MCG and V sub 1 to ensure controllability of the airplane at V sub 1.

One commentator recommended that the proposals containing V sub 1 and accelerate-stop distances be made retroactive to existing transport category airplanes one year after the date of their adoption. Current Section 25.101(h) already provides that the procedures used in determining accelerate-stop distance include allowance for time delays reasonably expected in service. The purpose of the present proposals is to clarify and standardize the method of including an appropriate time delay in the accelerate-stop performance determination for airplanes type certificated in the future.

In regard to proposal 6-2, which would change the definition of V sub 1 in Section 1.2 from "critical engine failure speed" to "takeoff decision speed," one commentator considered the proposed definition to be inadequate because "decision" is an undefined quantity. The commentator recommended that the proposal be revised to state that V sub 1 means the speed at which the flight crew has recognized an engine failure or other event and takes action either to reject or continue the takeoff. The significance of V sub 1 with respect to accelerate-stop distance, takeoff distance, and the related operating procedures is explained in the Airplane Flight Manual and the FAA believes it is too complex to be completely described in a brief definition in Section 1.2. Accordingly, the proposed amendment of Section 1.2 is adopted without substantive change.

The proposals to revise Sections 25.107(a) and 25.109(a) are adopted with the revisions discussed above.

Proposal 6-35. One commentator stated that if the intent of

proposed Sections 25.107(d) and (e)(1)(iv) with respect to the engine-out V sub mu is to ensure controllability, the (V sub R)-5 tests required by Section 25.107(e)(3) should be expanded to require the test over the full range of certification conditions and all references to one-engine-inoperative V sub mu should be deleted from Sections 25.107(d) and (e). The FAA does not agree with this recommendation because it would ignore the performance aspects (thrust-to-weight ratio) of the one-engine-inoperative V sub mu demonstration.

Another commentator stated that flight test experience has shown that trim and control drag is accounted for with the thrust/weight ratio corresponding to the one-engine-inoperative condition used in the test, and that actual engine-out V sub mu tests result in the same V sub mu as tests conducted at the simulated engine-out thrust-to-weight ratio. The FAA agrees, and the last sentence of proposed Section 25.107(e)(iv) is deleted. The proposal to amend Section 25.107 is adopted with the revision discussed above.

Proposal 6-36. For comments related to proposed Section 25.109(a), see Proposal 6-34.

Proposal 6-37. One commentator agreed with the proposed change to Section 25.111(a)(2), which would delete the reference to V sub 1 and substitute V sub EF in its place to make Section 25.111(a) consistent with proposed Section 25.107(a) (Proposal 6-34). However, this commentator did not agree with making the same change to Section 25.111(a)(3), and said that the present reference to V sub 1 in that paragraph is correct for the new definition of V sub 1 (i.e., as defined in proposed Sections 1.2 and 25.107(a)). The FAA does not agree with the comment on proposed Section 25.111(a)(3) because it would leave a gap in the requirements for the speed range between V sub EF and V sub 1.

Accordingly, the proposal to amend Sections 25.111(a)(2) and (a)(3) is adopted without substantive change.

Proposal 6-38. Proposed Section 25.121(e) would require the determination of the vertical distance required to make a transition from a 3-degree descent path in the landing configuration with the critical engine inoperative to a stabilized climb condition. Several commentators stated that the vertical distance determined in this manner should not be considered a minimum decision height for approaches. The FAA agrees, since the establishment of decision height requires consideration of many operational factors. Some commentators stated that the landing configuration in the proposal is not appropriate for one-engine-inoperative approaches. One commentator recommended that the horizontal as well as the vertical distance for transition to approach climb be determined, and referred to the work of the ICAO Obstacle Clearance Panel on this subject. Another commentator recommended that the required determination take into account the minimum control speed, V sub MC. In light of the comments received, and after further review,

the FAA believes that proposal 6-38 should be withdrawn.

Proposal 6-39. Several commentators objected to the proposal to amend Section 25.123(a) on the ground that current Section 25.123(a) is conservative and has the advantage of greater simplicity. The FAA agrees and the proposal to amend Section 25.123(a) is therefore withdrawn.

Proposal 6-40. One commentator recommended that proposed Section 25.143(b) be withdrawn and that current Section 25.143(b) be retained on the ground that there are areas within the flight envelope from takeoff to landing where the failure of a second engine cannot be handled smoothly and safely. The commentator also stated that the proposed amendment is vague and could produce confusion with respect to time between failures, and that it could be interpreted to require a combination of double engine failure and configuration changes. The FAA agrees that the proposed rule requires some clarification, but does not believe that the current Section 25.143(b) should be retained. With respect to failure of a second engine on airplanes with three or more engines, the FAA believes that failure of a second engine can be reasonably expected in the enroute, approach, and landing stages of flight after failure of one engine earlier in the flight.

Therefore, proposed Section 25.143(b) is revised to require consideration of the sudden failure of the second critical engine when the airplane is in a trimmed condition with one engine inoperative in the enroute, approach, and landing configurations. This revision also clarifies the requirement with respect to time between engine failures by providing that the airplane is in a trimmed condition with one engine inoperative when the second engine is failed. In regard to combination of engine failure and configuration changes, it should be noted that the introductory sentence of proposed Section 25.143(b) refers to "probable operating conditions," and that some change of configuration may be desirable after engine failure, e.g., retracting the landing gear for a go-around after engine failure in the landing configuration.

Another commentator considered the proposed configuration change requirement to be too general and vague and suggested that the proposed requirement contain certain specific criteria. The commentator also recommended that interpretative material be included in the rule or in the associated Flight Test Guide. The FAA does not agree. The FAA believes that the wording of the proposed rule is clear and would accomplish the intended purpose.

The proposal to amend Section 25.143(b) is adopted with the revision discussed above.

No unfavorable comments were received on the proposal to amend Section 25.143(c), which would reduce the maximum allowable rudder force for temporary application in meeting the controllability requirements, from 180 pounds to 150 pounds.

Accordingly, the proposal is adopted without substantive change. For consistency with Section 25.143(c), as adopted, and since flight test experience has shown that 180 pounds may make control difficult for some pilots under some flight conditions, Section 25.147(a) is amended by deleting the reference to "180 pounds" and inserting in its place "150 pounds".

Proposal 6-41. One commentator recommended deletion of proposed Section 25.149(a), which would require that the method used to simulate critical engine failure must represent the modes of powerplant failure expected in service. The FAA does not agree. This provision is necessary to ensure that the most adverse condition with respect to controllability is considered. To clarify this intent, Section 25.149(a) is revised to require consideration of the most critical mode of powerplant failure with respect to controllability expected in service. This commentator objected specifically to dynamic engine cut demonstrations because of the hazards involved. The FAA believes that dynamic effects should be considered during type certification, since they might occur in service operations.

Upon further review, the FAA believes that specific guidance as to the setting of the propeller on propeller-driven airplanes is necessary with regard to proposed Section 25.149(c). Current Section 25.149(b)(8) specifies the setting of the propeller for reciprocating engine-powered airplanes. Current Section 25.149(c)(5) specifies that for turbine engine-powered airplanes, the airplane must be "... in the most critical takeoff configuration existing along the flight path ..." and has been administered to require that the setting of the propeller of turbine engine-powered, propeller-driven airplanes be the same as that specified in current Section 25.149(b)(8). Accordingly, current Section 25.149(b)(8) is retained and redesignated Section 25.149(c)(7), to be applicable to all propeller-driven airplanes.

One commentator stated that the pilot should be provided with information regarding the effects of bank angle on V sub MC. The FAA does not have enough information at this time to justify the suggested requirement.

Proposed 25.149(e) would require the determination of a minimum control speed on the ground, V sub MCG, for use in establishing takeoff speeds under proposed Section 25.107 (see Proposal 6-34). One commentator recommended that the second sentence of proposed Section 25.149(e) be revised to read "During this demonstration, the permissible lateral deviation of the path of the airplane would be limited to 30 feet." He said that the revision would eliminate the possibility of misinterpretation. The FAA believes that the language of the proposal is clear; however, it may be too restrictive in requiring the ground track to be parallel to or converging toward the centerline of the runway when the airplane is rotated for takeoff, and thereby unnecessarily delay rotation in determining takeoff performance under Sections 25.107(e) and 25.111. Section 25.149(e) is therefore revised to state that the airplane's path, from the

point at which the critical engine is made inoperative to the point at which recovery to a direction parallel to the runway centerline is completed, may not deviate more than 30 feet laterally from the centerline. The adopted rule would allow the airplane to be rotated for takeoff before recovery to a direction parallel to the runway centerline is completed; however, it should be noted that it requires that V sub MCG must be determined to enable the takeoff to be safely continued using normal piloting skill. The commentator also recommended that proposed Sections 25.149(e)(3) and (e)(5) be deleted because flight tests have proven that gross weight and center of gravity have no effect on V sub MCG. The FAA does not agree. The airplane's acceleration varies with its weight, and this may affect directional control on the ground.

One commentator stated that proposed Section 25.149(e) would allow a lateral deviation of 30 feet during the determination of V sub MCG, whereas the current FAA Flight Test Handbook recommends 25 feet and the Air Force requires 25 feet. The commentator recommended that 25 feet be specified in the adopted rule. The FAA believes that the 30-foot deviation limit will assist in international standardization in this area. In addition it should be noted that Section 25.107(a)(1) as adopted (see discussion of Proposal 6-34) requires V sub EF to be not less than V sub 1 to be greater than V sub EF, thus providing a small controllability margin at V sub 1.

Several commentators recommended that the proposal be revised to allow the use of nose wheel steering in the determination of V sub MCG under Section 25.149(e), if control is through the rudder pedals and the demonstration is made on a wet runway. The FAA does not agree. The effectiveness of nose wheel steering depends to a large degree on runway friction characteristics and the load on the nose wheel. Certification tests on a wet runway would not cover the more extreme slippery runway conditions or all possible variations in takeoff conditions and techniques likely to occur in service. The FAA therefore believes that V sub MCG should be determined without the use of nose wheel steering, as stated in proposed Section 25.149(e).

In regard to the airplane configuration used in determining V sub MCG, one commentator recommended that proposed Section 25.149(e)(1) be revised to specify each takeoff configuration instead of the most critical takeoff configuration, to allow a separate V sub MCG for different flap settings. The FAA agrees that an applicant should be allowed to determine a separate V sub MCG for different takeoff configurations but believes that the applicant should also have the option of determining a V sub MCG value for only the most critical takeoff configuration. Proposed Section 25.149(e)(1) is revised accordingly.

Proposed 25.149(e)(2) would require that V sub MCG be determined with maximum permissible takeoff power or thrust on the operating engines; however, the word "permissible," in

relation to power or thrust, is not defined or used elsewhere in the performance and flight characteristics requirements. For consistency with Sections 25.101(c) and 25.149(c)(1), the word "permissible" is replaced by "available" in Section 25.149(e)(2) as adopted. It should be noted that Section 25.101(c) refers to the propulsive thrust available under the particular flight condition and thus provides for any difference between the takeoff thrust set during takeoff and the thrust available in flight for a go-around.

Proposed Sections 25.149(f), (g), and (h) would require the determination of two new minimum control speeds, V sub MCL and V sub MCL-2, associated with an engine failure during landing approaches that are initiated with all engines operating and with one engine inoperative, respectively. One commentator said that these proposals are inconsistent with the V sub MCL definitions being considered in the development of wet runway landing performance rules. The commentator recommended that these proposals be deleted until an acceptable rational landing rule is established. Another commentator stated that V sub MCL and V sub MCL-2 would serve no useful purpose and may confuse flight crews. The FAA does not agree with these comments. These proposals are intended to cover the controllability aspects of an engine failure during landing approach. Proposed Section 25.149(f) as revised is intended to determine a minimum control speed for the situation where an engine fails after power or thrust has been increased to make a go-around from an approach with all engines operating. For airplanes with three or more engines, proposed Sections 25.149(g) and (h) as revised are intended to determine a minimum speed for maintaining safe control during the power or thrust changes that are likely to be made following the failure of a second engine during an approach initiated with one engine inoperative. The FAA believes that these proposals, with revisions discussed, should be adopted at this time to provide information for use in pilot training and service operations.

One commentator noted that proposed Sections 25.149(f)(5), (g)(5), and (h)(2) specify "maximum permissible power" in the determination of V sub MCL and V sub MCL-2. The commentator recommended that this be changed to "takeoff or maximum permissible power" as used in present Section 25.149. Another commentator said that it is not clear whether "maximum permissible thrust" in proposed Sections 25.149(f), (g), and (h) means maximum takeoff (or contingency) thrust, or whether a lower thrust can be scheduled. This commentator also stated that takeoff (or contingency) thrust would represent an increase in severity with respect to both the British Civil Air Regulations and present Section 25.149(d), and that the thrust to be associated with recovering control following a sudden engine failure in Sections 25.149(f) and (g) should be the power required for a 3-degree approach, and the thrust range to be associated with maintaining straight flight thereafter should be from minimum power to power for level flight or maximum power, whichever occurs first.

As explained in the preceding discussion of Section 25.149(e)(2), current Section 25.149(c)(1) uses the words "maximum available takeoff power or thrust". The FAA believes that, for V sub MCL, the power or thrust condition at the time of engine failure should be the thrust associated with a go-around and therefore believes that maximum available takeoff power or thrust should be prescribed in Section 25.149(f) since the approach climb requirements in Section 25.121(d) allow use of available takeoff power or thrust. Proposed Section 25.149(f) is revised accordingly.

However, since there are no performance requirements for a go-around with two engines inoperative, the FAA believes that the initial power condition at the time of failure of the second engine in Section 25.149(g) for V sub MCL-2 should be that for a 3-degree approach with one engine inoperative. This is one of the initial power conditions prescribed in proposed Section 25.149(h). In regard to the maximum power or thrust to be applied after the second engine is made inoperative, the FAA believes that the value of V sub MCL-2 to be furnished as information to the pilot should be based on the power or thrust that provides the maximum performance capability of the airplane without exceeding the powerplant limitations, i.e., maximum available takeoff power or thrust at the upper end of the range, and minimum available power or thrust at the lower end of the range. Proposed Section 25.149(g) is revised accordingly.

Since V sub MCL will be determined with maximum available takeoff power, proposed Section 25.149(h) is revised so that the requirement of changing the power or the operating engines after failure of the critical engine only applies to V sub MCL-2.

One commentator said that the critical weight for V sub MCL can be the lowest weight, when a 5-degree bank angle is used, and he therefore recommended that proposed Sections 25.149(f)(4) and (g)(4) be revised to specify the most unfavorable weight in the range of landing weights, instead of the maximum sea level landing weight (or any lesser weights necessary to show V sub MCL). The FAA agrees that light weight may be critical for V sub MCL or V sub MCL-2 but does not believe that the recommended wording change is necessary. The proposal is consistent with current Section 25.149(c)(4), and light weight conditions are considered under the current rule.

One commentator stated that the proposal requires determination of V sub MCL and V sub MCL-2 but does not appear to require that this information be made available to flight crews or that it be used in determining the approach speed. The commentator recommended that the proposal be changed to require that V sub MCL and V sub MCL-2 be included in the Airplane Flight Manual and also that the landing performance requirements in Section 25.125 be amended to take account of V sub MCL. The FAA does not have sufficient information to justify changing the landing performance requirements in the manner recommended by the

commentator. However, information regarding V sub MCL and V sub MCL-2 would be required to be furnished in the Airplane Flight Manual pursuant to the provisions of Section 25.1585(a)(1).

For a comment related to the clause "either with zero yaw or with an angle of bank of not more than 5 degrees", which is contained in proposed Sections 25.149(e), 25.149(f), and 25.149(g), see Proposal 6-13.

The proposal to amend Section 25.149 is adopted with the revisions discussed above.

Proposal 6-42. One commentator stated that the exception in proposed Section 25.177(b)(2) for the speed range from (V sub MO)/(M sub MO) to (V sub FC)/(M sub FC) should also be applicable to the speed range from 1.2 V sub S1 to (V sub MO)/(M sub MO). The FAA does not agree. (V sub MO)/(M sub MO) is the maximum operating limit speed. Gradual divergence that is easily recognizable and controllable by the pilot is allowed in the speed range above (V sub MO)/(M sub MO) because it is expected that operation at speeds above (V sub MO)/(M sub MO) will occur only for brief periods and that flight control demands will in general be limited to the restoration of flight at speeds below (V sub MO)/(M sub MO).

Accordingly, the proposal to revise Section 25.177(b) is adopted as proposed except that a provision for maximum flap extended speed and maximum landing gear extended speed has been added for clarification and consistency with the present rule.

Proposal 6-43. Proposed Section 25.181(b) would require that combined lateral-directional ("Dutch roll") oscillations be positively damped, i.e., diminish after a disturbance, but it does not specify the degree of damping. One commentator recommended that the proposal be revised to state that lateral-directional oscillations should be damped but that neutral damping or mild divergence would be acceptable if it is easily controllable by the pilot. The commentator said the proposal is unnecessarily restrictive following the failure of a stability augmentation device, since the device must be designed to meet Section 25.21(e), and that the damping required should be related to the frequency and amplitude of the oscillation, the pilot tasks, and environmental effects. The commentator also said that, if unsatisfactory damping following a failure is confined to an avoidable flight area or configuration and is controllable to return the aircraft to a satisfactory condition for safe flight, the lack of appreciable positive damping may be acceptable. The FAA does not agree with this recommendation. Current Section 25.181 requires any short period oscillation to be heavily damped, and the proposal would require that combined lateral-directional oscillations be positively damped instead of heavily damped. The change recommended by the commentator would increase the pilot's tasks and could result in an unsafe

situation when operating in rough air. Section 25.672(c) already allows degradation of stability and other flight characteristics after any single failure in a stability augmentation system if the airplane is safely controllable and the resulting stability characteristics allow continued safe flight and landing.

Another commentator recommended that the proposal should be changed to raise the lower limit of the speed range for positive stability from the stalling speed to 1.2 V sub S1. The proposal is the same as the current rule with respect to the lower speed limit of the speed range for positive stability and the FAA does not have sufficient information at the present time to justify raising the lower speed limit to 1.2 V sub S1.

The proposal to revise Section 25.181 is adopted without substantive change.

Proposal 6-44. One commentator recommended that the proposal to amend Section 25.201 and the proposal to amend Section 25.207 (Proposal 6-45) be withdrawn in light of current FAA studies on landing distances which may result in a new stall requirement. The FAA does not agree with this recommendation because the proposals for Sections 25.201 and 25.207 deal with stall demonstration and stall warning, and current studies for the landing distance rules do not include changes to Sections 25.201 and 25.207.

Another commentator stated that many modern airplanes are accepted as having correct stalling characteristics even though these occur before reaching the angle of attack for maximum lift, and suggested that the phrase "at an angle of attack measurably greater than that for maximum lift" be deleted from proposed Section 25.201(d)(1). Proposed Section 25.201(d)(2) sets forth an exception to the requirement in current Section 25.201(c)(2) with respect to those instances in which the airplane may be considered to be stalled). The FAA does not believe any further relaxation would be justified.

One commentator expressed concern that proposed Section 25.201 might result in unwarranted increases in operational speeds and runway length requirements; however, no explanation of this comment was provided. Some operating speeds are affected by stalling speeds which are determined under Sections 25.103, 25.203, and 25.201. Proposed Section 25.201(d)(2) provides that for an airplane demonstrating an unmistakable inherent aerodynamic warning in a particular configuration of a magnitude and severity that is a strong and effective deterrent to further speed reduction, the airplane may be considered stalled when it reaches the speed at which the effective deterrent is clearly manifested. (This exception is present in the current rule but is only applicable to those airplanes demonstrating the required degree of warning in all required configurations.) The FAA believes that it is necessary that an applicant be allowed to limit the stall demonstration to the speed where a strong and effective deterrent (such as severe buffeting) is clearly

manifested because operation of the airplane at any lower airspeed may be hazardous. Therefore, the FAA believes that any increase in an operating airspeed because a stall demonstration was limited to the airspeed at which there exists an effective deterrent, as provided in proposed Section 25.201(d)(2), is justified.

Accordingly, the proposal to amend Section 25.201 is adopted as proposed, except that a nonsubstantive change is made to proposed Section 25.201(d)(2) to clarify its intent. The proposal to amend Section 25.207 is adopted without substantive change.

Proposal 6-45. For comments related to the proposal to amend Section 25.207, see Proposal 6-44.

Proposal 6-46. Proposed Section 25.233(a) would change the requirements concerning ground looping tendency in cross winds by substituting "25 knots" in place of "0.2 V sub S0" for the prescribed wind velocity. Several commentators objected to the use of 25 knots for the required wind velocity, stating that the present requirement corresponds to about 20 knots for most airplanes, and that standardizing on a height of 10 meters above the surface for airport wind velocities (see Proposal 6-32 for Section 25.21(f)) would also increase the required cross wind component (as compared with the present practice of correcting wind velocity to a height of 50 feet). The FAA agrees that 20 knots would be an appropriate minimum value for the cross wind component; however, this would be less severe than the present rule for airplanes with a stalling speed (V sub S0) greater than 100 knots. Therefore, Section 25.233(a) is revised to replace "0.2 V sub S" with 20 knots or 0.2 V sub S0, whichever is greater, except that the wind velocity need not exceed 25 knots".

One commentator suggested that the rule be written to allow the use of analysis to show acceptable ground handling characteristics for cross wind components greater than 20 knots. The FAA does not agree that analytic methods are reliable for this purpose. (See discussion of Proposal 6-47.)

Proposal 6-47. Proposed Section 25.237(a)(1) would establish 25 knots as the minimum cross wind component for landplanes, to be demonstrated on dry runways. Several commentators objected to the use of 25 knots for the required minimum wind velocity. For reasons explained in the discussion of Proposal 6-46, proposed Sections 25.237(a) and (b) are revised, consistent with Section 25.233 as adopted, by replacing "25.237 knots" with "20 knots or 0.2 V sub SO, whichever is greater, except that it need not exceed 25 knots."

Proposed Section 25.237(a)(2) would require that a safe cross wind component be established for wet runways, but would allow this to be determined by analysis in lieu of demonstration. Two commentators recommended that the proposal concerning wet runways be deleted, since there is no definition of "wet," and

they considered the current rules for cross wind operation to be adequate for either wet or dry cases. Two other commentators doubted the validity of analytic methods for establishing a safe cross wind component for wet runways. In light of the comments received, and after further review, the FAA believes that proposed Section 25.237(a)(2) is premature and it is withdrawn.

Proposal 6-48. Two commentators recommended that proposed Section 25.251(e) be revised to prescribe an acceleration of + or - 0.1 g, instead of + or - 0.05 g, in defining the onset of buffet. One of the commentators stated that this change would ensure a level of buffet that would be distinguishable under turbulent air conditions. The commentator stated that contrary to the explanation in the notice, test pilots have signified the onset of buffet when the buffet level at a flight station was greater than + or - 0.1 g, and that defining buffet onset in Section 25.251(e) as + or - 0.05 g would unnecessarily limit the altitude-payload capability of the airplane. After considering the comments received, and after further review, the FAA does not believe it has enough information at this time to specify an acceleration value for the onset of perceptible buffeting which would be applicable to all airplanes. Accordingly, the proposal is withdrawn.

Proposal 6-49. Proposed new Section 25.255 would establish requirements for maneuvering and dive recovery characteristics with the airplane out of trim by the amount resulting from a three-second movement of the primary longitudinal trim system at its normal rate with no aerodynamic load, or the maximum mistrim that can be sustained by the autopilot while maintaining level flight in the high speed cruising condition, whichever is greater. One commentator said that the requirement would appear not to apply to a manual trim system, and that this should be made clear. The intent of the proposal is to provide a basic maneuvering stability and dive recovery requirement regardless of the type of trim system used in the airplane.

To make this intent clear, the first sentence of the lead-in of proposed Section 25.255 is revised by inserting the parenthetic "(or an equivalent degree of trim for airplanes that do not have a power operated trim system)". In addition, current Section 25.655(b) requires that if an adjustable stabilizer is used, it must have stops that will limit the range of travel to the maximum for which the airplane is shown to meet the trim requirements of Section 25.161. Therefore, the first sentence of the lead-in of proposed Section 25.255 is also revised by inserting an exception indicating that the trim movement need not exceed the range established by stops in the trim system, including those required by Section 25.655(b) for adjustable stabilizers. It should be noted that the word "primary" in the first sentence of the lead-in of proposed Section 25.255 is being deleted since its usage in this context is inappropriate. The same commentator also said that he does not understand the phrase relating to the autopilot, but believes there is a need for an analysis to show whether greater mistrim can result from

autopilot or other system malfunction, or from normal autopilot functioning such as when flying on altitude hold through updrafts. The phrase in the proposal relating to autopilots is intended to provide for circumstances in which the trim system is actuated, either by a runaway or by the pilot, while the autopilot is engaged, and the autopilot is then disengaged when the degree of mistrim reaches the point where the autopilot can no longer hold level flight. The FAA believes that this is an appropriate test criterion. In addition, it should be noted that autopilot malfunctions are covered under Section 25.1329.

One commentator recommended that the proposed wording "at its normal rate with no aerodynamic load" in the lead-in of proposed Section 25.255 be replaced by "at the rate existing for the specified flight condition." The FAA agrees that where the trim system is designed to vary the rate of trim movement according to the flight condition (e.g., as a function of the dynamic pressure), this variation may be taken into account; however, the effects of aerodynamic loads on trim movement may vary in a complex manner, e.g., with center of gravity, airspeed, and system friction. As stated in the notice, the proposal is intended to simulate a typical out-of-trim condition. The FAA believes that the requirement should be specified so that the required trim change can be determined by a relatively simple and uniform procedure. Accordingly, Section 25.255 as adopted is revised to specify a three-second movement of the trim system at the normal rate for the particular flight condition with no aerodynamic load.

One commentator recommended that Section 25.255(a) be changed to read: "The slope of the stick force vs. g (curve) for load factors between -1g and +2.5g must be positive at speeds up to (V sub FC)/(M sub FC) or aural warning (speed) except that a "flattening" of the stick force gradient or a reduction in stick force is permissible if it does not result in the tendency to overcontrol. Lesser acceleration values may be used at altitudes where buffet envelopes are established in accordance with Section 25.251(e)." The FAA disagrees with the recommendation. Current Section 25.253(b) already allows M sub FC to be the same as the Mach number at which effective speed warning occurs for altitudes where Mach number is the limiting factor. At lower altitudes where airspeed is the limiting factor, V sub FC under Section 25.253(b) must be higher than the aural warning speed under Section 25.1303(c)(1). Recoveries from severe upsets or evasive maneuvers are likely to be made in this altitude range at speeds above the aural warning speed. Therefore, the FAA believes that the proposed requirement should be met at speeds up to (V sub FC)/(M sub FC). In addition, to minimize the possibility of over-control and over-stressing the airplane structure, the FAA believes that a reduction in stick force (negative slope of the stick force per g curve) should not be allowed at speeds up to (V sub FC)/(M sub FC). However, it should be noted that flattening of the stick force gradient would be allowed under the proposal as long as the slope is positive.

The changes to proposed Section 25.255(a) recommended by this commentator include deleting the proposed requirement for the speed range between (V sub FC)/(M sub FC) and (V sub DF)/(M sub DF) (the demonstrated flight dive speed). For this speed range, the proposal states that there may not be reversal of the primary longitudinal control force. Speeds above (V sub FC)/(M sub FC) have been reached during recovery from upsets in severe turbulence. The FAA believes that reversal of the direction of the control force (as shown on the stick force per g diagram) should not be allowed at speeds up to (V sub DF/(M sub DF), because force reversal on the primary control could be confusing to the pilots and contribute to hazardous over-control in severe turbulence.

Proposed Section 25.255(a) provides that acceleration values less than those prescribed may be used at altitudes and speeds where buffet envelopes are established in accordance with Section 25.251(e). One commentator objected to this provision and suggested that the proposal be revised to state that, at speeds up to (V sub FC/(M sub FC), the stick force curve must have a positive slope, and at speeds up to (V sub DF/M sub DF) there may not be a reversal of the primary longitudinal control force for normal acceleration values between -1 g and the lesser of 2.5 g and a normal acceleration corresponding, in the particular circumstances of weight, altitude, and air speed or Mach number, to buffeting or other phenomena, of such intensity as to be a strong deterrent to further application of primary longitudinal control force. The FAA does not believe that the buffeting criteria suggested by the commentator would be appropriate, since severe buffeting could mask the normal stick force gradient characteristics.

Another commentator suggested that the proposal be revised to state that "where buffet envelopes are established in accordance with Section 25.251(e), the corresponding lesser acceleration values may be used." The FAA disagrees with the recommendation. The suggested wording would indicate that the requirement for positive maneuvering stability (stick force per g) is limited to the load factors within the buffet onset envelopes (i.e., perceptible buffeting) determined under Section 25.251(e). However, Section 25.251(e) also requires that probable inadvertent excursions beyond the boundaries of the buffet onset envelopes may not result in unsafe conditions. The FAA believes that positive maneuvering stability should be required for inadvertent excursions beyond the buffet onset boundaries, since a pilot is likely to exceed these boundaries in recovering from an upset.

Accordingly, Section 25.255 is clarified by deleting the specific acceleration (g) values and exception clause in paragraph (a), and by setting forth a revised exception clause in a paragraph (e) which states that the accelerations need not exceed the maneuvering load factors associated with probable inadvertent excursions beyond the boundaries of the buffet onset envelopes determined under Section 25.251(e). For consistency

with the structural strength requirements, Section 25.255(e) as adopted also states that the accelerations need not exceed the limit maneuvering load factors prescribed in Sections 25.333(b) and 25.337.

In addition, the other paragraphs of proposed Section 25.255 have been restructured and redesignated for clarity. The second sentence of proposed Section 25.255(d) would provide for the use of longitudinal trim to assist in producing the required 1.5 g for recovery. One commentator suggested that a clause be inserted to require that it be possible to produce at least 1.2 g without use of the longitudinal trim system and without exceeding a longitudinal control force of 125 lbs. The FAA believes that the recommended change is unnecessary because proposed Section 25.255(d) already provides that longitudinal trim can only be used to assist in producing 1.5 g if it meets certain requirements.

Proposed Section 25.255(d) requires that if the longitudinal trim is used to assist in the dive recovery, it must be shown that the trim can be actuated in the nose up direction with the primary surface (e.g., elevators) loaded to produce the least of the nose up control forces specified in paragraphs (d)(1), (d)(2), and (d)(3). One commentator recommended that proposed paragraph (d)(1) be deleted and that paragraph (d)(2) be changed to "125 pounds." The FAA does not agree. In an upset, the initial attempt at recovery is likely to be made with the primary pitch control, and on some airplane designs the airloads on the horizontal tail surfaces tend to prevent movement of the trim system at high speeds. The change recommended by the commentator assumes, in effect, that the pilots will actuate the trim in time to obtain recovery before they apply more than 125 pounds on the primary control. This may not be a valid assumption in extreme upset conditions.

One commentator stated that it is impracticable to demonstrate 1.5 g, and less than 1 g, at (V sub DF)/(M sub DF) in a flight test without exceeding (V sub DF)/(M sub DF), and that some alleviation should be provided to cover this. Proposed Section 25.255(d), which states that it must be possible from an overspeed condition at (V sub DF)/(M sub DF) to produce at least 1.5 g for recovery by applying not more than 125 pounds of control force, would only require that the test be started at (V sub DF)/(M sub DF). With regard to accelerations less than 1 g, the commentator has apparently misinterpreted the requirement of proposed Section 25.255(f). The intent of the requirement in proposed Section 25.255(f) is that the entry speeds for flight test investigations at acceleration values less than 1 g should be limited to the extent necessary to accomplish a recovery without exceeding (V sub DF)/(M sub DF). To clarify this intent, proposed Section 25.255(f) is revised and incorporated into Section 25.255(e).

Another commentator recommended certain changes in the arrangement of paragraphs in Section 25.255 along with other

changes already discussed above. The FAA believes, however, that the paragraphs of proposed Section 25.255, as revised, are in the most appropriate order for clarity.

One commentator stated that proposed Section 25.255 should be changed to be consistent with the manner in which the out-of-trim special condition has been applied in certification tests since 1965. The wording of the special conditions for various airplanes, and of related regulations Sections 25.251 and 25.253, has changed between 1965 and the present time. The proposal in the notice is based on the wording of recent special conditions.

Proposal 6-50. Proposed Section 25.703 would require a takeoff warning system to warn the pilots during the initial portion of the takeoff roll if the airplane is in a configuration that would prevent successful completion of the takeoff. One commentator recommended that the proposed requirement for both aural and visual warnings be changed to require either an aural or visual warning. Another commentator questioned the desirability of a visual warning, particularly at night, citing the time that may be lost in searching for a visual warning. The FAA agrees with the latter comment. Accordingly, the requirement for an aural warning is retained and the requirement for a visual warning is withdrawn.

One commentator recommended that the words "including any of the following" (configurations) in proposed Section 25.703(a) be changed to "consisting of the following" (configurations). The FAA does not agree since a particular airplane design may incorporate some other variable geometry device that would not allow a safe takeoff when in the wrong position.

The same commentator stated that proposed Section 25.703(c), which would require that the means used to activate the system function properly throughout the ranges of takeoff weights, altitudes, and temperatures for which certification is requested, is superfluous and should be deleted. The FAA believes that this paragraph should be retained to clearly define the scope of the requirements.

This commentator also recommended deletion of proposed Section 25.703(d) which would require that the system be designed to provide reliable sensing of an unsafe position of each critical aerodynamic surface. The commentator stated that such a system would be unworkable, over-sophisticated, and could degrade flight safety through numerous nuisance warnings. He pointed out that critical aerodynamic surfaces would include ailerons, rudder, and spoilers, and that "proper" position of such surfaces during takeoff would be affected by cross winds, engine failure, etc. The FAA agrees that the requirements in proposed Section 25.703(d) could result in a warning system so complex that its effectiveness may be impaired. Proposed paragraph (d) is therefore withdrawn.

In regard to proposed Section 25.703(b), one commentator

recommended that consideration be given to a system cutoff at some significant airspeed, e.g., 100 knots. It was stated that any valid warning would probably have sounded by the time that speed is reached and the cutoff would preclude unwarranted aborts due to warning system malfunction at high speeds. Proposed Section 25.703(b) would require the warning to continue until the configuration is changed to allow a safe takeoff, the takeoff roll is terminated, or the warning is manually deactivated by the pilot. The FAA agrees that a system cutoff at high speeds should be permitted, but believes that the cutoff should not be set below the V sub 1 speed, since the takeoff can be rejected within the established accelerate-stop distance from any speed up to V sub 1. Since the next speed above V sub 1 that can be sensed by a simple means is V sub R (e.g., by nose gear switches), the FAA believes that deactivation of the takeoff warning system should be allowed when the airplane is rotated for takeoff. Proposed Section 25.703 is revised accordingly.

With respect to the requirement in proposed Section 25.703(b) that the warning must continue until the takeoff roll is terminated, the intention of the proposal was not to require that the warning must continue until the airplane is brought to a full stop, but that it must continue until action is taken by the pilot to terminate the takeoff roll, for example by closing all throttles. Proposed Section 25.703(b) is revised accordingly.

Another commentator objected to the proposal, stating that the warning system would eliminate reliance on the checklist and induce more hazards than it is designed to eliminate. The FAA does not agree that the warning system would eliminate reliance on the checklist; instead it would serve as a back-up for the checklist, particularly in unusual situations, e.g., where the checklist is interrupted or the takeoff is delayed. The commentator stated that the additional aural warning system would add to the problem of cockpit confusion caused by the multitude of aural warning requirements. The FAA does not agree since the takeoff warning would occur during the initial portion of the takeoff roll and therefore should not be confused with flight over-speed warning, stall warning, or landing gear warning during approach. The commentator added that it is doubtful if a reliable, practical, safe system can be designed, much less for a cost that would approximate the possible benefits. The FAA does not agree since such systems have been developed and used on relatively complex airplanes. The warning systems can be simpler on airplanes having fewer or less critical variable geometry devices.

One commentator recommended that consideration be given to including unreleased brakes in the takeoff warning system in view of the serious consequences of failing to release brakes fully before takeoff. The FAA does not now have sufficient information to justify adopting the suggestion made by this commentator.

The proposed new Section 25.703 is adopted with the revisions discussed above and a nonsubstantive revision for

clarity.

Proposal 6-51. One commentator suggested the use of the word "suspended" rather that "silenced" in proposed Section 25.729(e)(3). The FAA agrees with this suggestion, since it would result in consistency of wording between this section and proposed Section 23.729(f)(1). Section 25.729(e)(3) is revised accordingly.

Proposal 6-52. For comments related to the proposal to revise Section 25.1043(b), see Proposal 6-23.

Proposal 6-53. No unfavorable comments were received on the proposal to revise Section 25.1501. Accordingly, the proposal is adopted without substantive change.

Proposal 6-54. For comments related to the proposal to

revise Section 25.1521(e), see Proposal 6-23.

Proposals 6-55 and 2-96. One commentator recommended that proposed Section 25.1581(a)(2), which would require that the Airplane Flight Manual contain "Other information necessary for safety," be deleted. He stated that the proposed requirement would be far too broad, and could include all information now provided in the crew operating manual. The FAA agrees that the proposed wording may be too broad, but does not agree that all requirements for additional information should be eliminated. Section 25.1581(a)(2) as adopted requires other information that is necessary for safe operation because of design, operating, or handling characteristics. This wording is the same as current Section 25.1581(c), except that the word "unusual" is deleted for the reasons stated in notice.

The same commentator also recommended deletion of proposed Section 25.1581(b), which would require that each part of the manual containing required information be approved, segregated, identified, and clearly distinguished from each unapproved part of the manual. The commentator stated that he is not aware of any unapproved sections of the Airplane Flight Manual, and that the proposal implies a crew manual with the FAA limitation data so marked. The FAA does not agree with the recommended deletion of this requirement. The proposed paragraph is the same as current Section 25.1581(b), and is intended to cover cases where the applicant desires to include information in the manual that is not required by the FAA.

Proposal 6-55 to amend Section 25.1581 is adopted with the revisions discussed above.

The disposition of Proposal 2-96, which proposed to add a new Section 25.1581(d) (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-55. No unfavorable comments were received on Proposal 2-96 and the proposal to add a new Section 25.1581(d) is adopted without

substantive change.

Proposal 6-56. For comments related to the proposal to amend Section 25.1583, see Proposal 6-23.

Proposals 6-57 and 2-87. No unfavorable comments were received on the proposal to amend Section 25.1585. Accordingly, the proposal is adopted without substantive change.

Disposition of Proposal 2-87 to amend Section 25.1353 (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-57. Proposals 2-39, 2-131, and 2-186 to amend Sections 23.1353, 27.1353, and 29.1353, respectively (Notice 75-10), are substantively identical to Proposal 2-87 and all of these proposals are discussed below.

Commentators suggested that proposed Sections 25.1353(c)(5) and 29.1353(c)(5) be revised by adding the word "or" between paragraphs (c)(5)(i) and (c)(5)(ii) to allow an alternative design. The commentators misinterpreted the proposal. The sections as adopted provide for three alternatives with an "or" between paragraphs (c)(5)(ii) and (c)(5)(iii) and with an "or" understood between paragraphs (c)(5)(i) and (c)(5)(ii).

One commentator suggested that the proposals should be broadened to include nickel cadmium battery installations other than those capable of being used to start an engine or an auxiliary power unit. The proposals apply only to nickel cadmium batteries that are subject to a rapid drain because they are used to start an engine or auxiliary power unit. The FAA does not have enough information to indicate that in other installations the drain on nickel cadmium batteries is sufficiently rapid to require compliance with the proposed provisions.

One commentator objected to proposed Sections 27.1353(f) and 29.1353(c)(5) on the basis that the requirement should be limited to nickel cadmium batteries other than 20-cell batteries and to only certain battery locations. The commentator also stated that the requirement for helicopters should be different from that for airplanes since helicopters are able to execute an emergency landing much quicker than airplanes. The FAA has insufficient information at the present time to warrant any of the distinctions suggested by the commentator.

The FAA believes that the requirement in proposed Section 25.1353(c)(5) concerning operating procedures in the Airplane Flight Manual should be transferred to Section 25.1585(a), since that section pertains to operating procedures. The proposal for Section 25.1353(c)(5) is revised and Section 25.1585(a) amended accordingly. The remainder of proposed Section 25.1353(c)(5) is redesignated Section 25.1353(c)(6) in view of the adoption of a new Section 25.1353(c)(5) in Amendment No. 5. The same revisions are also made to proposed Sections 23.1353(f), 27.1353(f), and 29.1353(c)(5), designated as Sections 23.1353(g), 27.1353(g), and 29.1353(c)(6), respectively, and to Sections 23.1585, 27.1585,

and 29.1585.

Proposals 6-58 and 2-98. Proposed Sections 25.1587(c)(5) and (c)(6), which would add requirements for information on the vertical distance for transition to approach climb determined under proposed Section 25.121(e) (Proposal 6-38), and on the en route net flight path data determined under proposed Section 25.123 (Proposal 6-39), are withdrawn in view of the withdrawal of Proposals 6-38 and 6-39.

Disposition of Proposal 2-98 to revise Section 25.1587 (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-58. No unfavorable comments were received on Proposal 2-98 and it is adopted as proposed except that the reference in proposed Section 25.1587(b)(4) to Section 25.101(c) is changed to reference Sections 25.101(f), (g), and (h). Current Section 25.1587(c)(3), on which proposed Section 25.1587(b)(4) is based, was adopted as part of the recodification of Part 4b of the Civil Air Regulations, effective February 1, 1965 (29 FR 18289). Specifically, Section 25.1587 replaced Section 4b.743 of the CARs and Section 4T.743 of Special Civil Air Regulation 422B. Section 4T.743(c), which was replaced by Section 25.1587(c)(3), referenced Section 4T.111(c) and the requirements of Section 4T.111(c) are now contained in Sections 25.101(f), (g), and (h), not Section 25.101(c) as the current rule indicates. The purpose of the recodification program was simply to clarify the regulations. No substantive changes, other than relaxatory ones that were completely noncontroversial, were intended. The FAA believes that the change being made is a nonsubstantive editorial change since Section 25.1587(c)(3) has been consistently interpreted in accordance with the rule as originally set forth in Section 4T.743(c) of Special Civil Air Regulation 422B.

Proposal 6-59. For comments related to the proposal to amend Section 27.25(b), see Proposal 6-5. The proposal to amend Section 27.25(b) is adopted without substantive change.

Proposal 6-60. For comments related to the proposal to amend Section 27.29, see Proposal 6-5.

Proposal 6-61. Proposed new Sections 27.33(e) and 29.33(e) (Proposal 6-77) would require a main rotor low-speed warning for each single engine helicopter and each multi-engine helicopter that does not have an approved device that automatically increases power on the operating engines when one engine fails. Several commentators stated that operating experience does not indicate the need for a main rotor low-speed warning and that the instruments furnished the pilot are adequate to monitor rotor r.p.m. safely. One of these commentators also stated that if the warning is set high enough to be effective, the pilot will rely on it in lieu of monitoring rotor r.p.m. as he should and that the warning will activate during low r.p.m. transients which are entirely safe and this may cause pilot action that is unsafe. The commentator stated that since the National Transportation

Safety Board (NTSB) has recommended an engine failure warning device on all turbine engines, this proposal should be withdrawn or deferred until action has been taken on the NTSB recommendations. The FAA does not agree. In regard to the comments concerning monitoring of instruments and rotor r.p.m. by the pilot, it should be noted that one of the main reasons for providing rotor low-speed warning is to assist the pilot in maintaining safe rotor speed after an engine failure when his attention is directed to flight path control and emergency procedures. With respect to activation of the warning during low-rotor r.p.m. transients, the FAA believes that the warning can be set to avoid nuisance warnings in normal maneuvers and still meet the requirements of this section. The NTSB Release for Safety Recommendations A-75-72 and 73, issued September 2, 1975, recommended that Parts 27 and 29 be amended to require that all turbine engine-powered helicopters be equipped with a prominent engine-out visual warning system and an aural warning system which can be heard with or without the use of a headset. The FAA believes, as stated in its response to the NTSB, that the proposed requirement for rotor low-speed warning is more desirable than an engine-out warning since a rotor low-speed warning would warn the pilot of an unsafe low rotor speed due to any cause, including engine failure, and will continue the warning function during power-off descent and landing.

One commentator noted that the FAA has imposed special conditions requiring engine-out warnings on certain turbine engine-powered helicopters, and stated that engine-out warnings should not be required in addition to rotor low-speed warning. The FAA does not believe it will be necessary to issue a special condition requiring installation of an engine-out warning on those helicopters with a rotor low-speed warning.

One commentator objected to the deletion of Sections 27.33(b)(3) and 29.33(b)(3). Current Sections 27.33(b)(1), (b)(2), and (b)(3) (and Sections 29.33(b)(1), (b)(2), (b)(3)) provide, for all rotorcraft, three alternative methods for showing that main rotor speeds substantially less than the minimum approved main rotor speed will not occur under any sustained flight condition with power on. One of the alternatives, paragraph (b)(3), is to provide adequate means to warn the pilot of unsafe main rotor speeds, but the proposal would delete this paragraph, thus requiring all rotorcraft to comply with paragraph (b)(1) or (b)(2). This was not the intent of the proposal. Accordingly, Sections 27.33(b)(3) and 29.33(b)(3) are retained. In addition, for clarification, the lead-in of Sections 27.33(b) and 29.33(b) are revised so that they are only applicable to rotorcraft that are not required to have a main rotor low-speed warning under Section 27.33(e) or Section 29.33(e), respectively.

Proposal 6-62. Two commentators objected to the proposals for Sections 27.45 and 29.45, stating that the basis for humidity levels has not been determined and varies between engines. These commentators further stated that there is no industry agreement

on the effect of humidity on power or that humidity has a significant effect on power. The effects of humidity on the power of reciprocating engines are well understood and are generally the same between engine types. The effects of humidity on the power or thrust of turbine engines may differ between engine types. The proposal, however, establishes a reference humidity structure for the development of rotorcraft performance data. It does not prejudge the nature of the corrections, if any, which may be required. Each turbine engine must be evaluated to determine the effect of humidity on thrust or power, and, where rotorcraft performance is affected, it must be based on the humidity reference condition.

One commentator objected to the proposals on the basis that the humidity reference for turbine engine-powered rotorcraft may not be representative of average humidity conditions encountered in service. No safety problem has been identified with the use of the proposed humidity reference in the type certification of transport category airplanes, and the reference is considered equally valid for the type certification of rotorcraft.

One commentator questioned why a reciprocating engine-powered rotorcraft would be required to use a humidity correction different from that for turbine engine-powered rotorcraft. The humidity correction proposed for reciprocating engine-powered rotorcraft is similar to the current requirements for reciprocating engine-powered transport category airplanes and the proposed humidity correction for turbine engine-powered rotorcraft is similar to the current requirements for turbine engine-powered transport category airplanes, and the requirements for transport category airplanes have been administered without difficulty. In addition, the humidity correction requirements for turbine engine-powered rotorcraft are based on the fact that the power or thrust of turbine engines diminishes significantly as the ambient atmospheric temperature is increased. Power or thrust variations related to humidity could therefore have an adverse effect upon safety at temperatures above standard.

The proposal to revise Section 27.45 and the proposal to amend Section 29.45 are adopted without substantive change.

Proposals 6-63 and 2-100. Under proposed Section 27.65(b)(2), if the never-exceed speed V sub NE is less than the best rate-of-climb speed V sub Y at any altitude within the range for which certification is requested, the steady rate of climb must be determined over the entire range of weights, temperatures, and altitudes for which certification is requested. One commentator recommended that the rate of climb information be required only for the range of altitudes where V sub NE is less than V sub Y, instead of the entire range of altitudes. The FAA disagrees. The climb performance and speed of a helicopter may change significantly below, as well as above, the altitude at which V sub NE is less than V sub Y. However, after further review, the FAA believes that it is only necessary that climb data be determined over the range of altitudes from 2,000 feet

below the altitude at which V sub NE is equal to V sub Y up to the maximum altitude for which certification is requested. The proposal to amend Section 27.65 is revised accordingly.

In addition, proposed Section 27.65(b)(2)(i) is revised to allow the rate-of-climb to be determined at the climb speed selected by the applicant (instead of the most favorable climb speed) at or below V sub NE. The FAA believes that the proposed paragraph (b)(2)(i) would impose an unnecessary burden on the applicant and result in complex operating information, since the most favorable climb speed may be a function of several variables.

Disposition of Proposal 2-100 to amend Section 27.65(a)(2) (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-63. No unfavorable comments were received on the proposal to amend Section 27.65(a)(2). Accordingly, the proposal is adopted without substantive change.

Proposal 6-64. Proposed Section 27.67(c) would require the determination of the one-engine-inoperative steady rate of climb with maximum continuous power on the operating engines, and (for helicopters for which certification for the use of 30-minute power is requested) at 30 minute power. One commentator said that there is no need to show the climb performance data for both the maximum continuous and 30-minute power levels and, therefore, the word "and" preceding the parenthetical expression should be changed to "or". The FAA does not agree. Even though an applicant may request certification for the use of 30-minute power, climb performance data for maximum continuous power should be furnished to the pilot for use in operations that may require more than 30 minutes to reach a safe landing area after failure of one engine, e.g., over-water operations. Accordingly, Section 27.67(c) is adopted without substantive change.

Proposal 6-65. No unfavorable comments were received on the proposal to revise Section 27.75(a)(2)(ii). Accordingly, the proposal is adopted without substantive change.

Proposal 6-66. No unfavorable comments were received on the proposal to amend Section 27.143. Accordingly, the proposal is adopted without substantive change.

Proposal 6-67. No unfavorable comments were received on the proposal to revise Section 27.175(c). Accordingly, the proposal is adopted without substantive change.

Proposal 6-68. For comments related to the proposal to revise Section 27.1043(b), see Proposal 6-23.

In addition, a nonsubstantive editorial change is being made to the lead-in of Section 27.1043(a) to reference Section 27.1041(b) instead of Section 27.104(b).

Proposal 6-69. No unfavorable comments were received on the

proposal to revise Section 27.1501. Accordingly, the proposal is adopted without substantive change.

Proposals 6-70 and 2-135. Disposition of Proposal 2-135 to amend Section 27.1545 (Notice 75-10) was deferred so it could be considered in connection with Proposal 6-70 to amend Section 27.1505. No unfavorable comment was received on Proposal 2-135. Accordingly, the proposal is adopted without substantive change.

Proposed Sections 27.1505(c) and 29.1505(c) (Proposals 6-70 and 6-84, respectively) would allow the establishment of a never-exceed speed, V sub NE (power-off), that is less than V sub NE with power on, if V sub NE (power-off) is not less than a speed midway between the power-on V sub NE and the speed for maximum range in autorotation at maximum weight. One commentator recommended that "V sub Y or the climb speed selected by the applicant in demonstrating compliance with the climb requirements" be inserted in proposed Section 27.1505(c) in place of the speed for maximum range in autorotation. The commentator stated that since determination of the speed for maximum range in autorotation is not presently required, the substitution of the climb speed (which is determined under the climb requirements in Sections 27.65 or 27.67) would accomplish the intent of placing a lower limit on V sub NE (power-off) without unnecessary additional demonstration requirements.

After further consideration, the FAA believes that the speed used in determining climb performance (one-engine-inoperative climb performance, if applicable) should be used in establishing a V sub NE (power-off) for both Part 27 and 29 helicopters, instead of the speed for maximum range in autorotation at maximum weight. The speed midway between power-on V sub NE and the appropriate climb speed is expected to be high enough to provide the pilot with an adequate range of speeds and glide angles during autorotation. In addition, the determination of V sub NE (power-off) will be based on information already required to be furnished by the applicant which would not be the case if the speed for maximum range in autorotation were prescribed since it is only required to be determined for certain Part 29 Category B helicopters. The proposals to amend Sections 27.1505 and 29.1505 are revised accordingly.

Proposal 6-71. For comments related to the proposal to add a new Section 27.1521(f), see Proposal 6-23.

Proposal 6-72. No unfavorable comments were received on the proposal to add a new Section 27.1527. Accordingly, the proposal is adopted without substantive change.

¢For discussion concerning the amendment of Section 27.1545, see Proposals 6-70 and 2-135.|

Proposals 6-73, 2-139 and 2-140. No unfavorable comments were received on Proposal 6-73 to amend Section 27.1581. The proposal is adopted without substantive change, except that

proposed Section 27.1581(a)(2) is revised in accordance with the discussion of the proposal to amend Section 25.1581 (Proposal 6-55).

Disposition of Proposals 2-139 to amend Section 27.1581 and 2-140 to amend Section 27.1587 was deferred so that these proposals could be considered in connection with Proposal 6-73. No unfavorable comments were received on Proposal 2-139 or Proposal 2-140. Proposal 2-139 to amend Section 27.1581 is adopted without substantive change. For reasons that are stated in the discussion of Proposal 6-23 for Section 23.1521(e), Proposal 2-140 to amend Section 27.1587 is revised by adding a new Section 27.1587(a)(2)(iii) requiring information on the maximum ambient atmospheric temperature at which compliance with the cooling requirements was shown. Additionally, the parenthetical phrase "(if provided)" is deleted from Section 27.1587(b) since the amendment to Section 27.1581 requires that a Rotorcraft Flight Manual be furnished for each rotorcraft. The proposal to amend Section 27.1587 is adopted with the changes discussed above.

Proposal 6-74. For comments related to the proposal to amend Section 27.1583, see Proposal 6-23.

Proposals 6-75 and 2-131. Proposed Sections 27.1585(c) and 29.1585(c) would require the operating procedures section of the Rotorcraft Flight Manual to contain information on the procedures for reducing airspeed to V sub NE (power-off) for helicopters for which a V sub NE (power-off) is established under Sections 27.1505(c) and 29.1501(c), respectively. One commentator stated that he did not favor systematically placing explicit engine, altitude, and V sub NE (power-off) limitations in the "limitations" chapter of the Flight Manual. The commentator apparently misinterpreted the proposal, as it would affect only the operating procedures section, not the limitations section. The commentator also stated that these explanations should only be required when they bring significant information to the pilot and when the limitation results from an indirect and not an obvious cause. The FAA believes that in view of the surprise element that may be associated with engine failure in service operations, the procedure for reducing airspeed to not more than V sub NE (power-off) should be furnished for each helicopter for which a V sub NE (power-off) is established. Accordingly, the proposals for Sections 27.1585(c) and 29.1585(c) are adopted without substantive change.

Disposition of Proposal 2-131 to amend Section 27.1353 (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-73. For comments related to proposed Section 27.1353(f) and for an explanation of the revision to proposed Section 27.1353(f), see the discussion of Proposal 2-87 under Proposal 6-57.

Proposal 6-76. For comments related to the proposal to amend Section 29.29, see Proposal 6-5.

Proposal 6-77. For comments related to the proposed amendment of Section 29.33, see Proposal 6-61 for Section 27.33.

Proposal 6-78. For comments related to proposed Section 29.45, see Proposal 6-62.

Proposal 6-79. One commentator recommended that proposed Section 29.65(c) be revised to require climb data only for those altitudes where V sub NE is less than V sub Y at sea level. For a discussion of this comment and the explanation for the revisions to proposed Section 29.65(c), see Proposal 6-63. This commentator also stated that proposed Section 29.65(c) is superfluous for Category B rotorcraft since it duplicates the requirement of proposed Section 29.65(a)(4). The FAA agrees that some clarification is needed and proposed Section 29.65(a) and (c) are revised to list all of the Category B requirements in paragraph (a) and to make paragraph (c) applicable only to Category A helicopters. For an explanation of the revisions to proposed Section 29.65(c)(1), see the discussion of the revision to proposed Section 27.65(b)(2)(i) under Proposal 6-63. Accordingly, the proposal is adopted with the revisions discussed above and under Proposal 6-63.

Proposal 6-80. No unfavorable comments were received on the proposal to amend Section 29.143. Accordingly, the proposal is adopted without substantive change.

Proposal 6-81. No unfavorable comments were received on the proposal to revise Section 29.175(c). Accordingly, the proposal is adopted without substantive change.

Proposal 6-82. For comments related to the proposal to revise Section 29.1043(b), see Proposal 6-23.

Proposal 6-83. No unfavorable comments were received on the proposal to revise Section 29.1501. Accordingly, the proposal is adopted without substantive change.

Proposals 6-84 and 2-188. For comments related to Proposal 6-84 to amend Section 29.1505, and for an explanation of the revisions to proposed Section 29.1505(c), see Proposal 6-70.

Disposition of Proposal 2-188 to amend Section 29.1545 (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-84 to amend Section 29.1505. No unfavorable comments were received on Proposal 2-188. Accordingly, the proposal is adopted without substantive change.

Proposal 6-85. For comments related to the proposal to revise Section 29.1521(e), see Proposal 6-23.

Proposal 6-86. No unfavorable comments were received on the proposal to add a new Section 29.1527. Accordingly, the proposal is adopted without substantive change.

¢For discussion concerning the amendment of Section 29.1545, see Proposals 6-84 and 2-188.|

Proposals 6-87 and 2-192. Proposal 6-87 proposed to revise Section 29.1581(a) and (b) and to delete Section 29.1581(c) and mark it "¢Reserved|." Disposition of Proposal 2-192 to add a new Section 29.1581(d) (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-87.

No unfavorable comment was received on Proposals 6-87 or 2-192. These proposals to amend Section 29.1581 are adopted without substantive change except that proposed Section 29.1581(a)(2) is revised in accordance with the discussion of the proposal to amend Section 25.1581 (Proposal 6-55).

Proposal 6-88. For comments related to the proposal to amend Section 29.1583, see Proposal 6-23.

Proposals 6-89 and 2-186. For comments related to Proposal 6-89 to add a new Section 29.1585(c), see Proposal 6-75.

Disposition of Proposal 2-186 to amend Section 29.1353 (Notice 75-10) was deferred so that it could be considered in connection with Proposal 6-89. For comments related to proposed Section 29.1353(c), see the discussion of Proposal 2-87 under Proposal 6-57.

Proposal 6-90. No unfavorable comments were received on the proposal to amend Section 91.31. Accordingly, the proposal to amend Section 91.31 is adopted without substantive change.

Proposal 6-91. The proposal to amend Section 91.37 was made to implement Proposals 2-49, 2-51, 2-52, and 2-93 to amend Sections 25.105, 25.125, 25.241 and 25.1533, respectively, contained in Airworthiness Review Notice No. 2 (Notice 75-10). Since the proposed amendments to Part 25 have been withdrawn (41 FR 55454), Proposal 6-91 is also withdrawn.

Proposal 6-92. Proposed Section 121.141(b) would authorize an air carrier to revise the operating procedures and the format of the performance data for the applicable Airplane or Rotorcraft Flight Manual and include the revised information in the operator's manual required by Section 121.133, if the revised procedures and performance data presentation are approved by the Administrator and are clearly identified as flight manual requirements. One commentator said that there was no need for the identification of the flight manual material. This requirement is in the current rule and the FAA does not have sufficient information at the present time to justify deleting it, especially with regard to the operating limitations.

The commentator also suggested that the second sentence of proposed Section 121.141(b) would be clarified by inserting a

clause indicating that if the certificate holder elects to carry the manual required by Section 121.133, he must retain all of the limitations section (of the flight manual) as written, unless deviations are specifically authorized by the Administrator. The FAA does not believe that the suggested change is necessary or appropriate. Proposed Section 121.141(b) would not authorize a change in the substance or presentation of the operating limitations required for the applicable flight manual. Accordingly, the proposal to revise Section 121.141(b) is adopted without substantive change.

DRAFTING INFORMATION

The principal authors of this document are Paul C. Spiess and Charles J. Maple, Flight Standards Service, and Keith S. May, Office of the Chief Counsel.

ADOPTION OF THE AMENDMENT

Accordingly, Parts 1, 21, 23, 25, 27, 29, 91, and 121 of the Federal Aviation Regulations are amended, effective March 1, 1978.

(Secs. 313(a), 601, 603, 604, and 605 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, 1424, and 1425); and sec. 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).)

Note - The Federal Aviation Administration has determined that this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11821, as amended by Executive Order 11949, and OMB Circular A-107.

Amendment 21-47

Civil Supersonic Airplanes

Noise and Sonic Boom Requirements

Adopted: June 26, 1978 **Effective: July 31, 1978**

(Published in 43 FR 28406, June 29, 1978)

SUMMARY: These final rules (1) require all civil supersonic airspaces (SSTs), except Concordes with flight time before January 1, 1980 (presently expected to include 16 Concordes), to comply with the noise limits of Part 36 of Title 14 of the Code of Federal Regulations ("Part 36") that were originally applied to subsonic airplanes, in order to operate in the U.S.; (2) prohibit the issuance of U.S. Standard Airworthiness Certificates to Concordes that do not have flight time before January 1, 1980 and that do not comply with Part 36; (3) prohibit the operation

in the U.S. of the excepted Concorde airplanes if they have been modified in a manner that increases their noise; (4) prohibit scheduled operations of the excepted Concorde airplanes at U.S. airports between 10 p.m. and 7 a.m., and (5) prohibit SSTs that are outside the U.S. from causing sonic booms in the U.S. when flying to or from U.S. airports. These provisions respond to the public need for the control of sonic boom and SST noise in accordance with Section 611 of the Federal Aviation Act of 1958, as amended by the Noise Control Act of 1972. These rules do not establish certification noise limits for future design SSTs, since the technological feasibility of such standards is at present unknown. The FAA's goal is not to certificate, or permit to operate in the United States, any future design SST that does not meet standards then applicable to subsonic airplanes. This rule is issued following close coordination with the U.S. Environmental Protection Agency (EPA). A detailed discussion of FAA's disposition of EPA's proposals concerning SST noise is contained in a separate Notice of Decision published in this issue of the Federal Register.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION

SYNOPSIS

A detailed section-by-section analysis of these rules is furnished at the conclusion of this preamble. Briefly, these rules are substantively the same as those proposed in Notice No. 77-23 on October 13, 1977, and have the following effects:

SST Operations in the United States

Except for the 16 Concordes which are expected to have flight time before January 1, 1980, all SSTs are required by these rules to comply with the noise limits of Part 36 in effect on January 1, 1977 ("Stage 2 noise limits") in order to operate in the United States. These are the same noise limits that were originally applicable to subsonic airplanes by Part 36. It is the FAA's goal not to certificate or permit to operate in the United States any future design SST that does not meet standards then applicable to new design subsonic airplanes. Accordingly, consistent with technological developments, the noise limits in this rule are expected to be made more stringent before a future design SST is either type certificated or permitted to operate in the United States.

The First 16 Concordes

The first 16 Concordes, which is the maximum number that the Britain and France are expected to manufacture before January 1, 1980, are expected from compliance with the Stage 2 noise limits of Part 36. There is presently no expiration date on this exception. However, under these rules, the excepted Concordes may not be operated on flights scheduled, or otherwise planned, for takeoff or landing at U.S. airports after 10 p.m. and before 7 a.m. local time. Moreover, these rules subject the expected Concordes that operate in the U.S. to an "acoustical change" requirement identical to that applied to U.S. type certificated subsonic airplanes that have not been shown to comply with Stage 2 noise limits. Like those subsonic airplanes (which are called "Stage 1 airplanes" in Part 36), the noncomplying Concordes may not be operated in the U.S. if their design is changed in a way that increases their noise levels.

Later Concordes: "New Production" Rule

Although it is expected that Concordes will not be produced beyond January 1, 1980, such production is possible. Accordingly, for any Concorde that does not have flight time before January 1, 1980, this rule prohibits the issuance of a U.S. Standard Airworthiness Certificate unless the airplane complies with at least the Stage 2 noise limits of Part 36.

Concorde Type Certification: Noise Limits

The British-French Concorde is the only SST for which application has been made for a U.S. type certificate. A U.S. type certificate constitutes FAA approval of the safety and environmental aspects of an airplane type and is necessary for American air carriers to operate the airplane. Because there is no presently known technology which would reduce Concorde noise levels, the maximum noise limits (or approach, takeoff, and sideline) authorized at this time by these rules for the purposes of a U.S. type certificate are the current noise levels of that airplane.

Concorde Type Certification: Test Procedures

These rules broaden the detailed noise measurement and evaluation procedures of Part 36 to cover supersonic (as well as subsonic) civil airplanes. In addition, various flight test provisions unique to the Concorde are included because of the special takeoff and approach testing considerations posed by the delta wing of that airplane.

Airport Proprietors' "Local Option": No Change

These rules do not in any way affect existing legal authority of airport proprietors, acting as proprietors, to exercise their "local option" to limit the use of their airports in a manner that is not unjustly discriminatory, and does not

unduly burden interstate and foreign commerce. As stated in Section 36.5 of Part 36, an FAA determination of compliance or noncompliance with Part 36 does not bind an airport proprietor in its determination whether an airplane is acceptable or unacceptable for operation at its airport.

Sonic Boom

These rules prohibit SSTs from producing sonic booms in the United States while they are going to or from U.S. airports, even if the airplane is outside the U.S. at the time. Prior to these rules, supersonic flight was prohibited only while the airplane itself was in United States airspace.

Continued Operations of Concorde

Consistent with the provisions of these rules, FAA amendments to operations specifications of air carriers that operate Concorde may be issued without additional environmental analysis up to the numbers of total Concorde operations specified for each airport analyzed in the final environmental impact statement (EIS) for these rules. Federal issuance or amendment of operations specifications has no bearing on local airport proprietor approval of Concorde operations.

By the terms of the FAA operations specifications issued to the British Airways and Air France in April 1976, the 16-month demonstration period at Dulles Airport ended September 24, 1977. After Secretary of Transportation Brock Adams announced his decision on September 23, 1977 to issue Notice No. 77-23, the two carriers were issued amendments to their operations specifications to permit the number of Concorde operations that were originally approved on February 4, 1976 (one flight per day per carrier) to continue until the issuance of these rules. After the effective date of these rules, upon application by an air carrier, Concorde operations will be authorized at Dulles International Airport up to the numbers specified in the EIS for these rules.

The 16-month demonstration period at John F. Kennedy International Airport ("JFK"), for which two Concorde flights per day for each carrier were authorized, began on November 22, 1977. However, the issuance of these rules supersedes that authorization. Authorization of Concorde operations up to the number studied in the EIS will not require further environmental analysis.

Consistency with Safety

These rules regulate only the noise of SSTs. They do not dispose of airworthiness issues concerning the Concorde that are currently being evaluated under applicable airworthiness

regulations. These rules are consistent with the highest degree of safety in air commerce.

Future SST's: Progressive Noise Reduction

With the issuance of these rules, the FAA takes the first step towards ensuring that future SSTs are subject to the same noise levels as subsonic aircraft, and are made as fully compatible with future airport environments as possible. It is anticipated that no future SST design will be type certificated without the issuance by the FAA, after full public participation, of noise regulations that are environmentally effective and consistent with the economic and technological considerations in Section 611 of the Federal Aviation Act of 1958.

Section-by-Section Analysis

These rules amend provisions in three parts of the Federal Aviation Regulations - Part 21 (14 CFR Part 21), which contains the procedural requirements for the certification of aeronautical products; Part 36 (14 CFR Part 36), which contains the substantive noise limits and related noise measurement and test procedures that must be complied with for the issuance of type certificates and airworthiness certificates; and Part 91 (14 CFR Part 91), which sets forth the flight and other requirements that apply to the operation of aircraft.

Changes to Part 21 (14 CFR Part 21)

1. Acoustical Change: Certification.

Section 21.93(b)(1) and (2) are amended by deleting the word "subsonic." The effect of this amendment is to make the definition of the term "acoustical change" equally applicable to supersonic and subsonic airplanes. Under these procedures, for both supersonic and subsonic airplanes, an "acoustical change" exists whenever a voluntary change in the type design of airplane is applied for that might increase the noise levels of the airplane. Therefore, for both supersonic and subsonic airplanes, the acoustical change provisions of Part 36 (Section 36.7) must be complied with prior to approval of that type design change (see also the discussion of the proposed change to Section 36.7 and Section 91.309(b)(1), below).

2. SST "New Production" Rule.

Section 21.183(e)(1) is amended by deleting the word "subsonic." The effect, for supersonic as well as subsonic airplanes, is that a standard airworthiness certificate (which is the class of air airworthiness certificate required for U.S. air carrier operation and similar operations) is not issued for airplanes that have not had flight time before the **DATES** specified in Part 36 (Section 36.1(d)), unless compliance with the applicable noise standards in Part 36 is shown. (See also the discussion of the proposed revision of Section 36.1(d).)

This would extend, to SSTs, the rules applied to subsonic airplanes in Amendment 36-2 - popularly called the "new production" rule published in the Federal Register (38 FR 29569) on October 26, 1973.

Accordingly, Chapter I of Title 14 of the Code of Federal Regulations is amended, effective July 31, 1978.

(Secs. 307, 313(a), 601(a), 603, 611, Federal Aviation Act of 1958, as amended (49 U.S.C. Sections 1348, 1354(a), 1421(a), 1423, and 1431); Sec. 6(c), Department of Transportation Act (49 U.S.C. Section 1655(c); Title I, National Environmental Policy Act of 1969 (42 U.S.C. Sections 4321 et seq.); Executive Order 11514, March 5, 1970).

NOTE: The complete preamble to Amendment 21-47 is contained in Part 91, Amendment 91-153.

Amendment 21-48

Export Airworthiness Approvals

Adopted: March 6, 1979 **Effective: April 16, 1979**

(Published in 44 F.R. 15648, March 15, 1979)

SUMMARY: This amendment provides for the issuance of export certificates of airworthiness for unassembled normal category rotorcraft and export airworthiness approvals for aeronautical products that do not meet certain procedural requirements in cases where the importing country agrees to accept the products in such condition. This amendment will relieve applicants for export airworthiness approvals from unnecessary burdens with no adverse effect on safety. The amendment also up**DATES** certain form number references.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION: This amendment is based on a notice of proposed rule making issued as Notice 77-19 and published in the FEDERAL REGISTER on September 1, 1977, (42 F.R. 43985).

Notice 77-19, in addition to proposing to amend the export airworthiness approval requirements, also proposed certain changes to the Parts Manufacturer Approval (PMA) requirements. Notice 77-19A (42 F.R. 61048; December 1, 1977) reopened the comment period for the PMA proposals until January 4, 1978, and

Notice 77-19B (43 F.R. 15432; April 13, 1978) reopened the comment period for the PMA proposals until May 15, 1978. This

amendment excludes any consideration of the PMA proposals contained in Notice 77-19. As indicated in Notice 77-19B, PMA will be the subject of a separate rulemaking action.

Interested persons have been afforded an opportunity to participate in the making of this amendment and due consideration has been given to all matter presented. Three comments pertaining to the proposals to amend the export airworthiness approval requirements were received and they are discussed below.

BACKGROUND AND DISCUSSION OF COMMENTS

The primary purpose of an export airworthiness approval is to notify the importing country as to the airworthiness status of the product involved. Such notification serves the needs of both the foreign airworthiness authority approving a product for import and the purchaser of the purchaser of the product who intends to place it in operation.

Under regulations in effect since 1965, the requirements and procedures for export airworthiness approvals have helped to assure the export of quality products that meet safety standards at least as high as those applicable to products for domestic use. Moreover, even though an importing country has its own airworthiness authority capable of determining the airworthiness status of a product, U.S. regulations have required essentially full compliance with the FAA standards as a condition for issuance of a U.S. export airworthiness approval. In this connection, the regulations have provided only limited exceptions under which an importing country may elect to receive U.S.-manufactured products that are not in full compliance with FAA standards.

Section 21.325(b), in part, requires that new aircraft be assembled and flight-tested in order to qualify for export airworthiness approvals. By rule to date, only small airplanes and gliders manufactured under production certificates have been excepted from these requirements, subject to individual approvals by the importing countries. However, one U.S. rotorcraft manufacturer has been granted an exemption to allow similar treatment of its unassembled normal category rotorcraft.

Sections 21.329, 21.331, and 21.333 specify the standards and maintenance requirements which must be met by the various classes of aeronautical products in order to qualify for export airworthiness approvals. These regulations to date have contained no provision for allowing importing countries to waive any of these requirements. However, the FAA has issued a number of exemptions for Section 21.329(e) to allow issuance of export certificates of airworthiness for used engines that have not been

newly overhauled, subject to approval of the importing country.

Based on satisfactory experience with the limited regulatory exception pertaining to unassembled aircraft, and with the exemptions granted to date, the FAA has concluded that the export airworthiness regulations may be amended with no derogation of safety. Under this amendment, the primary purpose of export airworthiness approvals continues to be achieved and the same high standards for issuance of export airworthiness approval remain in effect. However, the amendment recognizes the ability of knowledgeable foreign airworthiness authorities to determine when strict compliance with FAA standards is not necessary or not desired by their respective countries in specific cases.

The procedures adopted by this amendment will relieve U.S. manufacturers and exporters of a number of burdens heretofore associated with obtaining export airworthiness approvals. The manufacturers of normal category rotorcraft will be able to realize cost and time savings by eliminating assembly and flight test. Moreover, the export of unassembled aircraft will eliminate the burden of an actual weighing and will facilitate air freight shipments. Provisions for non-compliance with requirements of the various classes of products subject to acceptance by the importing country, for example the requirement that used engines be newly overhauled, make possible substantial savings without derogating safety. Such savings increase the export potential of U.S.-manufactured aeronautical products and are therefore in the public interest. Finally, all persons subject to the regulations will have the benefits heretofore accorded only by exemption but without the administrative burden and cost and time delays associated with seeking exemptions.

This amendment is in furtherance of the FAA's policy to avoid regulations which are unnecessary to its aviation safety mission.

Contrary to the expressed concern of one commentator, the revised procedures will not adversely affect safety. In this connection, it should be noted that issuance of export airworthiness approvals will be conditioned on full disclosure to the foreign airworthiness authority, and the written acquiescence of that authority to FAA requirements that are not met in any given situation. In this manner, the decision to accept products that do not meet all the U.S. export requirements will properly rest with the airworthiness authority of the importing country. Without approval of the importing country, a product not meeting the regulatory standards will not be issued an export airworthiness approval.

Another commentator expressed general agreement with the proposals. However, he suggested that proposed Section 21.325 be changed to allow the export of unassembled rotorcraft of 12,500 pounds or less, maximum certificated takeoff weight, rather than limiting such exports to normal category rotorcraft. The commentator pointed to the export of unassembled fixed-wing

aircraft of 12,500 pounds or less, and asserted that the assembly of any aircraft of that weight involves the same degree of complexity. The FAA disagrees. Current standards provide that normal category rotorcraft must weigh 6,000 pounds or less while normal category airplanes may weigh up to 12,500 pounds. The complexity of an aircraft, and of its assembly, is dependent on more than weight alone. More important are the airworthiness requirements it must meet, a matter which is determined by the category into which the aircraft falls.

Finally, one commentator agreed with the proposals but suggested that Section 21.339(a) also be amended to permit a special export certificate to be issued for the export of an aircraft with a restricted U.S. certificate of airworthiness. This comment is not directly related to any of the proposals contained in Notice 77-19; however, the FAA is currently evaluating a petition for rulemaking which makes a similar proposal. Accordingly, action on this matter is not being taken in conjunction with this rulemaking action.

ADOPTION OF THE AMENDMENT

Accordingly, Subpart L of Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended, effective April 16, 1979.

(Secs. 313(a), 601, 603, and 608, Federal Aviation Act of 1958, as amended (49 U.S.C. 1354(a), 1421, 1423, and 1428); Sec. 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

Amendment 21-49

Exhibition, Air-Racing, and Amateur-Built Aircraft: Airworthiness Certificate and Repairman Certification

Adopted: August 2, 1979 **Effective: September 10, 1979**

(Published in 44 FR 46778, August 9, 1979)

SUMMARY: These amendments provide for the issuance of experimental certificates for exhibition, air-racing, and amateur built aircraft for periods longer than one year and for repairman certification of the primary builders of these aircraft, who may then perform the required condition inspection on such aircraft. The purpose of these amendments is to reduce, without any derogation of safety, the burden on certain experimental aircraft owners associated with annual recertification by the FAA.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION:

Background

These amendments to Parts 21 and 65 of the Federal Aviation Regulations (FAR) are based on a Notice of Proposed Rule Making (NPRM) issued as Notice 79-4 and published in the Federal Register on March 5, 1979 (44 FR 12042).

Notice 79-4 proposed to extend the duration of experimental certificates for aircraft certificated for the purpose of exhibition, air racing, or operating amateur-built aircraft for a period longer than one year. It also proposed that primary builders of these aircraft be eligible for repairman certification.

Interested persons have been afforded an opportunity to participate in the making of these amendments and due consideration has been given to all matter presented. Two hundred and twelve comments pertaining to the proposals were received and they are discussed below.

Present Section 21.181(a)(3) provides that an experimental airworthiness certificate is effective for one year after the date of issuance or renewal, unless a shorter period is prescribed by the Administrator. Generally, this has meant that aircraft having experimental certificates are recertificated annually by FAA inspectors. This recertification process has included a condition inspection performed by the FAA.

A recent survey indicates that there are about 9,000 aircraft on the U.S. Registry certificated in the experimental category; approximately 7,000 of these are certificated for the purpose of exhibition, air racing, or operating an amateur-built aircraft. This large and ever-increasing number of experimental aircraft, particularly the amateur-built, has resulted in extended delays for many applicants seeking certification or recertification of their experimental aircraft.

Extending the duration of these experimental certificates will relieve this burden on aircraft owners by eliminating the annual recertification by the FAA. Experience with the present rule has shown that safety considerations do not require that FAA inspectors conduct the annual recertification inspection of such aircraft provided that they are inspected in a manner similar to aircraft certificated in a standard category. To ensure an adequate level of safety, the FAA will impose an operating limitation during certification requiring that, at least once a year, the aircraft receive a condition inspection in accordance with Appendix D of FAR Part 43 and be found to be in a safe condition, and that an entry recording that inspection be made in the aircraft's maintenance records.

These inspections will be able to be conducted by a certificated mechanic holding an airframe and powerplant rating (A & P mechanic) or an appropriately rated repair station. In addition, these amendments will further reduce the burden on some owners by providing for the repairman certification under Part 65 of certain aircraft builders. If a person qualifies for certification, that individual will be allowed to perform the condition inspection on the aircraft that person has built. The builder's certification as an airman is required to satisfy Section 610(a)(2) of the Federal Aviation Act of 1958 which makes it unlawful for any person to serve in any capacity as an airman without an airman certificate authorizing him to serve in this capacity.

These amendments are issued in accordance with Executive Order 12044 and the Department of Transportation's Regulatory Policies and Procedures which are intended to reduce the unnecessary burdens of regulation on the public.

Discussion of Comments

A majority of the comments received in response to Notice 79-4 contained a recommendation that the duration of experimental certificates for amateur-built, exhibition, and air-racing aircraft be permanent or for an indefinite period. Other commenters suggested that the duration of the certificates be for the length of time the aircraft is owned by the builder while some others would specify a certain number of years. The FAA agrees that once the aircraft has been shown to pose no hazard to the general public it should be certificated for an unlimited time. Since most experimental aircraft do not conform to an FAA approved type design and must be subject to a trial period of operation, the initial period of certification must necessarily be of limited duration. The FAA certificating inspector must retain the latitude needed to establish the initial certification period based on personal inspection of the aircraft and data presented by the applicant. Thereafter, following the initial certification and successful operation within the assigned flight test area for a specified period of time, it is the FAA intent that amateur-built, air racing, and exhibition aircraft be given an experimental certificate of unlimited duration. The rule therefore provides that such aircraft will be certificated for an unlimited period unless the Administrator finds for good cause that a specific period should be established.

The FAA will monitor the safety record of the aircraft certificated under this new rule. Should it appear at any time in the future that certificates of specific duration are required in order to safeguard the general public, appropriate rule making action will be taken.

One commenter objected to the proposal on the ground that it was unsafe. His major concern was that the work on these aircraft be accomplished by an A & P mechanic or under his direct supervision. As an alternative to the proposal contained in

Notice 79-4, the commenter suggested that the construction of experimental aircraft be under the craftsmanship or direct supervision of a certificated mechanic, and that a mechanic holding an inspection authorization rating reissue the experimental certificate at the time of the annual inspection which would be conducted by such an inspector. The FAA has had a long-time policy of encouraging assistance of qualified private persons during aircraft construction and believes that amateur-aircraft builders should continue to utilize those persons if the need arises. A delegation of authority for issuance of experimental certificates, however, is not warranted. The FAA wishes to retain the responsibility for certification, including a determination that the aircraft is in a condition for safe operation, and for prescribing appropriate operating limitations. With respect to the conduct of the annual recurring condition inspection, the FAA has concluded that an inspection by the original builder if he holds a repairman certificate, an A & P mechanic, or a repair station holding appropriate ratings can provide a satisfactory level of safety.

As suggested above, the FAA concurs with the suggestion of several commenters that appropriately rated repair stations be allowed to conduct the annual inspection. No additional rule change is required to implement this decision.

In order to increase the time available to FAA inspectors for other required functions, one commenter suggested that A & P mechanics perform the in-progress construction inspections. He also objected to the issuance of repairman certificates to "so-called aircraft builders," many of whom, he contended, do not build the aircraft and lack building and maintenance skills. It is during the in-progress inspection that FAA inspectors can concurrently inspect the aircraft and begin their assessment of the builder's skills and qualification for repairman certification. Only qualified builders will be certificated. Thus, it is important that the FAA maintain its inspection role during aircraft construction. This commenter's contention that the repairman certification process and repairman surveillance will be a drain on the FAA inspectors' time is rejected. As already noted, much of this one-time determination of qualification will be made during the construction.

One commenter suggested that A & P mechanics were not sufficiently qualified to make the required condition inspection of certain sophisticated aircraft, such as ex-military and jet aircraft, and suggested that a mechanic holding inspection authorization should be required in these cases. Another commenter suggested that certificated mechanics with inspection authorization be required in all cases. The FAA disagrees. The scope of the recurring condition inspection is the same as that required for a 100-hour inspection of standard category aircraft. Since A & P mechanics have long been permitted to conduct 100-hour inspections, there is no reason to doubt their ability to conduct this inspection of experimental aircraft. Furthermore, under Section 65.81 a certificated mechanic may

perform only the maintenance for which he is rated, and that only if he has satisfactorily performed the work concerned at an earlier date.

Several commenters objected to the issuance of a repairman certificate to the original builder of an amateur-built aircraft. The concern was that the builder may have no experience in the inspection or direction of conditions causing or leading to defects in the aircraft. They also stated that, for the most part, the amateur-aircraft builder lacks the facilities and equipment necessary to maintain the aircraft, and therefore the annual inspection should be conducted by an authorized inspector. Those original builders who obtain repairman certification will have demonstrated, to the satisfaction of the FAA, sufficient knowledge and skill to allow them to inspect the aircraft they have built. The concern over lack of facilities is not valid. Under the present rule, the FAA inspector conducts the recertification inspection, for the most part, using the same facilities and equipment available to the aircraft owner.

Another commenter objected on two grounds. First, he asserted that having built a part of the aircraft does not qualify a person to inspect all of that aircraft. For example, he noted that while a home-built constructor may actually have built only a part of the airframe, his repairman certificate would permit him to inspect a power-plant, electrical, or hydraulic component of which he may not have sufficient knowledge. In this connection the scope and detail of the Part 43, Appendix D, inspection does not require extensive knowledge of such systems. It should be noted that in the case of repair stations, one which has only an appropriate airframe rating may conduct the inspection. Second, he objected to the fact that the FAA was turning over much administrative work to the general public rather than to a professional member of the aviation community. In fact, as a result of the adoption of these amendments there should be less administrative work since there will be no need for the owner to make annual application for recertification.

One commenter objected to the proposal on the ground that its adoption will impose a financial burden on owners who are not the original builders. Additional cost will be required for condition inspections. However, it is the conclusion of the FAA, apparently supported by most commenters who support the proposal, that such cost will be more than offset by relief from the time delays associated with seeking recertification of their aircraft by the FAA and by the added flexibility made available for selecting the time and place of inspection.

In a related matter, several commenters suggested that the services of an FAA inspector be available to owners of amateur-built aircraft who are not the original builders when they are unable to secure inspection from a certificated A & P mechanic. In those cases where an owner can show inability to get an inspection, he may apply for the services of an FAA

inspector. In addition an owner may also utilize an appropriately rated repair station to perform the required inspection.

Several commenters proposed that Experimental Aircraft Association designees be authorized to perform the condition inspection. As in the case of those owners who are not the original builders, the FAA would not have a standard by which to judge the knowledge and skills of these persons.

Two commenters suggested that persons who have constructed an aircraft from a kit should not be eligible for a repairman certificate. Furthermore, one of these commenters stated his belief that a repairman certificate should only be issued to a builder whose workmanship is of acceptable quality. It should be noted that according to Advisory Circulars 20-27B, dated April 20, 1972, and 20-28A, dated December 29, 1972, aircraft which are merely assembled from kits composed completely of prefabricated components and parts, and pre-cut pre-drilled materials, are not eligible for certification as amateur-built aircraft, since the major portion of the aircraft would not have been fabricated and assembled by the builder as is required by FAR Section 21.191(g). Although there is not a specific quality of workmanship requirement for receiving a repairman certificate, this is implicit in requiring that a person demonstrate to the satisfaction of the Administrator the requisite skill to determine whether the aircraft is in a condition for safe operation.

Several commenters suggested that a repairman certificate be made available to all owners of amateur-built aircraft after they demonstrate the required level of knowledge and skill needed to maintain their aircraft. Extending repairman certification to all owners of amateur-built aircraft would be impractical because the FAA does not have a standard by which to judge the knowledge and skills of owners who have not built their aircraft. The FAA conducts inspections of amateur-built aircraft at various stages of their construction. In this way, the builder is able to demonstrate the knowledge and skills considered necessary for conducting an inspection and determining that the aircraft will be in a condition for safe operations.

Because this observation of the builder and his work is the essential means for determining a builder's knowledge and skill required for issuance of a repairman certificate, the FAA rejects the suggestion of one commenter that a written examination be required. If such an examination is considered necessary, it can be required by administrative means; a regulation is not required.

One commenter suggested that once issued a repairman certificate on the basis of having built an amateur-built aircraft, a person should be allowed to inspect other amateur-built aircraft. Another commenter stated that the condition inspection should be able to be performed by any

amateur builder who had built an aircraft of the same type. The FAA cannot accept these suggestions. Although many amateur-built aircraft may be of similar type, they are not fabricated to a type design or specification and the builders frequently make changes based on personal desires or the availability of materials. These changes are often significant. Thus, the original builders may possess the expertise to inspect the aircraft they have built but not one built by another person or one of similar type.

Several commenters requested that the original builder of an amateur-built aircraft be allowed to continue to conduct the required inspection of the aircraft after its sale to a new owner, if the new owner so desired. Although the proposal did not address the situation directly, it was intended that the qualified original builder be allowed to continue to inspect the aircraft after its sale, at the request of the new owner.

Several commenters suggested a "grandfather" clause be applied to the issuance of repairman certificates to allow present amateur-built aircraft owners who are not the builders of the aircraft to be eligible for a repairman certificate. These commenters believe that since they have been performing their own maintenance and repairs under the present rule they should be qualified to perform the annual condition inspection under the new rule. A "grandfather" clause for amateur-built owners who are not the builders is not warranted. The nonbuilders do not have the privilege of performing the annual condition inspection under the present rule: therefore, they cannot be "grandfathered" to perform it under the new rule. As previously stated, the original builders are the ones who most likely will possess the expertise to inspect the aircraft they have built. To issue repairman certificates to amateur-built aircraft owners who are not the builders on the basis of their performing maintenance would require that the FAA issue repairman certificates to the present owners of exhibition and air-racing aircraft for the same reason. This would not be in the interest of safety.

One commenter proposed that the original builder be allowed to sign-off the recurring inspection and repairs performed by subsequent owners. As stated above, it is not in the interest of safety to allow nonbuilders to conduct the required inspection. Furthermore, while the FAA recognizes that qualified original builders have sufficient expertise to perform the inspection, it does not necessarily follow that they are sufficiently qualified to approve or disapprove another person's maintenance.

Several commenters proposed deletion of the citizenship requirement to be eligible for a repairman certificate. One of the commenters is a Canadian citizen who was admitted to the U.S. as a permanent resident and now holds an FAA Repairman Certificate. It is also noted that Section 501(b) of the Federal Aviation Act of 1958 was recently amended to allow an individual citizen of a foreign country who has been admitted to the United States as a permanent resident to register aircraft. Therefore,

proposed Section 65.104(a)(4) is revised to provide for the issuance of a repairman certificate to an individual citizen of a foreign country who has lawfully been admitted for permanent residence in the United States.

Two commenters suggested an annual inspection certificate be executed by the person performing the condition inspection. The original certificate would be contained in the logbook with a copy sent to the local district office. An annual inspection certificate is not deemed necessary. The amendment provides for the FAA to impose operating limitations requiring the condition inspection to be recorded in the aircraft's maintenance records. In the case of standard category aircraft, no certificate is issued. An entry is made in the maintenance records. This should be sufficient for experimental aircraft. However, in line with these comments, the FAA does make available an annual inspection reminder. This reminder is a decal which is secured in a conspicuous area in the aircraft and reminds the operator of the next inspection date.

One commenter suggested that the FAA perform spot checks to ensure the quality of maintenance and condition inspections of these experimental aircraft. This is an ongoing function of the FAA as to all aircraft and such surveillance will continue.

Several commenters suggested revising the applicability of Part 43 to include experimental aircraft and to require that they be inspected in accordance with Part 91. Applying such restrictions would be contrary to the intent of the amateur-built aircraft program, which is fabricating and assembling an aircraft for educational or recreational purposes. In addition, many exhibit and air-racing aircraft are ex-military aircraft and applying Parts 43 and 91 to them would be excessively restricted on their owners.

One commenter expressed his belief that an advisory circular giving inspection guidelines is needed. While advisory material is going to be released concerning these amendments, no inspection guidelines advisory circular is planned. Appendix D of FAR Part 43 is considered to be adequate.

One commenter suggested that an airworthiness certificate be renewed by an FAA inspector or a certificated mechanic holding an inspection authorization if there is a lapse in the recurring condition inspections to prevent the sale of an unsafe aircraft to an unsuspecting person. Such a provision in the regulation is not needed. The operating limitations will not permit flight of an aircraft unless during the previous twelve months it has been inspected and found to be in safe condition.

Several commenters suggested that the repairman certificate be issued only after the aircraft has flown off its initial restriction. While it is anticipated that the certificates will be issued at this time, such a decision is being retained as a matter for policy determination. One commenter also wanted to

require that the owner be in possession of the applicable service manuals and plans before repairman certification. Since some amateur-built aircraft do not even have plans, such a regulation is not considered appropriate.

Two commenters made proposals, neither of which is related to the rule changes proposed in Notice 79-4. One suggested that an experimental certificate be converted to a standard airworthiness certificate after a specified period or satisfactory operation and inspection. The FAA cannot accept this proposal. Standard category airworthiness certificates are issued only after an exacting and detailed finding that the design meets specific regulatory requirements. The mere operation of an experimental aircraft with limited inspections falls far short of the detailed compliance findings required for issuance of a standard airworthiness certificate.

The other commenter proposed to amend Section 21.191 to permit the issuance of experimental certificates for the purpose of operating certain nonstandard aircraft for recreation. A similar proposal by that commenter in the form of a petition for rule making has already been denied.

Adoption of the Amendment

Accordingly, Parts 21 and 65 of the Federal Aviation Regulations (14 CFR Parts 21 and 65), are amended effective September 10, 1979.

(Sections 313(a), 601, and 602 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, and 1422; sec. 6(c) of the Department of Transportation Act 49 U.S.C. 1655(c)).

Note -- The Federal Aviation Administration has determined that this document involves a regulation which is not considered to be significant under the procedures and criteria prescribed by Executive Order 12044 as implemented by Department of Transportation Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). A copy of the Final Regulatory Evaluation is filed in the Public Docket.

Copies of this evaluation may be requested from Raymond E. Ramakis, Regulatory Projects Branch, AVS-24, Safety Regulations Staff, Federal Aviation Administration, 800 Independence Ave., S.W., Washington, D.C. 20591; Telephone (202) 755-8716.

Amendment 21-50

Technical Standard Order (TSO) Revision Program

Adopted: June 2, 1980 Effective: September 9, 1980

(Published in 45 FR 38342, June 9, 1980)

SUMMARY: The purpose of these amendments is to adopt a new public procedure to expedite the issuance of standards, known as Technical Standard Orders (TSO), for specified materials, parts, processes, and appliances used on civil aircraft. In accordance with Executive Order 12044, Improving Government Regulations, the new procedure will expedite TSO issuance and amendment, and will result in the substantial reduction of existing regulatory material. Consistent with the President's goal of reforming the regulatory process to eliminate unnecessary requirements, these amendments will enable the FAA to issue and amend TSO's in a timely manner. In addition, it is part of the FAA's continuing effort to simplify the Federal Aviation Regulations. The expeditious issuance of new TSO's and amendment of existing TSO's (presently published as Subpart B of Part 37) are necessary to stay current with the continuing growth and technological advances in aeronautics.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION:

Background

Whenever a material, part, process, or appliance is to be used on an aircraft, it must be approved under the Federal Aviation Regulations (FAR) before it can be utilized. The approval can be obtained in one of the following ways: (1) under a Parts Manufacturer Approval issued under 14 CFR 21.303; (2) in conjunction with type certification procedures for a product, including approvals granted by supplemental type certificate; (3) under a Technical Standard Order authorization or approval issued under 14 CFR Part 37; or (4) in any other manner approved by the Administrator.

One of the several methods of obtaining approval is by designing and testing the article (material, part, process, or appliance) in accordance with a TSO which contains minimum performance and quality control standards for specified articles. The standards for each TSO are those the Administrator finds necessary to ensure that the article concerned will operate satisfactorily. Since compliance with a TSO is only one method of obtaining an approval, the standards contained in the TSO are not mandatory but are only an optional way of obtaining approval for a particular article. For example, an applicant can obtain approval to deviate from a particular TSO if it shows that the design features provide an equivalent level of safety.

A TSO is not a standard of general or particular applicability designed to implement or prescribe law or policy. It does not fall within the definition of "rule" contained in the Administrative Procedure Act (5 U.S.C. 551). There is no requirement that a TSO be published as a notice of proposed rule making in the Federal Register.

Future TSO's will, through incorporation by reference, make maximum practical use of "voluntary standards" as defined by the Office of Management and Budget (OMB) Circular A-119, "Federal Participation in the Development and Use of Voluntary Standards," issued January 17, 1980 (45 FR 4326). By definition of OMB Circular A-119, "voluntary standards" are established generally by the private sector "voluntary standards bodies" and are available for use by any person or organization, private or government. The term includes what are commonly referred to as "industry standards" as well as "consensus standards" but does not include professional standards of personal conduct, private standards of individual firms, or standards mandated by law. "Voluntary standards bodies" are nongovernmental bodies which are broad based, multimember, domestic, and multinational organizations including, for example, nonprofit organizations, industry associations, and professional technical societies which develop, establish, or coordinate voluntary standards.

The FAA has determined, for the reasons stated in Notice 79-15, published in the Federal Register on October 1, 1979 (44 FR 56370), that, in the interest of safety, it is appropriate to adopt new public procedures to facilitate the issuance of TSO's for specified articles used on civil aircraft. The safety aspect of this rule making is particularly important. The fact that TSO's have been part of the complex regulatory structure of the FAA has caused a substantial lag time between regulations and state of the technology. This procedural change should advance by months and even years the implementation of technological improvements in the U.S. aviation system.

Interested persons have been afforded an opportunity to participate in the making of these amendments, and due consideration has been given to all matters presented. Significant comments received in response to Notice 79-15 are discussed below. A number of substantive, editorial, and clarifying changes have been made to the proposed rules based on relevant comments and on further review within the FAA. Except for minor editorial and clarifying changes and the changes discussed below, these amendments and the reasons for their adoption are the same as those contained in Notice 79-15.

These amendments are consistent with the agency's responsibility to review the continuing need for regulations and the need to eliminate unnecessary regulations. By eliminating TSO's from the regulations, previously published as Subpart B of 14 CFR Part 37, and making them available through the multiple procedures described below, the FAA has improved the availability of the TSO's and made it easier for the public to locate the most

up-to-date standard. In addition, by removing TSO's from the agency's regulatory process, the time available for other matters within the regulatory system will be increased. This will enable the agency to respond in a more timely manner to other issues submitted by the public. This improvement of the regulatory process, to be more responsive to the public, is consistent with Executive Order 12044, issued by President Carter on March 23, 1978.

Discussion of Comments

Twenty-two individual sets of public comments were submitted in response to Notice 79-15. Several of the commenters were associations that presented the views of manufacturers, operators, and pilots. While the great majority of the commenters were in general agreement with the objective of the proposal, a number of them suggested changes, requested clarification or guidance, and offered specific criticisms. Other commenters proposed changes that are beyond the scope of this rule making.

Discussion of Comments to the New Public Procedure

In general, the commenters concerned themselves with the following questions: How would TSO authorizations be obtained? Would foreign countries accept them? How would a request for approval to deviate from any performance standard be handled?

How would an interested party request a revision to a TSO? How would a current TSO be affected when a revision to the TSO is made? How would the public comment on a draft TSO? How would the FAA revise the sections of the Federal Aviation Regulations which reference a TSO by TSO number? One commenter expressed concern that adopting the proposal would abolish existing TSO's.

Based on comments received, the FAA has determined that the proposed new public procedure may not have been fully understood as it was explained in Notice 79-15. The purpose of the new public procedure is to expedite the issuance of TSO's for specified articles used on civil aircraft by deleting unnecessary rulemaking steps and by deleting unnecessary material from the regulations. This effort is consistent with Executive Order 12044. There is no change in the requirements for the issuance of TSO authorizations which are relocated from Subpart A of Part 37 to new Subpart O of Part 21. There is no change in the procedure to issue TSO authorizations, to process requests for approval to deviate from any performance standard, or to request a revision to a TSO. Existing holders of TSO authorizations will continue to retain their current status when new or amended TSO's are issued, unless otherwise specified in the TSO. Manufacturers may request approval to deviate from any TSO using the same procedures as before, now described in new Section 21.609.

The new public procedure does not affect the right of the public to comment on a proposed TSO. The public will continue to

be invited to participate in the development of documents prepared and issued by industry organizations which the FAA will use by reference in a TSO. The FAA will use the rulemaking process to revise the sections of the Federal Aviation Regulations which reference a TSO by TSO number when there is a need to change the referenced TSO number. The FAA will make available to any interested person an index of each current TSO and each TSO the FAA anticipates will be issued within the succeeding 12 months. The FAA will also invite comments from interested persons on each proposed TSO using a notice in the Federal Register.

Public Procedure

The following is the public procedure, in detail, the FAA will use to develop and issue final TSO's for specified articles used on civil aircraft:

- The FAA will continue to develop draft TSO's and will continue to use, by reference in the TSO, documents prepared and issued by organizations such as the Radio Technical Commission for Aeronautics (RTCA) and the Society of Automotive Engineers (SAE). Notices of RTCA meetings and invitations will continue to be published in the Federal Register. This will allow public participation at the early stages of document development.

- Any interested person may request the Administrator to revise or issue a new TSO by submitting a description of the revision sought or a description of the new article for which a TSO is requested.

- The FAA will use several methods to ensure that the public is afforded early opportunities to take part in the TSO decisionmaking process. A draft TSO will be circulated for public comment through the use of mailing lists. Any individual or organization can request to be placed on the TSO mailing list. All those on the list will receive drafts of each TSO. In addition, Advisory Circular 20-110, Index of Aviation Technical Standard Orders, will list those TSO's the FAA anticipates will be issued within the succeeding 12 months. Advisory Circular 20-110 will also list each current TSO and provide information on how to obtain copies of those desired. Finally, the FAA will publish periodically a notice in the Federal Register of each proposed TSO and provide notice of how to obtain a copy.

- Any individual or organization wishing to obtain copies of Advisory Circular 20-110, specific draft TSO's, or all such TSO's proposed by the FAA may be placed on a mailing list by submitting a request addressed to the Federal Aviation Administration, Office of Airworthiness, Aircraft Engineering Division, Systems Branch (AWS-130), 800 Independence Avenue, S.W., Washington, D.C. 20591, or by telephoning (202) 426-8395. Interested persons will receive copies of the

Advisory Circular and copies of those draft TSO's requested. Any person wishing to submit comments on a proposed TSO will be given 90 days from its issuance date to submit comments.

- All comments received on or before the closing date for comments will be considered by the Administrator before issuing a final TSO.

- All comments submitted will be available, both before and after the closing date for comments, for examination by interested persons in Room 335, FAA Headquarters Building (FOB-10A), 800 Independence Avenue, S.W., Washington, D.C. 20591, between 8:30 a.m. and 5:00 p.m.

- Copies of the final TSO will be mailed to all persons on the mailing list. As in the past, documents prepared and issued by an organization that are incorporated by reference in the TSO will continue to be available to any interested person only from that organization. Final TSO's will not be published in the Federal Register.

- Copies of all draft and final TSO's will also be available at FAA Headquarters in the Office of Airworthiness, Aircraft Engineering Division, Systems Branch (AWS-130), and at all regional Flight Standards Engineering and Manufacturing offices.

In **SUMMARY**, the new procedure has numerous opportunities for the public to participate in the development of each TSO. These are: (1) participation in the development of documents prepared and issued by industry organizations, which the FAA may use by reference in a TSO; (2) mailing lists to circulate a draft TSO to the public for comment; (3) an advisory circular to list for the public each TSO the FAA anticipates will be issued within the succeeding 12 months; (4) notice in the Federal Register announcing the availability of each draft TSO and invitation for comment; and (5) at least 90 days to submit comments.

Discussion of General Comments

One commenter recommended tightening the TSO requirements, citing three airplane incidents (the loss of a piece of tail, the loss of a wing flap, and the failure of a rear bulkhead). This amendment does not address the requirements of any individual TSO. Furthermore, TSO authorizations are not issued for the airframe parts that the commenter cited. FAA approval for these airframe parts is accomplished under the type design approval for the specific airplane.

One commenter cited TSO references in Sections 91.24(a), 91.52, and 121.360 and questioned if the FAA plans to revise these sections to delete the referenced TSO. The FAA is not revising the referenced TSO in these sections. Since Part 37 is being revoked by this amendment, references to TSO's using sections of Part 37 (Section 37.XXX) are revised to reference

each TSO by the TSO number.

One commenter stated that there may be problems relating to the enforcement of the provisions of Advisory Circular 20-110 under proposed Sections 21.603(a), 21.607(a), 21.609, and 21.611.

It is unclear to what this commenter is referring since the advisory circular merely lists each current TSO and each TSO the FAA anticipates will be issued within the succeeding 12 months.

Discussion of Comment to Section 11.49(b)

Present Section 11.49(b)(2) delegates authority to the Director, Flight Standards Service, to issue, amend, and repeal TSO's under Part 37. The notice proposed deletion of this delegation since Part 37 is being revoked. No unfavorable comments were received on the proposal. Accordingly, the proposal is adopted without change. However, it should be noted that the current FAA official responsible for TSO's is the Director of Airworthiness.

Discussion of Comments to Section 21.3

Two commenters pointed out that Section 21.3 contained most of the requirements of proposed Section 21.617 and suggested deleting requirements in proposed Section 21.617 that are duplicated in Section 21.3. The FAA agrees and comments to proposed Section 21.617 are discussed under Section 21.3. Section 21.617 adopted by this amendment relates to a different subject than that of proposed Section 21.617 which is discussed under Section 21.617.

One commenter suggested revising proposed Section 21.617(a) and (b) to require mechanical reliability reporting of TSO articles (currently required for Parts 121, 127, and 135 operators) for Part 91 operator or owners. The commenters cited greater user awareness of such problems for justification. Because the FAA is currently reviewing the entire mechanical reliability reporting program and the issue will be addressed at a later date, the suggestion was not adopted.

Another commenter asked if imported articles would be exempt from the reporting requirements of proposed Section 21.617. Section 21.3(d)(2) does exempt foreign manufacturers from the reporting requirements of Section 21.3(a) because there are existing means by which the FAA obtains the necessary information from the appropriate airworthiness authorities in the country of manufacture. As a result of the information provided by the foreign authorities, it is not necessary to apply the requirements of Section 21.3(a) to foreign manufacturers.

Another commenter suggested removing the phrase "After January 3, 1971" from proposed Section 21.617(a) and (b). Based on these comments and upon further consideration, the FAA has amended Section 21.3(a), (b), (d), and (e)(3)(ii) to make them

applicable to holders of a TSO authorization, relocated proposed Section 21.617(f) to new Section 21.3(f), deleted the phrase "After January 3, 1971," from Section 21.3(a) and (b), and deleted proposed Section 21.617.

Discussion of Comments to Subpart O of Part 21

No unfavorable comments were received on the proposal to amend Section 21.305(b) or on proposed Sections 21.609, 21.611, 21.613, 21.615, 21.619, and 21.621. Accordingly, these proposals are adopted without substantive change.

One commenter suggested deleting Section 21.305(d) and amending Section 43.7 to specify that any alteration or major repair approvals granted under Part 43 be limited to the specific aircraft (by type and serial number) upon which work is performed. The commenter stated that the provisions of Section 21.305(d) in conjunction with discretionary functions of Section 43.7 would "administratively lead to arbitrary and capricious application of subjective standards." No proposal was made in Notice 79-15 to amend Sections 21.305(d) and 43.7 as suggested by the commenter. Furthermore, since the FAA does not have sufficient information at the present time to justify such amendments to Sections 21.305(d) and 43.7, the suggestion is not adopted.

One commenter suggested placing the TSO procedural requirements under Subpart K instead of proposed Subpart O and questioned the need for the proposed new Subpart O. Relocation of the procedural requirements of Subpart A of Part 37 in new Subpart O, as proposed, would retain the same paragraph format subdivisions which are easy to read and use. This would make the regulations easier to use for all members of the public. Therefore, these requirements are relocated in Subpart O.

One commenter suggested that TSO authorizations be transferable. The FAA does not agree. TSO authorizations are not transferable like type certificates because authorizations are issued based on the person's quality control system and ability to duplicate the article under the TSO system.

Section 21.601

No unfavorable comments were received on proposed Section 21.601. However, the FAA is adopting an amendment to Section 21.601 by adding paragraph 21.601(c) which states that the Administrator does not issue a TSO authorization if the manufacturing facilities for the product are located outside of the United States, unless the Administrator finds that the location places no undue burden on the FAA in administering applicable airworthiness requirements. This additional requirement is necessary to ensure that proper surveillance can be maintained over the manufacturer's facilities. The need to impose this restriction is based upon the type of surveillance necessary over a manufacturer having a TSO authorization. It is

identical to the restriction placed upon manufacturing facilities to which type certificates are issued in accordance with Section 21.43 and to which production certificates are issued in accordance with Section 21.137 and reflects current practice. A new Section 21.617 is adopted to address current practices for approving foreign-manufactured articles designed to TSO performance standards. The procedures of new Section 21.617 provide an equivalent to the domestic TSO authorization.

Section 21.603

One commenter objected to proposed Section 21.603(b) which continues to allow the holder of an FAA letter of acceptance of a statement of conformance, issued for an article before July 1, 1962, to continue to manufacture that article without obtaining a TSO authorization. The commenter stated that this establishes different levels of safety for the same product because it allows a product to continue to be manufactured under obsolete standards when that product could not meet current standards. Holders of such letters must comply with the requirements of Sections 21.607 through 21.615, 21.619, and 21.621. In general, when an application for TSO authorization is made, the applicable standards for the article are those in effect on the date of application. The FAA did not propose to revise Section 21.603(b) to withdraw letters of acceptance issued before July 1, 1962, or any TSO authorization issued after July 1, 1962, and to require all manufacturers to demonstrate compliance with the current TSO performance standards. No unfavorable comments were received on the proposal to relocate the substance of Section 37.3 to new Section 21.603. Accordingly, the proposal is adopted without substantive change.

Section 21.605

One commenter recommended revising proposed Section 21.605(a)(2) to require one copy of the technical data required in the applicable TSO issued by the Administrator unless additional copies are requested by the Administrator. The FAA agrees this would reduce the number of copies of the technical data the applicant would need to submit. Another commenter suggested revising the last sentence of proposed Section 21.605(a)(3) to add the phrase "or numbers (or combinations thereof)" between the words "letters" and "will." The commenter stated this would allow the use of suffix numerals as well as letters to designate minor changes to TSO articles. The FAA agrees. After further review, the FAA has determined that the use of part numbers in proposed Sections 21.605(a)(3) and 21.611(a) to identify minor design changes would simplify and expedite approval of such changes. This is consistent with Executive Order 12044 in that it lessens the regulatory burden on the public. Accordingly, Section 21.605 is adopted with the noted changes.

Section 21.607

One commenter suggested deleting proposed Section 21.607(d)(3) because the required weight information is not necessary as a part of the nameplate and it is provided elsewhere. The FAA agrees. Section 21.607(d)(3) is deleted and Section 21.607(d) is renumbered. The same commenter recommended amending proposed Section 21.607 to list the required data and information currently listed in the performance standards of each TSO to further simplify the TSO system. The FAA has determined that since the data and information listed in each TSO are not common to all TSO's, the recommendation, if adopted, would impose unnecessary requirements on some TSO authorization holders. Accordingly, proposed Section 21.607 is adopted without substantive change.

Issue of Letters of TSO Design Approval: Import Appliances New Section 21.617

In order to implement the requirements contained in Sections 21.601(b)(2), 21.603(d) and 21.609(b), the FAA is adopting procedural requirements which reflect current practice for the issuance of letters of TSO design approval for import appliances (see discussion of Section 21.601). New Section 21.617, which is totally different in subject from proposed Section 21.617 (see Section 21.3), prescribes the procedural requirements and, as adopted, Sections 21.601(b)(3), 21.603(a), and 21.609(b) are revised to address foreign manufacturers. These procedural requirements reflect the current practice. Adopting this procedure causes no burden on any person and it has the benefit of formalizing the current practice. The FAA finds that notice and public procedure are unnecessary.

NOTE: This rule contains provisions for the issuance of a TSO authorization and a letter of TSO design approval. To differentiate, a TSO authorization is limited to manufacturers of articles (materials, parts, processes, or appliances) located in the United States. These manufacturers must comply with the requirement to submit quality control system data in addition to certifying that their design complies with the pertinent TSO. Conversely, a letter of TSO design approval is processed under the provisions of airworthiness bilateral agreements and is limited to appliances as defined in pertinent airworthiness bilateral agreements. Such approvals do not require submitting quality control data. The quality control integrity of these appliances is attested to by the Certificate of Airworthiness for Export issued by the civil airworthiness authority of the country of manufacture under the provisions of Section 21.502.

NOTE: Any article approved under an FAA TSO authorization (domestic) or under a letter of TSO design approval (foreign) only attests to the conformity of the design and quality of the particular article against the TSO performance and quality control standards. It does not convey an installation approval. Accordingly, installation approval must be obtained in a manner acceptable to the Administrator for each particular product on which the article is to be installed. This is not a change in

existing practice.

Discussion of Comments to Part 37

One commenter suggested revoking only Subpart B of Part 37. The FAA has determined that there is benefit in having all of the certification procedures for products and parts in Part 21 of the Federal Aviation Regulations. Accordingly, the proposal to revoke Part 37 is adopted without change.

NOTE: There is no change in reporting and/or recordkeeping requirements which are relocated from Subpart A of Part 37 to new Subpart O of Part 21.

Adoption of the Amendments

Accordingly, Parts 11, 21, 25, 29, 37, 91, 121, 127, and 135 of the Federal Aviation Regulations (14 CFR Parts 11, 21, 25, 29, 37, 91, 121, 127, and 135) are amended, effective September 9, 1980.

(Sections 303(d), 313(a), 601, 603, and 605, Federal Aviation Act of 1958, as amended (49 U.S.C. 1344, 1354(a), 1421, 1423, 1424, and 1425; Section 6(c), Department of Transportation Act (49 U.S.C. 1655(c)).)

NOTE: The FAA has determined that this document involves regulations which are not considered to be significant under the procedures and criteria prescribed by Executive Order 12044 and as implemented by the Department of Transportation Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). A copy of the final evaluation prepared for this action is contained in the regulatory docket. A copy of it may be obtained by contacting the person identified under the caption "FOR FURTHER INFORMATION CONTACT."

Amendment 21-51

Airworthiness Review Program - Amendment No. 8A: Aircraft, Engine, and Propeller Airworthiness, and Procedural Amendments

Adopted: August 27, 1980 Effective: October 14, 1980

(Published in 45 FR 60154, September 11, 1980)

SUMMARY: These amendments to the Federal Aviation Regulations update and improve the airworthiness standards applicable to the type certification of aircraft, engines, propellers, related operating rules, and procedural requirements. These amendments are part of the Airworthiness Review Program.

FOR FURTHER INFORMATION CONTACT:

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SUPPLEMENTARY INFORMATION:

These amendments are the ninth and last in a series of amendments issued as part of the Airworthiness Review Program. The following amendments have previously been issued as part of this program:

Title	Federal Register (FR) citation
Amendment No. 1: Form Number and Clarifying Revisions	(40 FR 2576; Jan. 14, 1975).
Amendment No. 2: Rotorcraft Anticollision Light Standards	(41 FR 5290; Feb. 5, 1976).
Amendment No. 3: Miscellaneous Amendments	(41 FR 55454; Dec. 20, 1976).
Amendment No. 4: Powerplant Amendments	(42 FR 15034; March 17, 1977).
Amendment No. 5: Equipment and Systems Amendments	(42 FR 36960; July 18, 1977).
Amendment No. 6: Flight Amendments	(43 FR 2302; Jan. 16, 1978).
Amendment No. 7: Airframe Amendments	(43 FR 50578; Oct. 30, 1978).
Amendment No. 8: Cabin Safety and Flight Attendant Amendments	(45 FR 7750; Feb. 4, 1980).

These amendments are for the most part based on Notice 75-31 which was published in the FEDERAL REGISTER on July 11, 1975 (40 FR 29410), as well as a number of proposals contained in the following notices of proposed rule making: Notice 75-10 (40 FR 10802; March 7, 1975); Notice 75-19 (40 FR 21866; May 19, 1975); and Notice 75-26 (40 FR 24802; June 10, 1975). Amendments based on the latter three notices have already been issued as part of the Airworthiness Review Program, specifically those titled Miscellaneous Amendments, Powerplant Amendments, and Airframe Amendments, respectively. Final action on certain of the proposals was deferred, however, at the time the amendments were issued as further consideration and review of these proposals was considered necessary. In other cases, final action was deferred so that they could be considered together with related proposals contained in other notices.

Certain proposals identified as Group 2 in Appendix I to Notice 75-31 were deferred to be dealt with in a later notice as a part of the Airworthiness Review Program. These proposals all addressed the concept of periodically updating the certification basis of airplane models in long-term production. Such recertification every five or ten years would be intended to ensure that the level of safety of all airplanes in service keep

pace with the current level of safety expectations. The FAA has now determined that these proposals more appropriately should be examined as a separate issue in a future regulatory action. Accordingly, the proposals identified as Group 2 in Appendix 1 to Notice 75-31 are being dropped from the Airworthiness Review Program.

Proposals relating to cabin safety and flight attendants, which are identified in this amendment, were extracted from Notice 75-31 (40 FR 29410; July 11, 1975) and handled on an expedited basis. Those rules were published in the Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Interested persons have been given an opportunity to participate in the making of these amendments and due consideration has been given to all matters presented. The proposals and comments are discussed below. Substantive changes and changes of an editorial and clarifying nature have been made to the proposed rules based upon relevant comments received and further review within the FAA. Except for minor editorial and clarifying changes and the substantive changes discussed below, these amendments and the reasons for them are the same as those contained in Notices 75-10, 75-19, 75-26, and 75-31.

DISCUSSION OF COMMENTS

The following discussions are keyed to the like-numbered proposals contained in Notices 75-10, 75-19, 75-26, and 75-31, and are presented in the same order as the corresponding amendments found in the rules portion of this document.

Proposal 8-1. The proposal to amend Section 1.1 in order to transfer the definitions for rated power and thrust to a new Section 33.6 is withdrawn. It is considered that such a change may introduce confusion in the administration of aircraft certification rules. See also Proposal 8-94.

Proposal 8-2. Several commenters object to proposed Section 21.16(a) which would delete reference to a "novel and unusual design feature" as a necessary condition for the Administrator to issue special conditions. Special conditions become a part of the designated applicable regulations for type certification of a particular product (aircraft, aircraft engine, or propeller).

One commenter indicates that the proposed revision is unjustified and would lead to indiscriminate rule making, and that instead of simplifying the administration of the requirements it would introduce complexity. Another commenter claims that adoption of proposed Section 21.16(a) would introduce uncertainty into design requirements.

One commenter suggests that in lieu of revising Section 21.16, the FAA should perform a study of Section 21.21(b)(2). (Section 21.21(b)(2) provides for denial of a type certificate if an unsafe feature or characteristic exists in the design under

consideration. Before adoption of Section 21.16, FAA used Section 21.21(b)(2) to issue special conditions in letter form.) This commenter suggests that if Section 21.21(b)(2) were to continue to be used to issue special conditions to cover an unsafe design feature or characteristic that is not "novel or unusual," it must be equally applicable to a condition that exists on more than one (earlier certificated) product, further stating that the other product or products must then have been type certificated using existing rules which did not adequately

cover the unsafe design feature or characteristic. On this premise, the same commenter asks several relevant questions. When Section 21.21(b)(2) is applied, does the FAA make it retroactive to the other involved models? Are Airworthiness Directives (Part 39) issued? Why wasn't a special condition issued against the first applicant when the condition was, in fact, novel or unusual? Why was this not followed by a notice of proposed rule making for future application?

These comments and questions caused the FAA to completely reevaluate its practices in designating the applicable regulations for type certification under Section 21.17(a), commonly referred to as defining a "type certification basis."

After further consideration of the comments received as well as FAA practice in designating the applicable regulations, and the objectives of proposed Section 21.16, the FAA agrees that this proposal should be withdrawn because of the potential for possible abuse of general rulemaking procedures, of the requirements of the Administrative Procedure Act, and the intent of Executive Order 12044. As explained below, the objectives of proposed Section 21.16 will be satisfied by the application of a new FAA policy affecting the designation of applicable regulations for the type certification of new aircraft, aircraft engines, and propeller designs. These future practices are consistent with the FAA General Rule-Making Procedures of Part 11, the Administrative Procedure Act, and Executive Order 12044.

Section 21.16 is one paragraph of a number of paragraphs used to define the type certification basis of a new product. Companion paragraphs of importance to this discussion include Sections 21.17 and 21.21. Section 21.17(a) provides that the applicable airworthiness standards are (1) those requirements of this subchapter that are effective on the date of application for a type certificate, unless otherwise specified by the Administrator or unless compliance with later effective amendments is elected by the applicant or required by special retroactive regulations (e.g., Section 25.2), and (2) any special conditions prescribed by the Administrator in accordance with Section 21.16. Section 21.16 provides for the issuance of special conditions when the Administrator finds that the existing airworthiness standards do not contain adequate or appropriate safety standards because of novel or unusual design features of the product to be type certificated. Section 21.21(b)(2) permits noncompliance with specific provisions of the airworthiness

standards when there are compensating factors that provide an equivalent level of safety. Such determinations are commonly referred to as "equivalent safety findings." Section 21.21(b)(2)

provides for the denial of a type certificate, notwithstanding a showing of compliance with the applicable airworthiness standards designated in accordance with Section 21.17, if the Administrator finds an unsafe feature or characteristic of the product for the category in which certification is requested.

Sections 21.16, 21.17, and 21.21, taken together with FAA policy in designating the applicable regulations must recognize and balance four important considerations: (1) the FAA has an obligation under Section 601 of the Federal Aviation Act of 1958 to keep the airworthiness standards of this subchapter (i.e., FARs 23, 25, 27, 29, 31, 33, and 35) as current as practicable; (2) the type certificate applicant has a right and a need to know, in very specific terms, what the applicable airworthiness standards will be in order finalize the detail design of its product and to enable the applicant to make reasonable performance guarantees to its potential customers; (3) in the interests of safety, rapid technological advances presently being made by the civil aircraft industry require that the FAA be able to issue special conditions to address truly novel or unusual design features that it has, as yet, not had an adequate opportunity to envisage in the airworthiness standards through the general rulemaking process; and (4) because the airworthiness standards of this subchapter are intentionally objective in nature to allow flexibility in design, the FAA must retain the prerogatives both to make equivalent safety findings and to deny a type certificate whenever an unsafe design feature or characteristic is found during the type certification process.

The phrase "novel or unusual" as used in Section 21.16 is a very relative term. As used hereafter in applying Section 21.16 to justify the issuance of special conditions, "novel or unusual" will be taken with respect to the state of technology envisaged by the applicable airworthiness standards of this subchapter. It must be recognized that in some areas which will vary from time to time the state of the regulations may somewhat lag the state of the art in new design because of the rapidity in which the state of the art is advancing in civil aeronautical design and because of the time required to develop the experience base needed by the FAA to proceed with general rule making. Applicants for type certification of a new design have the opportunity to mitigate the impact of not knowing the precise airworthiness standards to be applied for "novel or unusual design features" by consulting with the FAA early in their certification planning when such features are suspected or known by the applicant to exist. It should also be recognized that, because of the intentional objective nature of the airworthiness standards of this subchapter, many new design features which might be thought

of as "novel or unusual design features" may already be adequately covered by existing regulations, thus obviating the

need to issue special conditions.

Henceforth, the special condition will not be issued for general upgrading of the applicable airworthiness standards when novel or unusual design features are not involved. Whenever the FAA determines that an upgrading of the airworthiness standards of this subchapter is warranted, the upgrading will be promulgated as an amendment to this subchapter consistent with the general rulemaking procedures of FAR Part 11, the Administrative Procedure Act, and Executive Order 12044. Should the FAA conclude that there is a compelling safety need to apply a proposed amendment retroactively to designs already type certificated or to designs for which a type certificate application is in progress, the retroactive aspects of the proposed amendment, if supportable by a regulatory analysis completed in accordance with Executive order 12044, will be announced in the notice or proposed rule making for that amendment. Public comments on the proposed retroactive aspects will be considered in determining the applicability of the adopted rule.

A number of products for which special conditions have not as yet been issued are undergoing type certification at the time of this amendment. Should the FAA conclude that recent or future amendments to this subchapter should be applied to these products that would not otherwise be applicable under Section 21.17(a)(1) then an amendment to require retroactive application will be proposed and acted upon through the general rulemaking process explained above, in lieu of issuing special conditions under Section 21.16.

Also, the provisions of Section 21.21(b)(2) will no longer be used to justify the issuance of special conditions. However, just as an Airworthiness Directive may be issued under Part 39 to require the correction of an unsafe condition that is likely to exist or develop in a product of the same type design, notwithstanding a showing of compliance with the applicable airworthiness standards, Section 21.21(b)(2) may continue to be used to deny issuance of a type certificate if a similar unsafe feature or characteristic is found during the type certification process, notwithstanding a showing of compliance with requirements designated by Section 21.17. The unsafe features and characteristics envisaged by Section 21.21(b)(2) are those related to specific design configuration or product characteristics of a particular design, that one would not normally expect the applicable airworthiness standards to

specifically preclude because of their intentionally objective nature.

It is the practice of the FAA to develop and publish a Type Certificate Data Sheet as an integral part of each type certificate. The type certification basis is recorded on the Type Certificate Data Sheet for public information. In the future the type certification basis statement will identify not

only the applicable regulation, including special conditions, but also will identify all exemptions issued pursuant to Part 11, together with "equivalent safety findings" made in accordance with Section 21.21(b)(1).

For the above reasons, Proposal 8-2 is withdrawn.

In considering its disposition of the proposal to amend Section 21.16(a), the FAA realizes that a "novel or unusual design feature" today may become a common design feature of the future. The issuance of a like special condition for several product designs will most likely compel general rule making on that subject and the history of that special condition could have a very strong influence on thinking when general rule making is initiated. Also, although special conditions are regulations of particular product applicability, they are issued only in the interest of public safety. For these reasons, Part 11, and Section 21.16 of Part 21 are amended to require special conditions to be issued in accordance with the existing general rule-making procedures. As is now the case, a docket will continue to be maintained for each set of special conditions, and all material in the docket will continue to be available for public review.

Proposal 8-3. This proposal is one of a group of proposals dealing with the establishment of Instructions for Continued Airworthiness and the responsibilities of maintenance personnel and aircraft operators with respect to those instructions. The group is made up of the following proposals: 8-3, 8-5, 8-21, 8-25, 8-58, 8-62, 8-64, 8-67, 8-77, 8-80, 8-89, 8-91, 8-92, 8-93, 8-97, 8-98, 8-99, 8-104, 8-106, 8-107, 8-110, and 8-111.

A commenter representing a number of scheduled air carriers objects to the requirement in Section 21.31(c) that the type design include the Airworthiness Limitations section of the Instructions for Continued Airworthiness because of the information to be included in that section. Although this commenter does not object to including mandatory replacement times for life-limited parts in the Airworthiness Limitations section, the commenter strongly objects to including inspection intervals and related procedures. Under proposed Sections 43.16 and 91.163(c), the commenter points out, air carriers would be required to comply with these maintenance-related airworthiness limitations. The FAA does not agree that inspection intervals and related procedures can be omitted from the Airworthiness Limitations section of the Instructions for Continued Airworthiness. For example, the proposed Airworthiness Limitations section on a transport category airplane must contain mandatory inspection intervals and related procedures because the damage-tolerance concept described in Section 25.571 is predicated upon the use of such inspections to detect initial cracks in principal structural elements before crack growth under repeated loads could progress to a degree which would cause catastrophic failure of the airplane. However, the FAA does agree that Sections 43.16 and 91.163(c) should permit

modification of these intervals and procedures by other FAA approved methods. Accordingly, inspection programs approved under Sections 121.25(b), 121.45, 121.367, 123.21(b), 127.13(b), 127.133, 135.5, 135.17, 135.419, 135.421, and 135.425, as defined by approved operations specifications, or an inspection program approved under Section 91.217(e) constitute acceptable alternatives. The appendices to Parts 23, 25, 29, 31, 33, and 35 as adopted in this amendment require the applicant to specify (in the Airworthiness Limitations section) mandatory replacement times, inspection intervals, and related procedures. Sections 43.16 and 91.163(c) have been revised to show that only the inspection times and procedures may be adjusted under approved alternative programs.

A commenter objects to Section 21.31(c), which in general is applicable to manufacturers, since continued airworthiness, which is covered in the paragraph, is the responsibility of the operator. Because this comment pertains more directly to Section 21.50, it is dealt with in conjunction with Proposal 8-5.

In addition to comments relating to the Instructions for Continued Airworthiness, a commenter objects to Section 21.31(a) because the proposal to include a list of drawings and specifications in the type design was not mentioned at the Airworthiness Review Conference. In fact, this proposal did appear as an FAA comment on Proposal No. 565 in the Committee I Workbook (titled "Procedures and Special Subjects") made available to all participants at the conference, and may be found in the docket.

Several commenters object to Section 21.31(d) because including analyses in the type design - (1) would be redundant, since it is already required as part of the substantiating data; (2) is unnecessary, since the drawings and specifications required under current Section 21.31(a) provide the general information needed by the FAA; and (3) introduces the possibility that the FAA would require the manufacturer to provide any and all data used to prepare the drawings and specifications, thereby delaying type certification. The FAA agrees that proposed Section 21.31(d) would serve no useful purpose and it is withdrawn.

Proposal 8-4. A commenter objects that Section 21.35(b)(2) eliminates flight testing for reliability, contending that analysis and ground test are not dependable as a basis for certification. In the light of this comment, and after further consideration and experience, the FAA has determined that flight testing for reliability does provide safety information not necessarily obtainable from analysis and ground test. Accordingly, the proposal to delete the reference to reliability in Section 21.35(b)(2) is withdrawn.

No adverse comment was received on the proposal to replace the word "airplanes" in Section 21.35(b)(2) with the word "aircraft" and this amendment to Section 21.35(b)(2) is adopted

without change.

Proposal 8-5. A commenter objects to the continued airworthiness provisions of Section 21.50(b) (and also proposed Section 21.31(c)) contending that - (1) continued airworthiness is the responsibility of the operator/owner; (2) current regulations in Parts 23 and 25 already require manufacturers to make available recommended maintenance procedures for the product at the time of its delivery; (3) current operating rules require the operator/owner to establish and comply with a maintenance program; and (4) with respect to transport airplanes, the present FAA Maintenance Review Board (MRB) system is an entirely satisfactory way of establishing the means for maintaining airworthiness. Current FAA practice allows operators of new transport category airplanes to utilize FAA MRB recommendations (reference FAA Advisory Circular No. AC 121-22) for starting their maintenance programs, and then vary them with FAA approval as experience and operating conditions dictate. The commenter points out that, contrary to that practice, the amendment will require the manufacturer to obtain FAA approval of its recommended maintenance procedures before the airplane is type certificated, and to obtain FAA approval of revisions to those procedures (necessitated by any improvement change in the airplane) before approval of the change itself. This, the commenter states, will impose a severe and unnecessary hardship on the manufacturer.

On the first and second points, although the operator/owner does have responsibility for continued airworthiness, the FAA has found that the recommended maintenance procedures made available under current regulations are frequently inadequate in scope and content, and often do not provide a sound basis for the operator/owner to maintain the airworthiness of the aircraft. The FAA has concluded that the lack of such recommended maintenance procedures can best be remedied by requiring that they be made available to owners and operators by the type certificate or supplemental type certificate holder. On the third point, while it is true that not all operators/owners are required to establish and comply with a continuous airworthiness program, those that voluntarily wish to set up such a program are often handicapped by the lack of comprehensive instructions, which would be remedied by Section 21.50(b). On the other hand, those required to establish a program will benefit from the more detailed and comprehensive instructions made available to them under Section 21.50(b). On the fourth point, which is directed toward aircraft that will be maintained in accordance with an FAA approved operations specification and maintenance program under Parts 121, 123, 127, 135, or an approved inspection program under Section 91.217(e), the FAA recognizes that these procedures for maintaining airworthiness of the products have functioned satisfactorily. In this regard, the FAA expects that operating segments of the air transportation industry would continue to work with type certification applicants in defining adequate maintenance instructions prior to type certification. The FAA MRB document, which is a product of contributions made by both

the operators and manufacturer, could be picked up by the type design holder and included as part of the required Instructions for Continued Airworthiness, thus continuing the usefulness of the existing MRB practices for the original entry into service of new product designs. Likewise, the additional maintenance instructions that would be required and which are not typical to MRB documents, but are presently required in air carrier operators' FAA approved maintenance programs, could also be picked up by the type design holder. Therefore, the screening process that would be utilized by the FAA in reviewing such maintenance documents would not unnecessarily delay type certification or approval of design changes after certification. See also the discussion under Proposal 8-3.

A commenter questions the need for the provision in Section 21.50(b) requiring that the Airworthiness Limitations section of the Instructions for Continued Airworthiness be furnished with each aircraft, engine, or propeller. The FAA agrees that this provision is unnecessary, as the type certificate holder must make the manual available, and the operator/owner must comply. To require a manual to be furnished with each equipment would be redundant, and in some instances, would be unnecessary. Accordingly, the requirement that the Airworthiness Limitations section be furnished with each airplane or product is revised to require that the section be furnished to each owner of the type.

A commenter objects to Section 21.50(b) insofar as it applies to rotorcraft type certificated under Parts 27 and 29, contending that the manufacturer is already required under those parts to furnish a maintenance manual, which has allegedly been proven adequate. The FAA does not agree. The proposed Instructions for Continued Airworthiness, which are broader in scope and more detailed than the maintenance manual currently required under Parts 27 and 29, would provide the operator/owner with the minimum amount of information needed to maintain the airworthiness of increasingly complex rotorcraft currently being designed.

A commenter suggest that Section 21.50(b) be revised to make it clear that an aircraft manufacturer need not supply Instructions for Continued Airworthiness pertaining to engines and propellers until the complete aircraft is delivered to the first retail purchaser. The continued airworthiness instructions for propellers and engines should be provided to the aircraft manufacturer to facilitate transmittal to purchasers of the aircraft.

A commenter notes that Section 21.50(b) would require an aircraft manufacturer to make the Instructions for Continued Airworthiness available to the owner upon delivery of the aircraft and to any other person required to comply with any of the terms of those instructions upon request. Since such a request could be made before the first aircraft delivery, it could impose an unnecessary burden on the aircraft manufacturer. The commenter suggests that Section 21.50(b) be revised so that

such a request need not be filled until after delivery of an aircraft to the first owner. The FAA agrees that an early request for the Instructions for Continued Airworthiness could impose an unnecessary burden on the manufacturer. Additionally, the FAA notes that airplanes can be delivered to an operator, prior to full type certification, with a provisional airworthiness certificate to allow activities such as crew training, and therefore prior to the approval of the Airworthiness Limitations section. Accordingly, the phrase "upon request" has been deleted from Section 21.50(b) and the language has been revised to require that at least one set of the complete instructions for Continued Airworthiness be furnished upon delivery to the customer, or subsequent to issuance of the first standard certificate of airworthiness, whichever occurs later.

Proposal 8-6. Commenters object to the proposal to make Section 21.97(b) applicable to all products rather than to engines only because - (1) the volume of paperwork would increase out of proportion to any benefits that might be gained; (2) the applications for supplemental type certificates would be significantly more complex, since there are frequently many configuration variations within an aircraft model and a fleet operator would have to list all of the configurations or make separate application for each; and (3) the term "specific configuration" must be defined if the proposal is to be properly administered. In light of these comments and after further consideration, the FAA concludes that this proposal requires additional study and it is withdrawn.

Proposal 8-7. No unfavorable comment was received on the proposal to amend Section 21.123 to require a manufacturer to submit a manual describing its production inspection system and means for controlling materials and parts. Accordingly, the proposal is adopted without substantive change.

Proposal 8-8. A commenter objects to Section 21.143(a)(2) contending that substitution of the word "supplier" for "subsidiary" introduces a major change to the requirements, involving increased paperwork and costs. The FAA does not agree. The FAA has consistently administered Section 21.143(a)(2) as applying to all raw materials, purchased items, parts, and assemblies supplied to the prime manufacturer. The change does not involve increased paperwork or costs because it is a semantic change which clarifies the definition of persons or entities subject to the quality control data requirements of Section 21.143, without expanding any of those requirements. The use of the term "subsidiary" is unclear because it implies that there must be a corporate connection between the prime manufacturer and his supplier. Accordingly, the language has been revised to reflect the FAA's intent that the quality control data requirements of Section 21.143(a)(2) apply to all "suppliers" of each prime manufacturer. For similar reasons and for internal consistency, Section 21.143(b) is revised to replace the term "subsidiary manufacturers" with the term "suppliers".

Proposal 8-9. No unfavorable comment was received on the proposal to amend Section 21.182 to ensure that the proposed new Section 45.11(c) is cross referenced. Accordingly, the proposal is adopted without substantive change.

Proposal 8-10. A commenter raises the question whether a special flight permit issued under Section 21.197(a)(3) would serve as a certificate of airworthiness for international flights. The FAA notes that international flights cannot be conducted under special flight permits issued under Section 21.197 unless specifically authorized by the foreign authorities concerned.

Another commenter objects to Section 21.197(a)(3)(ii) because as worded, the individual aircraft would have to be flown for at least 50 hours, thereby defeating the purpose of the original proposal (as submitted for the Airworthiness Review) which aimed at eliminating unnecessary delays in obtaining FAA approval of customer demonstration flights. The commenter suggests that this provision be changed to stipulate that the aircraft type must have been flown for at least 50 hours. The FAA agrees that since the proposal concerns aircraft manufactured under a production certificate, and since the aircraft type could have been flown for at least 50 hours during the type certification program, the 50 hours of flight provision is not necessary. However, the FAA does not agree with the commenter's suggested revision. It is necessary to require that production flight tests for the individual aircraft involved be satisfactorily completed before that aircraft is flown on customer demonstration flights. Accordingly, Section 21.197(a)(5) is added to prescribe this condition in place of the 50 hours of flight provision.

The same commenter also suggests that Section 21.197(a)(3)(ii) should be made applicable to aircraft produced under a type certificate only, since such aircraft received close production surveillance by the FAA. The FAA agrees that a production certificate should not be the limiting factor in obtaining FAA approval of customer demonstration flights. If the aircraft has been demonstrated to otherwise meet all the safety requirements for a standard airworthiness certificate, then customer demonstration flights could be permitted. This proposal is adopted by the addition of Section 21.197(a)(5).

In addition, the commenter suggests that proposed Section 21.197(a)(3)(ii) be amended with a reference to the maintenance and inspection programs called for under Section 21.195 for Experimental and Subpart C Provisional Type Certificates. Such procedures would unnecessarily complicate the issuance of permits for customer demonstration flights and would in effect nullify the original proposal. The portion of the proposal calling for maintenance and inspection programs in these instances is therefore withdrawn.

Proposal 8-11. No unfavorable comments were received on the

proposal to amend Section 23.253(b)(3) to ensure that high speed buffeting does not become severe enough to prevent the pilot from reading the instruments or controlling the airplane. Accordingly, the proposal is adopted without substantive change. Also see Proposal 8-28.

Proposal 8-12. No unfavorable comments were received on the proposal to amend Section 23.361 to redefine the limit engine torque load conditions to be considered for turbine engine installations and to make other clarifying changes. Accordingly, the proposal is adopted without substantive change.

Proposal 8-13. The FAA does not agree with a commenter who suggests that the lead-in of Section 23.371 be revised to make the gyroscopic load requirements applicable to piston as well as turbine engines. The FAA has no information to indicate a need for coverage of piston engines in this regulation, nor was any submitted by the commenter.

Another commenter concurs with Section 23.371, assuming that a rational analysis of loads under Section 23.371(a) is an alternate to the loads specified in Section 23.371(b). This assumption is correct. No change to Section 23.371 was proposed in this regard. Section 23.371 is adopted without substantive change.

Proposal 8-14. A commenter suggests that the word "operated" in Section 23.729(c) be replaced by the word "lowered". The commenter states that the intent of the rule is to ensure that the gear can be lowered in an emergency. The FAA concurs, but the word "extended" is used to preserve the internal consistency of the section. Section 23.729(c) is revised accordingly.

This commenter also questions whether Section 23.729(e) would require an "up lock". The commenter is evidently referring to a "lock" in the sense of a positive means other than hydraulic pressure, as required to keep the gear extended by Section 23.729(b). Section 23.729(e) contains no such requirement.

Another commenter suggests that the second sentence of Section 23.729(e) be revised to add the words "and secured" after the words "fully extended" and "fully retracted" in order to clarify what functions the lights would indicate to the pilot. The first sentence of the paragraph clearly states that the indicators should inform the pilot that the gear is secured in the extended or retracted position.

A commenter states that the proposal is redundant since the requirement is already in effect. The FAA does not agree. This is one of several new provisions being incorporated into the current regulations to assure the reliability of small land-plane landing gear systems.

After further review, the FAA has determined that the words

"and warning device" should be removed from the heading of Section 23.729(e) to preclude confusion between the requirements of this paragraph and those of Section 23.729(f). Section 23.729 is adopted with editorial changes and the revisions discussed.

Proposal 8-15. A commenter objects to Section 23.903(f) on the grounds that it imposes new and unjustified criteria for restart capability of reciprocating engine powered airplanes. The FAA believes the requirement to be fully justified. Accidents have occurred with multiengine reciprocating powered, as well as turbine powered airplanes because pilots have not been adequately apprised of the engine restart envelope for their airplane. Therefore, the requirement must apply to both types of engine installations.

This commenter further states that Section 23.903(g) is acceptable provided that the "restart requirement is understood to be within the restart envelope for the aircraft (if one is approved for the aircraft)." Present Section 23.903(e)(3), as applicable to turbine engine powered small airplanes, states that it must be possible to restart an engine in flight, and Section 23.903(f) requires that an approved restart envelope be established. Therefore, development of a restart envelope would be required for the approval of each turbine engine powered small airplane. As adopted, Section 23.903(g) requires that, following in-flight shutdown of all engines, electrical power for ignition exists throughout the approved restart envelope.

Another commenter states that it seems inconsistent to require that electrical power be provided for ignition but not for rotational capability sufficient for an engine start. The FAA does not agree. As adopted, the rule provides for those circumstances where engine windmilling speed is sufficient for restarting but insufficient to provide electrical power for ignition.

The proposal is adopted without substantive change. However, Section 23.903(f) is revised to make it clear that the specified in-flight engine restart capability is required throughout the required altitude and airspeed envelope.

Proposal 8-16. No unfavorable comment was received on adding a new Section 23.905(d) referencing propeller blade pitch control system durability requirements. Accordingly, Section 23.905(d) is adopted without substantive change. For discussion of a related proposal to add a new Section 35.42, see the discussion under Proposal 8-103.

Proposal 8-17. A commenter suggests that since the requirement for fuel tanks to retain fuel during a landing with landing gear retracted or collapsed may be subject to individual interpretation, advisory material on compliance methods should be reviewed with industry prior to implementation of the rule. The FAA does not agree. The revision merely clarifies an existing requirement. Section 23.967 is adopted without substantive

change.

Proposal 8-18. A commenter recommends that the proposal to add a new Section 23.991(d) which requires that operation of any fuel pump does not adversely affect continuous engine operation, be withdrawn or its adoption delayed while the compatibility of engine and airplane fuel systems is studied. The compatibility between these systems must be established in the design process, and the relevant design considerations are well known. Delaying the requirement in favor of additional study is not warranted.

Another commenter contends that the requirement is beyond the needs of safety. The FAA agrees that the proposed requirement is too restrictive and Section 23.991(d) is revised to provide that the operation of any fuel pump may not affect engine operation so as to create a hazard.

Two commenters disagree with adding a new Section 23.991(d), contending that it eliminates present fuel system designs. The FAA has no information to suggest that compliance with the revised section, as discussed above, would be impossible using present fuel system designs, nor was any presented by the commenter.

The proposal is adopted with the revision discussed above.

Proposal 8-19. No unfavorable comments were received on the proposal to amend Section 23.1305(n) to permit movement of the propeller blade up to 8 degrees the flight low pitch position before an indication of the movement is required for the flight crew. Accordingly, the proposal is adopted without substantive change.

Proposal 8-20. For comments related to withdrawal of the proposal to revise Section 23.1521(a), see Proposal 8-94.

Proposal 8-21. Since the proposal for Section 23.1529 is substantively identical to those for Sections 25.1529 (Proposal 8-58), 27.1529 (Proposal 8-64), and 29.1529 (Proposal 8-77), all comments on these proposals are considered here.

A commenter notes that although the explanation for Section 23.1529 makes it clear that the Instructions for Continued Airworthiness need not be finalized until delivery of the first airplane, the proposal itself seems to require that they be finalized before type certification. The commenter suggests that this point be clarified. The FAA agrees, and Sections 23.1529, 25.1529, 27.1529, 29.1529, 31.82, 33.4, and 35.4, are revised accordingly.

In response to a commenter representing a group of scheduled air carriers, the FAA notes that, except for the Airworthiness Limitations section, there is no requirement that any operator/owner use the Instructions for Continued Airworthiness referred to in Sections 23.1529, 25.1529, 27.1529 and 29.1529.

Moreover, the new Sections 43.13(a), 43.16, and 91.163(c) allow the use of other methods. In particular, the use of maintenance manuals and continuous airworthiness maintenance programs developed under current Parts 121, 123, 127, and 135, or an inspection program approved under current Section 91.217(e), would be acceptable alternatives to the Airworthiness Limitations section. This commenter suggests that language be added to Section 25.1529 to make it clear that alternatives to the instructions for Continued Airworthiness (except the Airworthiness Limitations section) may be used. This suggestion was not adopted because Sections 43.16 and 91.163(c) make this provision sufficiently clear.

Proposal 8-22, 8-23, and 8-24. Final action on Proposals 8-22, 8-23, and 8-24 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; Oct. 30, 1978).

Proposal 8-25. The proposals to add an appendix to Parts 23, 25, 27, and 29 (Proposals 8-62, 8-67, and 8-80) setting forth Instructions for Continued Airworthiness are substantively identical and are discussed below. Unless otherwise stated, the discussion refers to the designated sections in each of the appendices mentioned above.

Section XX.1(a). A commenter objects to the concept of specifying requirements (as opposed to providing guidance) for the preparation of Instructions for Continued Airworthiness, contending that such requirements would lead to time-consuming negotiations between the manufacturer and the FAA, and that some flexibility in providing the instructions is necessary. The appendix sets forth, in broad objective terms, the kinds of information the Instructions for Continued Airworthiness must contain. Within this framework, the manufacturer would be free to develop detailed instructions appropriate to its aircraft. The FAA is confident that the appendix provides a reasonable measure of flexibility, and anticipates no difficulties or delays in determining the acceptability of the Instructions developed by the manufacturer.

Section XX.1(b). A commenter objects to the requirement that Instructions for Continued Airworthiness be provided for appliances, contending that - (1) this information is often not

available from the appliance manufacturer; (2) even when available, the information sometimes has to be revised for the particular application in a manner not approved or intended by the appliance manufacturer; and (3) the information necessary for customized equipment installations would be unreasonably costly to develop. The FAA does not agree. Such information, which is essential to the continued airworthiness of the aircraft, should be provided for each required product. Accordingly, the language of Section XX.1(b) is revised to make it clear that if the aircraft manufacturer does not supply continued airworthiness instructions for the product, the Instructions for Continued

Airworthiness for the aircraft must include this information. See also the discussion under Section XX.3(a)(5)(i).

A commenter objects to the proposal to include information on engines and all appliances in the Instructions for Continued Airworthiness, contending that (1) such information should be furnished by the engine or appliance manufacturer; and (2) with respect to appliances, only those for which standards have been established by FAA should be covered. On the first point, manufacturers of new engine designs are required to supply the information for their products under new Section 33.4. Manufacturers of new aircraft using currently certificated engines are required by Section XX.1(b) to provide the information for the engine in their Instructions for Continued Airworthiness for the aircraft. In practice, the FAA expects this information to be developed and supplied by the engine manufacturer. A similar requirement for appliances would be administratively impracticable because of the large number involved. On the second point, it should be noted that specific performance and safety standards have not been established for all essential appliances. However, upon further review, the FAA concludes that it would be unreasonable to require the aircraft manufacturer to cover appliances other than those required in applicable regulations. Accordingly, Section XX.1(b), as adopted, refers only to appliances "required by this chapter."

Section XX.2. A commenter suggests a revision of this section to make clear that the Instructions for Continued Airworthiness may consist of a series of volumes, or may be supplied in other than book form, such as on microfilm or microfiche. The language in Section XX.2 is sufficiently broad to cover these acceptable alternatives. Reference to the Air Transportation Association of America Specification No. 100 (where it appeared) is deleted from Section XX.2(b) because it is nonregulatory.

Section XX.3, lead-in paragraph. A commenter objects to the requirement that the contents of the manual "be prepared to be understood by the persons who will be responsible for maintaining" the aircraft or product, contending that - (1) it would impose a subjective standard that would be impossible to meet; and (2) it could be interpreted to mean that, in some circumstances, manuals for aircraft to be exported must be prepared in the language of the country of export. In light of these comments, the first sentence of the lead-in paragraph of Section XX.3, is revised to read as follows: "The contents of the manual or manuals must be prepared in the English language." This conveys the intent of the original proposal. A commenter points out that there may be different levels of maintenance instructions, directed at different classes of operators. For example, the maintenance instructions provided to a fleet operator or commuter airline may be more comprehensive than those provided to a fixed base operator. Any level of maintenance instructions considered appropriate by the manufacturer may be

submitted, provided that those instructions comply with the minimum standards in the appendix.

Section XX.3(a)(2). A commenter recommends that the requirement for complete descriptions be limited in scope to the "standard" aircraft and "quantity-installed" optional equipment, contending that it would be virtually impossible to devise "custom" maintenance manuals for each product because of the many combinations of equipment that may be ordered by the purchaser. In addition, the commenter states that a manual containing all of these combinations would be difficult to use. The FAA does not agree. To achieve its purpose, the Instructions for Continued Airworthiness must contain information on each item of equipment required by regulation to be installed on the aircraft. The FAA notes that supplemental type certificates (STC's) are required for installation of equipment not a part of the type certificate, and that this maintenance manual requirement is equally applicable to the STC applicant.

Section XX.3(a)(3). A commenter recommends that since maintenance personnel have no need for the kind of operating information provided in a Pilot's Operating Handbook, the paragraph be revised to require only basic principles of equipment control and operation. The FAA agrees, and Section XX.3(a)(3) now refers to basic control and operation information.

Section XX.3(a)(5)(i). A commenter recommends that applicants be allowed to refer to a component manufacturer as a source of information instead of including the information in the Instructions for Continued Airworthiness. The commenter argues that many component manufacturers prefer to maintain control of their maintenance information to ensure that it is up to date. In other cases, maintenance at the factory may be required because of the complexity of the equipment. The FAA recognizes that some accessories, instruments, and equipment have an exceptionally high degree of complexity, requiring specialized maintenance techniques, test equipment, or expertise. In such cases, it would be in the interest of safety to allow the applicant to refer to the appropriate manufacturer in the maintenance instructions. The FAA does not agree, however, that such reference should be allowed in other circumstances. Section XX.3(a)(5)(i) (redesignated Section XX.3(b)(1)) is revised accordingly.

A commenter recommends that the last sentence of Section XX.3(a)(5)(i), be revised to allow reference to a separate inspection program, rather than include it in the maintenance instructions, so that the inspection program could be better kept current and also tailored to an individual operator's needs. The FAA does not agree. The inspection program must be set forth in the Instructions for Continued Airworthiness to ensure its availability to those who will benefit from it.

The FAA, after further study of Section XX.3(a)(5)(i), has decided that the provision should specifically require a

description of applicable maintenance or wear tolerances. Section XX.3(a)(5)(i) (redesignated Section XX.3(b)(1)) is clarified in this regard.

Section XX.3(a)(5)(ii). A commenter objects to the words "could occur" in this paragraph because it encompasses everything within the realm of possibility, thereby unnecessarily increasing the volume of the maintenance instructions. The phrase "probable malfunctions" replaces the phrase "typical malfunctions that could occur" in Section XX.3(a)(5)(ii) (redesignated Section XX.3(b)(2)).

Section XX.3(a)(5)(iii). A commenter suggests that this paragraph would be clearer if the first three words and the last five words are deleted. Section XX.3(a)(5)(iii) (redesignated Section XX.3(b)(3)) is revised accordingly.

Section XX.3(a)(5)(iv). A commenter suggests revision of this paragraph to make it clear that the overweight landing check refers to the condition in which a certificated landing weight is lower than certificated takeoff weight, since the aircraft manufacturer cannot speculate what damage might be done to an aircraft that takes off and must immediately land at a weight near the certificated takeoff weight. This comment may have merit for certain aircraft. Moreover, since an overweight landing is but one of several occurrences which would necessitate a check to determine aircraft damage, to single out one occurrence would imply that the others need not be covered in the maintenance instructions. Accordingly, the words "checks after an overweight landing" are deleted from Section XX.3(a)(5)(iv) (redesignated Section XX.3(b)(4)).

Section XX.3(b). A commenter recommends deletion of the requirement for an overhaul manual or section, contending that - (1) there are many products that, for safety reasons, should not be overhauled; and (2) the manufacturer must make the technical assessment as to whether a product can be safely overhauled. In the light of these comments, and after further consideration, the FAA finds that those portions of Section XX.3(b) that provide for overhaul information only (except for engines), should not be required in the Instructions for Continued Airworthiness. Accordingly, Sections XX.3(b)(1)(i), XX.3(b)(1)(ii), XX.3(b)(1)(iv), XX.3(b)(1)(viii), and XX.3(b)(3), are withdrawn. The other provisions of Section XX.3(b) specify information that is needed for purposes other than overhaul.

Section XX.3(b)(1)(iii). No adverse comment was received on this proposal to require structural access plate information. Accordingly, it is adopted as proposed, but redesignated Section XX.3(c).

Section XX.3(b)(1)(v). No adverse comment was received on this proposal to require instructions on special inspection techniques. Accordingly, it is adopted as proposed, but redesignated Section XX.3(d).

Section XX.3(b)(1)(vi). A commenter points out that no part can be restored to its original condition by protective coatings or treatments. The FAA agrees, and Section XX.3(b)(1)(vi) (redesignated Section XX.3(e)) is revised to make this clear and to require only the information necessary to apply protective treatments to the structure after inspection.

Section XX.3(b)(1)(vii). No adverse comment was received on this proposal to require data on structural fasteners. Accordingly, it is adopted as proposed, but redesignated Section XX.3(f).

Section XX.3(b)(1)(ix). No adverse comment was received on the proposal to require a list of special tools. Accordingly, it is adopted as proposed, but redesignated Section XX.3(g).

Section XX.3(c). Three commenters object to the concept of supplying generalized repair data. One contended that - (1) the nature of the damage may not be known in a particular case, though it may appear to fall under a general repair "fix"; (2) the safety of the product may be seriously impaired by repairs made in such instances; and (3) the manufacturer can provide alternate means for a mechanic to obtain repair data. In the light of these comments, the FAA agrees that it is not necessary to include the repair information in the Instructions for Continued Airworthiness as proposed. Accordingly, proposed Section XX.3(c) is withdrawn.

Section XX.4. A commenter suggests that the manufacturer should be allowed to list items in the Airworthiness Limitations section that it deems necessary to maintain structural integrity, where such items are not called out in the applicable airworthiness standards. Another commenter, representing the scheduled airlines, objects to the inclusion, in the Airworthiness Limitations section, of mandatory replacement times for parts other than life-limited parts and of mandatory inspection intervals. The resolution of these comments is discussed under Proposal 8-3. The language proposed for the Airworthiness Limitations sections of the appendices to Parts 23, 25, 27, and 29 is being retained, except that the mandatory replacement times, mandatory inspection intervals, and related procedures are specified as those associated with structural integrity - including those approved under current Section XX.571. It also is made clear that FAA approved alternative programs may be used. To avoid unnecessary restriction being placed on operation, only these items are listed in the pertinent Airworthiness Limitations section. Other items can of course be listed in other sections of the Instructions for Continued Airworthiness.

Proposal 8-26. The addition of new Section 25.101(i) and (j) would set forth requirements for automatic systems that affect performance, including automatic takeoff thrust control systems (ATTCS). In view of the evolving technology of automatic

systems, the special features and functions of each design, and the complex interrelationships with other systems, the FAA has concluded that specific regulations are premature and that safety considerations can be more advantageously addressed in special conditions for specific systems. Accordingly, Proposal 8-26 and related Proposals 8-34, 8-48, and the Section 25.1305(c)(9) portion of 8-50 are withdrawn.

Proposal 8-27. The revision of Section 25.111(c)(4) will permit changes in power or thrust by an automatic takeoff thrust system but prohibit any change requiring action by the pilot when determining the takeoff path. Although specific proposals relating to criteria for automatic takeoff thrust systems have been withdrawn, the FAA believes that this proposal should be retained as it standardizes the procedure for determining the takeoff path, and is consistent with current practice.

One commenter implies that this rule change will add the task of monitoring conditions and instruments and thereby increase the pilot workload. Other commenters suggest that a limited provision for manual throttle setting be included, or are opposed to the proposal completely on the grounds that safety will be compromised in service. Since the rule will apply in the context of a determination of performance rather than an operating requirement, the proposal is adopted without change.

Proposal 8-28. A commenter suggests that the term "impair" in Section 25.253(a)(2)(iii) be changed to "significantly impair". The FAA does not agree. In present high altitude, high Mach number jet airplanes, any recovery from upset or speed anomaly must be done essentially by reference to flight instruments. Therefore, any buffet or vibration condition which would in any way impair the pilot's ability to accurately interpret instrument information cannot be tolerated. The same commenter stated that some interpretative material on vibrational frequencies and levels of acceleration would be useful. Use of interpretative material would divert attention from the primary consideration, impairment of pilot ability, which is qualitative. Proposed Section 25.253(a)(2)(iii) is adopted without substantive change.

Proposal 7-17. Although no unfavorable comment was received on the proposal to amend Section 25.305(d), two commenters state that their agreement was with the understanding that both the discrete gust and the continuous turbulence analyses are required. Present Section 25.341(a) requires that limit load factors be established by reference to a discrete gust encounter. Present Section 25.305(d) specifies that the dynamic response of the airplane to vertical and lateral continuous turbulence must be taken into account. Both analyses are required.

Two commenters recommend that present Section 25.341 be amended to require dynamic loads analysis by reference to discrete gusts having varying gust gradient distances. The FAA does not agree. The combination of discrete gust analysis under

Section 25.341 and continuous turbulence analysis under Section 25.305 is less complex than the method described by these commenters and provides sufficient substantiation of strength. The proposal is adopted without substantive changes.

Proposal 8-29. Many negative comments were received on the proposal to revise Section 25.307(a) require ultimate load tests for each normal and fail-safe critical load condition. Three commenters indicate that the proposed regulation would add to the cost and time required for certification although present airplane safety records do not support the need for a change. One commenter points out that the design philosophy used for commercial transports, due to the dominant influence of the economic requirement for long life without structural fatigue problems, often produces reserve margins of safety. Another commenter proposes that ultimate load tests be limited to structures such as composites, which substantially differ from conventional structure. The FAA agrees that to conduct ultimate load tests for all critical load conditions would greatly increase the amount of testing required, which is not warranted by the safety record since there have been no service features which indicate that present methods of substantiation are inadequate. In many cases failures in service result from conditions such as fatigue or corrosion which are not covered by ultimate load tests. The proposal to require ultimate testing of all structural components therefore is deleted. In some cases, however, analysis must be supplemented by limit and/or ultimate load tests. The amendment, as adopted, is revised accordingly.

Proposal 8-30. Several negative comments were received on Sections 25.365(e) and (f), requiring airplane designers to consider pressure vessel decompression resulting from the loss of any nonplug door, detonation of a bomb within the cabin at all probable locations, and engine disintegration. Several commenters oppose designing for the loss of a nonplug door, stating that there is no reason why nonplug doors cannot be designed to be as safe as plug doors. These commenters suggest that the door design criteria be upgraded to improve door integrity. The FAA agrees that door integrity should be improved to the extent that design for their loss is not justified. Therefore Section 25.783 is revised in response to Proposal 8-35 to require this improved level and Section 25.365(e)(1) is withdrawn.

Many commenters object to designing for all possible bomb detonations and probable bomb locations. A commenter points out that airworthiness requirements in the past have attempted to safeguard aircraft against structural and mechanical failure, human error, natural hazards, etc. They note that no one has attempted to incorporate into airworthiness requirements the consequences of homicidal or suicidal tendencies. Another commenter states that the aircraft industry has to accept responsibility for compensating the public for loss or injuries resulting from defects in its products, and the inclusion of a bomb damage requirement in Part 25 could significantly extend the

grounds of possible product liability actions, particularly with the imprecise requirements of Section 25.365(e). Many commenters state that the wording of Section 25.365(e)(3) is so vague as to make its implementation impossible. The FAA notes that, ultimately, minimizing the loss of airplanes as a result of bomb explosions is a ground security problem.

A commenter suggests an alternative to Section 25.365(e)(3) which would establish a relationship between the design maximum opening and the cross-sectional area of the pressurized shell. The FAA agrees that the proposed relationship provides an acceptable method for determining hole size. The FAA has determined that the maximum hole size required should be 20 square feet, a value contained in Airworthiness Directive 75-15-05 (August 11, 1975) pertaining to openings in wide-body transports. Section 25.365(e)(3) is revised to allow the maximum opening to vary as a function of the cross-sectional area of the pressurized shell to account for the differences in size between narrow and wide-body transports and is redesignated and adopted as Section 25.365(e)(2).

The FAA finds that the maximum opening specified in adopted Section 25.365(e)(2) will exceed the opening that would result from causes other than bomb explosions or engine disintegration, and that a probability safety analysis to determine hole size in passenger or cargo areas resulting from other causes is not needed. Thus, proposed Section 25.365(f) is withdrawn.

In light of the comments received on proposed Section 25.365(e)(4), and after further consideration, the FAA concludes that openings caused by airplane or equipment failure can occur in any compartment, and that partitions, bulkheads, and floors should be designed for openings from these causes. Thus, proposed Section 25.365(e)(4) is revised accordingly, redesignated, and adopted as Section 25.365(e)(3).

No adverse comments were received on proposed Section 25.365(e)(2) to require design to withstand penetration of the cabin by a portion of an engine following engine disintegration and the proposal is redesignated Section 25.365(e)(1) and adopted without substantive change.

Amendment to Section 25.571(a)(3). Because of the change to Section 25.1529 adopted in this amendment, the reference to the "maintenance manual" in Section 25.571(a)(3) is no longer appropriate. For consistency, Section 25.571(a)(3) references the Airworthiness Limitations section of the Instructions for Continued Airworthiness.

Proposal 8-31. Numerous unfavorable comments were received on the proposal to add a new Section 25.633 requiring that essential systems be designed to minimize damage caused by detonation of a bomb in the airplane. Most commenters contend that there is no means to protect essential systems from all possible bomb detonations and that bomb size and location cannot

be rationally defined. Several commenters indicate that the separation of essential systems on modern airplanes presently provides a measure of protection and that the proposed requirements of Section 25.633 are beyond the state of the art.

The FAA agrees that a rational means of determining and defining all possible bomb size/location combinations which would damage essential systems does not exist. Therefore, the proposal is withdrawn.

Proposal 8-32. Several commenters object to the proposed horizontal stabilizer "trim-in-motion" aural warning requirement of Section 25.677(e) on the grounds that the aural environment in today's cockpits is already cluttered and that finding new and distinctive aural warnings is becoming difficult. They further suggest that small increments of trim change should not cause aural warning, and that warnings should be given only when a safety-of-flight hazard exists. One commenter suggests that there is no need for separate aural warning on aircraft having direct trim control wheels in the cockpit.

The FAA agrees with the comments and upon further review concludes that the proposal is premature and unworkable. Accordingly, it is withdrawn for further study.

Proposal 8-33. Several adverse and supporting comments were received on the proposal to add a new Section 25.685(e) requiring arrangement of control systems to provide an airplane with the capability of continued safe flight and landing in the event of an inflight localized structural failure. Several commenters agree with the intent of the proposal and propose minor changes. One commenter agrees with the intent of the proposal, but believes that only failures which have not been shown to be extremely improbable need be considered. Commenters state that the intent of the proposed rule change is already encompassed by Section 25.365(e) which would require that floor failure resulting from rapid decompression be shown to be extremely improbable.

A commenter further states that present Section 25.671(c) requires control systems to be designed to be tolerant of failures, and that control system damage is more likely from other sources. The commenter claims that service experience and rational analysis show that the floor structure provides the best available protection for the control system from damage from these other sources.

After further study the FAA agrees with the commenters that the primary objectives of this proposal are adequately covered by several existing sections of FAR 25. For example: Section 25.365(e) requires that the floor be designed for pressure vessel opening which is a function of the cross-sectional area of the fuselage; Section 25.571 requires all structure to be damage tolerant where practical; Section 25.671 requires that control systems be tolerant of failures, including exterior damage;

Section 25.629 requires freedom from flutter under failure conditions; Section 25.631 requires protection of controls in the empennage structure from bird strikes; and Section 25.901(d) requires design precautions be taken to minimize the hazards to the airplane, including control systems, in the event of an engine rotor failure. The proposal therefore is withdrawn.

Proposal 8-34. For an explanation of the withdrawal of the proposals concerning automatic systems that affect airplane performance, one of which is the proposal to add a new Section 25.705, see Proposal 8-26.

Proposal 8-35 and 2-59. Several commenters object to the requirement in Section 25.783(e) that provisions for the inspection of door locking mechanisms must be discernable under all possible lighting conditions. The commenters state that allowance should be made for use of supplemental lighting such as a flashlight to aid in the inspection. The FAA agrees and the section is revised accordingly.

A commenter states that direct visual inspection is only needed for external doors for which the initial opening movement is not inward and which are pressurized or for which an inadvertent opening could prevent continued safe flight and landing. Although these comments have merit, they go beyond the scope of Proposal 8-35 and interested parties have not had an opportunity to comment on these changes. No change to the section is being made based on these comments. Several commenters object to the redundancy of a dual warning system requirement and state that in lieu of redundancy, a reliability level should be specified. Further comments state that all external doors do not require this level of reliability. The FAA agrees that this reliability level could be specified and should apply only to external doors for which initial movement is not inward, and the section is changed accordingly. The present language defining where door warning systems are required is retained, as no change in present practice is intended.

A commenter suggests that Section 25.783(e) should specify several good design practices. These design practices are desirable but are not essential, since the necessary level of safety can be obtained by alternate means under Section 25.783.

Several commenters object to new Section 25.783(f), suggesting that it apply only to nonplug type doors and doors whose loss would present a probable hazard. The FAA agrees that provisions to prevent unsafe pressurization can be limited to doors whose loss would present a probable hazard. However, the FAA does not agree that it should be limited to nonplug type doors because a plug door is defined as one whose initial opening is inward and this feature does not necessarily provide complete assurance that an unsafe pressurization will not occur with subsequent opening of the door in flight. The clarifying phrase "to an unsafe level" has been added to Section 25.783(f). The intent is to prevent pressurization to a level which would be

hazardous if an unlocked external door inadvertently opened.

Several commenters object to proposed new Section 25.783(g) (Proposal 8-35), stating that it would unnecessarily preclude the use of nonplug type doors above 45,000 ft. The FAA agrees that nonplug type doors can safely be used at altitudes above 45,000 ft., since adequate warning systems and door integrity are provided by Section 25.783(e). Proposed new Section 25.783(g) is withdrawn.

A commenter proposes that for the door whose opening would be a hazard, the door and immediate surrounding fuselage, door mechanisms, and warning system be designed for any combination of failures (including improper operation) not shown to be extremely improbable. The FAA agrees. In place of the proposals in 8-30, with regard to Sections 25.365(e)(1), (3), and (4), a rule is included to require determination by safety analysis that inadvertent opening of doors which could prevent continued safe flight and landing is extremely improbable.

Two commenters state that the criteria for passenger egress in the revision to the second sentence of Section 25.783(g) (Proposed 2-59 of Notice 75-10) should be evacuation time, and not the rate of passenger egress through a given exit. The FAA agrees. Revision of the second sentence of Section 25.783(g) is redesignated as Section 25.783(i) and the reference to Section 25.561(a)(3) in the proposal is corrected to reference Section 25.561(b)(3).

Numerous negative comments concern proposed new Section 25.783(j), which requires that lavatory doors open into the cabin to preclude anyone from being trapped in the lavatory. The commenters state that this requirement is overly restrictive on design and that an outward opening door could have an adverse effect on aisle width and emergency evacuation capabilities if such a door jammed open. The FAA agrees that inward opening doors can be designed to prevent anyone being trapped in a lavatory in cases of incapacitation or for other reasons. Thus, new Section 25.783(j) is revised to delete the requirement that lavatory doors open into the cabin.

Proposals 8-36, 2-60, and 8-37. Final action on Proposals 8-36, 2-60, and 8-37 was taken in Airworthiness Review Program, Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8-38. One commenter objects to adding a new Section 25.792 to require a sign indicating whether lavatories are occupied, asserting that it would be inappropriate for general aircraft certificated under Part 25. Two commenters doubt that the proposed rule would achieve the objective of preventing aisle congestion near lavatories. They point out that many existing aircraft have similar signs which have not prevented people from "standing in line" for lavatories. Also, passengers can cause congestion in aisles for other reasons. One

of the commenters states that lighted signs in a darkened cabin; i.e., during movies or rest periods, would annoy passengers, and that the rule might foster a proliferation of signs throughout the cabin. Finally, one commenter is concerned that any increase in the number of lighted signs might distract the passengers' attention from more essential notices.

Based on the comments and upon further review, the FAA finds that the proposed requirement would not achieve the objective sought. Accordingly, the proposal is withdrawn.

Proposal 8-39. Final action on Proposal 8-39 was taken in Airworthiness Review Program Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8-40. Final action on Proposal 8-40 was taken in Operations Review Program Amendment No. 8 (45 FR 41586, June 19, 1980).

Proposal 8-41. A commenter suggests that new Section 25.851(a)(5), which replaces current Section 25.853(f), be expanded to prescribe four fire extinguishers for a passenger capacity of 100 or more, and to require at least one CO2, dry chemical, or all purpose fire extinguisher near lavatory and galley areas. These suggested changes are beyond the scope of the notice. However, changes in these requirements are appropriate and the FAA is conducting a research program to establish comprehensive standards and guidance information pertaining to the selection of portable fire extinguishers, taking into consideration types and quantities of extinguisher agents, extinguisher performance, and other factors. Regulatory changes based on the findings of this research program will be proposed in the next airworthiness standards review.

Sections 25.851(a)(5) and (a)(6), which consolidate hand fire extinguisher requirements, are adopted without substantive change.

Proposals 8-42, 2-18, 2-65, 2-114, and 2-160. Final action on Proposals 8-42, 2-18, 2-65, 2-114, and 2-160 was taken in Airworthiness Review Program, Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8-43. Final action on Proposal 8-43 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 8-44. For a discussion of proposed Section 25.905(c), see the discussion under Proposal 8-103. The proposal to add a new Section 25.905(c) is adopted without substantive change.

Proposals 8-45 and 8-96. The proposed amendments to Sections 25.939 and 33.65 are being deferred for consideration in a forthcoming notice of proposed rule making of the Aircraft

Engine Regulatory Review Program.

Proposals 8-46, 3-35, and 8-47. Final action on Proposals 8-46, 3-35, and 8-47 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; Oct. 30, 1978).

Proposal 8-48. For an explanation of the withdrawal of the proposals concerning automatic takeoff thrust control systems, one of which is the proposal to add a new Section 25.1143(f), see Proposal 8-26.

Proposals 8-49 and 3-41. Final action on Proposals 8-49 and 3-41 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; Oct. 30, 1978).

Proposal 8-50. For an explanation of withdrawal of the proposals concerning automatic takeoff thrust control systems, one of which is the addition of a new Section 25.1305(c)(9), see Proposal 8-26.

One commenter objects to revising Section 25.1305(d)(1), stating that significant aerodynamic forces acting on the powerplant nacelle make the direct measurement of thrust impractical. The FAA agrees that such forces may be significant. This commenter further objects to the revision, stating that it is beyond the state of the art to prohibit a parameter from being used if the accuracy of the indication will be adversely affected by any engine malfunction or damage. The FAA agrees that precise values of thrust provided by a malfunctioning, damaged, or deteriorated engine are unnecessary, provided that any changes in thrust due to engine malfunction, damage, or deterioration are indicated to the pilot. The paragraph is revised to require that the indication must be based on the direct measurement of thrust or of parameters that are directly related to thrust.

Although concurring with Section 25.1305(d)(1), one commenter states that he would prefer to retain the existing requirements and delete the words ", or to indicate a gas stream pressure that can be related to thrust,". The FAA does not agree. The change suggested by this commenter would eliminate the requirement for thrust information and would retain the requirement for change-of-thrust information only. It also would provide a lower level of safety than the adopted paragraph.

This commenter also states that Section 25.1305(d)(1) should be complementary to a similar requirement in Part 33 of this chapter. The FAA does not agree. In current practice, the airframe manufacturer determines how performance should be met. The choice of a means to indicate thrust is negotiated between the airplane manufacturer and the engine manufacturer. The factors which influence the final choice are substantial and may vary among airplane designs. These factors may not be known to the engine manufacturer at the time of engine type certification. Another commenter states that the need for an actual value of

thrust is not obvious, whereas indication of a loss of thrust would satisfy the original proposal. The FAA agrees that the actual value of thrust is of little value to the pilot. Section 25.1305(d)(1) is revised to specify that the indicator indicate thrust, or a parameter related to thrust, to the pilot.

Proposal 8-51. No unfavorable comments were received on the proposal to change the reference in Section 25.1307(h) for fire extinguishers in connection with Proposal 8-41. Accordingly, the proposal is adopted without substantive change.

Proposal 8-52. Final action on Proposal 8-52 was taken in Airworthiness Review Program, Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8-53. Several commenters point out a number of service deficiencies with proposed Section 25.1421 which defines the requirements for cargo compartment fire detection systems. They contend that the requirement for the detection system to actuate a warning within one minute of the start of a fire is too restrictive. One commenter cites the results of FAA tests which show average fire detection times to be from 1.75 to 5 minutes. The commenters also suggest that the tests necessary to show compliance with the warning requirements are not clearly defined. Finally, one commenter points out that fires in baggage containers and other enclosed containers can burn for a considerable time before detection is likely by fire detectors in the cargo compartment.

The FAA does not concur that the one-minute requirement is too restrictive. A survey of fire detection technology has indicated that the state of the art permits detection of a fire in less than one minute after inception. In addition, current standards do not define the test procedures necessary to show compliance with warning requirements. The new one-minute requirement is intended to improve the standards in this regard.

The proposal is adopted without substantive change.

NOTE: This proposal has been carried erroneously under Section 25.1421 which pertains to megaphones. It will be included in the amendment as a new Section 25.858.

Proposal 8-54. Comments received from several commenters reflected confusion over the intent of proposed Section 25.1439(c). It was noted that much of what was intended by proposed Section 25.1439(c) is included in existing Section 25.1439(a) as amended by Amendment 25-38 (41 FR 55454; 12/20/76), provided that the portable oxygen requirements of Section 25.1447(c)(4) are retained. Amendment 25-38 emanated from Airworthiness Review Program Notice No. 2 (40 FR 10813; 3/7/75), and was adopted (41 FR 55468; 12/20/76) after publication of Airworthiness Review Program Notice No. 8 (40 FR 29420; 7/11/75) which contained proposals 8-54 and 8-55. The FAA agrees that the existing regulations require much of what was intended by

proposal 8-54, provided that proposal 8-55 is withdrawn. The FAA further agrees that additional clarifications are needed before further amendments are made to Section 25.1439. Therefore the FAA withdraws both proposals 8-54 and 8-55. The subject of protective breathing equipment will be addressed in a forthcoming notice of proposed rule making.

Proposal 8-55. The proposal to delete Section 25.1447(c)(4) is withdrawn for the reasons stated for withdrawal of proposal 8-54.

Proposal 8-56. For comments related to the proposal to revise Section 25.1521(a), and for the withdrawal of that proposal, see Proposal 8-94.

Proposal 8-57. Final action on Proposal 8-57 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 8-58. For comments related to the proposal to amend Section 25.1529, see Proposal 8-21.

Proposal 8-59. A commenter objects to the proposed new Section 25.1557(e), calling for a placard on each flight attendant seat to indicate that it may be occupied by a flight attendant, asserting that such placarding is redundant and that a proliferation of placards in the aircraft will only serve to confuse the passengers and make all placards less effective. The commenter also states that the proposal would prohibit non-flight attendant airline personnel who are cognizant of emergency procedures from occupying flight attendant seats when the aircraft is full. The FAA concludes that a new aircraft certification rule is unnecessary to achieve this result and the proposal is withdrawn.

Proposals 8-60 and 8-61. Final action on Proposals 8-60 and 8-61 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 7-55. A commenter recommends that discrete gusts with varying gradient distances be added as a supplement to Appendix G to Part 25. The FAA disagrees because past experience with the use of discrete gusts with varying gust gradient distances has indicated that knowledge with regard to how gust intensity varies with gust gradient distance is not currently available to the designer. The research and development accomplished in the area of dynamic response to continuous turbulence has indicated that the continuous turbulence criteria of Appendix G to Part 25 is the most rational approach currently available which give consistent strength levels for airplanes of different characteristics and missions.

A commenter recommends that paragraph (a) of Appendix G be revised to delete the requirement for considering combined stresses based on both vertical and lateral components of

turbulence. The commenter states that the current practice of combining root-mean-square stresses (shear, moment, and torsion) resulting from gust calculations involving only purely vertical or lateral components of turbulence is a realistic, practical method for combining stress. The commenter contends that the methods for realistically combining statistical load quantities involving both vertical and lateral components of turbulence have not been satisfactorily developed in the current state of the art. After further review the FAA agrees. Paragraph (a) of Appendix G is revised to delete the requirement for considering the combined stresses resulting from the vertical and lateral components of turbulence.

A commenter recommends that paragraph (b)(3)(i) of Appendix G be revised to require a gust intensity of V sub sigma = 75 fps gust velocity in the interval 0 to 20,000 ft. altitude with a linear decrease to 30 fps at 80,000 ft. altitude. This recommendation would obviate the need to do mission analysis to justify lower levels of loads than those required to meet the design envelope gust intensity factor of 85 fps for new airplanes whose characteristics are similar to previous designs which have been shown to be adequate for the lower level of gust intensity being proposed. There is no technical need for new aircraft which are similar to existing aircraft with regard to response characteristics and basic mission profiles to make extensive mission analysis computations in order to establish their adequacy with regard to loads resulting from encounters with continuous turbulence if they are designed for the gust intensity shown to be adequate for the existing design. Therefore, it is acceptable to use a gust intensity value of 75 fps from 0 to 20,000 ft. altitude, and a linear reduction from 75 fps at 20,000 ft. to 30 fps at 80,000 ft., provided the new design is comparable to a similar design with extensive satisfactory service experience. These criteria, which have been under discussion between FAA and industry for over 10 years, are proposed as new rules rather than acceptable means of complying with existing rules. Paragraph (b)(3)(i) is revised accordingly. The commenter also recommends that paragraph (d)(1) be revised to require a gust intensity of V sub sigma = 60 fps on the internal 0 to 20,000 ft. altitude and be linearly decreased to 23 fps at 80,000 ft. altitude. The FAA disagrees. The gust intensities in paragraph (d)(1) are based on the distribution of gust intensity with altitude which were developed in the basic research for the development of continuous turbulence criteria and are, therefore, considered reasonable as a lower design envelope limit for mission analysis. A cost analysis was provided by the commenter to justify the lower gust intensities, but the FAA finds that this cost analysis was based on "design envelope analysis" alone. Paragraph (c), which is an alternative to paragraph (b), provides for a "mission analysis". Actual experience has shown that "mission analysis," which considers airplane operational characteristics, has been used in the past in lieu of the 85 fps intensities to prevent weight and cost penalties. Paragraphs (c) and (d) of Appendix G are adopted without substantive change.

A commenter recommends that paragraph (d) of Appendix G be revised to delete the reference to "fail-safe loads" since such loads are not provided in Appendix G. The FAA agrees. Paragraph (d) of Appendix G is revised accordingly.

A commenter recommends that proposed paragraph (e) of Appendix G be deleted since acceleration levels measured at the pilot station on current conventional aircraft can be established by flight demonstration much more easily and with less cost than by use of an expensive analysis considering response to continuous turbulence. Upon further review, the FAA has determined that it lacks sufficient information to specify the right combination of analysis and flight test to determine the acceleration levels at the pilot's station during continuous turbulence. Accordingly, proposed paragraph (e) of Appendix G is withdrawn. The current requirements related to operation in turbulence are adequate to determine the response at the pilot's station during continuous turbulence.

Proposal 8-62. For comments related to the proposal to add a new Appendix G to Part 25, see Proposal 8-25. Appendix G (redesignated Appendix H) to Part 25 is adopted with the changes discussed in Proposal 8-25.

Proposal 8-63. Final action on Proposal 8-63 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Amendment to Section 27.571. Because of the change to Section 25.1529 adopted in this amendment, the reference to Section 27.1529(a)(2) in Sections 27.571(b), (c), (d)(1), (d)(3), and (e) is no longer appropriate. The reference is changed to "Section A27.4 of Appendix A". This discrepancy was overlooked in Notice 75-31 (40 FR 29410; July 11, 1975). Since this amendment is clarifying in nature and does not impose a burden on the public, notice and public procedure are unnecessary and good cause exists for adopting this amendment.

Proposal 8-64. For comments related to the proposal to amend Section 27.1529, see Proposal 8-21.

Proposals 8-65 and 8-66. Final action on Proposals 8-65 and 8-66 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 8-67. For comments related to the proposal to add a new Appendix A to Part 27, see Proposal 8-25. Additional comments on this proposal, and on the proposal to add a new Appendix A to Part 29, are discussed here.

A commenter suggests that the wording of Appendix A be adjusted to take into account the differences between airplanes and rotorcraft. The FAA agrees. The Appendix, as proposed, is generally equally applicable to airplanes and rotorcraft. However, several minor changes have been made to the appendix to

provide for rotorcraft differences, primarily to cover rotors and differing fatigue standards.

A commenter objects to Appendix A, contending that: (1) The standards in current Sections 27.1529 and 29.1529 have been adequate in service, and (2) the proposal is excessive in scope and would create an undue burden. The FAA does not agree, having found that recommended maintenance procedures made available to operators/owners in the past were frequently inadequate in scope and content, providing no sound basis for maintaining the airworthiness of the rotorcraft. Appendix A, with the revisions and deletions discussed above and under Proposal 8-25, would not create an undue burden on the type certificate applicant.

One commenter expresses concern that certain inspection provisions in current Section 91.217 might be applied to rotorcraft. The appendix contains no such requirement. Current Section 91.217 applies only to certain airplanes.

Amendment to Section 29.571. Because of the change to Section 29.1529 adopted in this amendment, the reference to "Section 29.1529(a)(2)" in Sections 29.571(b), (c), (d)(1), (d)(3), and (e) is no longer appropriate. For consistency, the reference is changed to "Section A29.4 of Appendix A required by Section 29.1529". This change was overlooked in Notice 75-31 (40 FR 29410; July 11, 1975). Since this amendment is clarifying in nature and does not impose a burden on the public, notice and public procedure are unnecessary and good cause exists for adopting this amendment.

Proposal 2-154. For a discussion directly related to proposed new Section 29.783(g), see the discussion under Proposal 8-35 for Section 25.783(g) (Proposal 2-59 of Notice 75-10). Section 29.783(g) is adopted without substantive change.

Proposals 8-68 through 8-76 and 2-164. Final action on Proposals 8-68, 8-69, 8-70, 8-71, 8-72, 8-73, 8-74, 8-75, 8-76, and 2-164 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 8-77. For comments related to the proposal to amend Section 29.1529, see Proposal 8-21.

Proposals 8-78 and 8-79. Final action on proposals 8-78 and 8-79 was taken in Airworthiness Review Program, Amendment No. 7: Airframe Amendments (43 FR 50578; October 30, 1978).

Proposal 8-80. For comments related to the proposal to add a new Appendix A to Part 29, see Proposals 8-25 and 8-67.

Proposal 8-81. No unfavorable comments were received on adding a new Section 31.12 providing for standardized application of the airworthiness requirements for balloons. Accordingly Section 31.12 is adopted without substantive change.

Proposal 8-82. No unfavorable comments were received on adding a new Section 31.16 requiring that balloon empty weight be determined. Accordingly, Section 31.16 is adopted without substantive change.

Proposal 8-83. No unfavorable comments were received on the intent of new Section 31.17 which specified performance in terms of an initial minimum rate of climb. However, a commenter raises the question whether compliance with proposed Section 31.17(a) could be shown by testing at several altitudes and ambient temperatures and then extrapolating, by appropriate analysis, to the other values in the range for which approval is sought. The FAA considers that such extrapolation by analysis is an acceptable means of complying with proposed Section 31.17(a), because the climb performance of balloons is based on fundamental principles and, therefore, can be predicted with sufficient accuracy from established test points.

The FAA notes that the 300 fpm climb rate rquirement in Section 31.17(a) was intended as a minimum standard. To make this clear, Section 31.17 as adopted is revised by inserting the words "at least" before the number "300" in the first sentence of Section 31.17(a).

Proposal 8-84. A commenter, referring to new Section 31.19(a) governing critical uncontrolled descent, suggests that it would be difficult and time-consuming to determine which tear is the most critical single tear in the balloon envelope between tear stoppers. The FAA does not agree. An analysis, or a combination of test and analysis, would be an acceptable means of determining the most critical single tear. It would not be necessary to test each kind of tear. No other unfavorable comments were received on the proposal to add a new Section 31.19. Accordingly, Section 31.19 is adopted without substantive change.

Proposal 8-85. No unfavorable comments were received on the proposal to amend Section 31.27(c) to be consistent with new Section 31.19, Performance: Uncontrolled descent. Accordingly, the proposal is adopted without substantive change.

Proposal 8-86. No unfavorable comments were received on the proposal to amend Section 31.65 updating the position light standards and expressing them in language consistent with related standards in other airworthiness parts. However, the FAA finds that the use of a cross reference to Section 23.1397 as proposed in Section 31.65(e) may be inconvenient for those governed by Part 31. Accordingly, Section 31.65, as adopted, sets forth the chromaticity coordinates for aviation red and aviation white as currently prescribed in Section 23.1397.

Proposal 8-87. No unfavorable comments were received on the proposal to amend Section 31.71. However, after further consideration, the FAA concludes that proposed Section 31.71(a)(2) is unnecessarily restrictive in that it would, in all

cases, require marking the equipment as to its identification, function, and operating limitations. Marking of the equipment as to its identification, function, or operating limitations, or any applicable combination of those factors is sufficient. This is also the language used in corresponding sections of other aircraft airworthiness regulations. Section 31.71, as adopted, is revised accordingly.

Proposal 8-88. No unfavorable comments were received on the proposal to amend Section 31.81 to detail operating limitations and information. The FAA notes, however, that proposed Section 31.81(b) is not clear as to which "operating limitations and other information necessary for safe operation" must be furnished. The FAA's intent, as stated in the explanation, is to require that the information established under Section 31.81(a) be furnished. Section 31.81(b) is revised accordingly. Section 31.81(a) is adopted without substantive change.

Proposal 8-89. A commenter is concerned that proposed Section 31.82 might require balloon manufacturers to prepare two overlapping maintenance documents - the maintenance manual currently supplied to operators/owners, and the proposed Instructions for Continued Airworthiness. The FAA notes that under Sections 31.82 and 21.50(b), balloon manufacturers would be required to prepare and furnish only the Instructions for Continued Airworthiness.

The FAA notes further (as discussed under Proposal 8-21) that the Instructions for Continued Airworthiness need not be finalized until delivery of the first balloon, while Section 31.82, as proposed, could be interpreted to require that they be finalized before type certification. This point is clarified in Section 31.82, as adopted, consistent with the corresponding requirement in Parts 23, 25, 27, and 29.

Proposal 8-90. No unfavorable comments were received on the proposal to amend Section 31.85(b)(1). However, a commenter questions whether percentage figures on the required fuel quantity gauge would be acceptable. The FAA has determined that, in the particular case of balloons (for which the fuel quantity information is to an extent less important to safety than for other classes of aircraft), calibration of the fuel quantity gauge in percent of fuel cell capacity is an acceptable means of complying with the last sentence of Section 31.85(b)(1). Section 31.85(b)(1), as adopted, is revised to make this clear.

Proposal 8-91. No adverse comments were received on the proposal to add a new Appendix A to Part 31. However, comments received on the proposals to add a similar appendix to Parts 23, 25, 27, and 29 (Proposal 8-25), were equally valid with respect to this proposal. Accordingly, Appendix A to Part 31, as adopted, is revised in substance as applicable.

Regarding the proposals to require generalized repair data in the Instructions for Continued Airworthiness, it is more

appropriate, as well as necessary and practicable, to include specific instructions for repair of the key elements of a balloon - the balloon envelope and its basket or trapeze. This information is incorporated in paragraph A31.3(i) as revised.

Proposal 8-92. A commenter objects to Section 33.4 insofar as it would require completion of the Instructions for Continued Airworthiness before the type certificate is issued, contending that a significant portion of the data and other material called for is typically not compiled until 6 months or longer after type certification. The commenter suggests that manufacturers be allowed to prepare and make available the Instructions for Continued Airworthiness before the first aircraft equipped with the subject engine is put into service, which, it claims, is the earliest such instructions would be needed. Requiring the engine manufacturer to complete the Instructions for Continued Airworthiness before the type certificate is issued would constitute an unnecessary burden. However, the FAA considers that they must be made available, and furnished, upon delivery of the first engine on an aircraft or issuance of a standard certificate of airworthiness for the aircraft, whichever occurs later. This would be consistent with corresponding requirements proposed for other products. See Proposals 8-5 and 8-21. Section 33.4 is revised and adopted accordingly.

Proposal 8-93. A commenter observes that Section 33.5 requires that the instruction manual for installing and operating the engine be "approved," whereas proposed Section 33.4 requires that the Instructions for Continued Airworthiness be "acceptable to the Administrator," and recommends that the latter term be used for consistency. The FAA notes that the term "acceptable to the Administrator" is widely used in Part 43 in connection with maintenance requirements, whereas the term "approved" is more frequently used in FAR Parts containing installation and operating requirements. Considering the FAR as a whole, the FAA does not agree that such consistency is essential. Accordingly, Section 33.5 is adopted as proposed.

Proposal 8-94. Several commenters object to proposed Sections 33.6(e) and (f), and to proposed Sections 23.1521(a) and 25.1521(a) (Proposals 8-20 and 8-56, respectively) on the grounds that the use of rated takeoff power or thrust for 10 minutes with one engine inoperative should not be limited to "the extent that the utilization is necessary for the airplane to avoid, without necessitating turning maneuvers, obstacles beneath the flight path intended for the airplane prior to the loss of the engine." In light of these comments and after further review, the FAA concludes that these proposals are premature and they are withdrawn.

In addition, the proposed transfer of the definitions for rated power and thrust from Section 1.1 to proposed new Section 33.6, Proposal 8-1, is withdrawn since the transfer may cause confusion in the administration of the aircraft certification requirements. Accordingly, Proposals 8-1, 8-20, 8-56, and 8-94

are withdrawn.

Proposal 8-95. For discussion of proposed Section 33.19(b) see the discussion under Proposal 8-103. Revised Section 33.19 is adopted without substantive change.

Amendment to Sections 33.55(c), 33.57(b), 33.93(b), and 33.99(b). Because of the deletion of Sections 33.5(c), (d), and (e), and the addition of a new Section 33.4, the reference to "Section 33.5" in Sections 33.55(c), 33.57(b), 33.93(b), and 33.99(b) is no longer appropriate. For consistency, the reference is "Section 33.4." This change was inadvertently overlooked and was not proposed in Notice 75-31 (40 FR 29410; July 11, 1975). This editorial change corrects that discrepancy. Since this amendment is clarifying in nature and does not impose a burden on the public, notice and public procedure are unnecessary and good cause exists for adopting this amendment.

Proposal 8-97. A commenter recommends that Section A33.3(a)(6) of Appendix A to Part 33 be revised by adding the words "requiring periodic attention" so as to make it clear that scheduling information is required solely for parts that require such attention. The language in this section is adequate. For parts not needing periodic attention, the applicant has only to state that parts not scheduled need not be serviced.

A commenter infers incorrectly that proposed Sections 43.16 and 91.163(c) apply only to rotorcraft. These regulations with the revision proposed also affect other classes of aircraft, as well as engines and propellers.

Some comments received on the proposed appendices for Parts 23, 25, 27, and 29 (Proposal 8-25) were equally valid with respect to proposed Appendix A to both Parts 33 and 35. Accordingly, the appendices to Parts 33 and 35 are revised in substance as applicable.

Proposal 8-98. For a discussion related to proposed Section 35.3 see Proposal 8-93. A commenter observes that Section 35.3 requires that the instruction manual for installing and operating the propeller be "approved," whereas Section 35.4 requires that the Instructions for Continued Airworthiness be "acceptable to the Administrator," and recommends that the latter term be used for consistency. The FAA notes that the term "acceptable to the Administrator" is widely used in Part 43 in connection with maintenance requirements, while the term "approved" is more frequently used in FAR parts containing installation and operating requirements. Considering the FAR as a whole, the FAA does not agree that consistency is required in this instance. Accordingly, Section 35.3 is adopted as proposed.

Proposal 8-99. In response to the concern of a commenter representing a number of Part 121 operators, the FAA notes that there is no requirement that any operator/owner use the Instructions for Continued Airworthiness referred to in proposed

Section 35.4. The new Sections 43.13(a), 43.16, and 91.163(c) allow the use of other methods. In particular, the use of maintenance manuals and continuous airworthiness maintenance programs developed under Parts 121, 123, 127, and 135, or an inspection program approved under Section 91.217(e) would be acceptable alternatives to the Airworthiness Limitations section. This commenter suggests that language be added to proposed Section 35.4 to make it clear that such alternatives may be used. The FAA agrees. The language in Section 43.16 and 91.163(c) is revised accordingly.

Consistent with the discussion on proposed Section 33.4 dealing with engines (Proposal 8-92), the FAA finds that requiring the propeller manufacturer to complete the Instructions for Continued Airworthiness before the type certificate is issued would constitute an unnecessary burden. Accordingly, Section 35.4 as adopted, requires that those instructions be made available and furnished upon delivery of the first aircraft with the propeller installed, or upon issuance of a standard certificate of airworthiness for an aircraft with the propeller installed, whichever occurs later.

Proposal 8-100. No unfavorable comments were received on the proposal to amend Section 35.5 to more clearly indicate the basis for operating limitations and where they are listed. Accordingly, Section 35.5 is adopted without substantive change.

Proposal 8-101. No unfavorable comments were received on the proposal to amend Section 35.23 to provide an extreme low pitch indication. Accordingly, Section 35.23 is adopted without substantive change.

Proposal 8-102. A commenter does not concur with the proposal to revise Section 35.37 to require evaluation of metallic hubs and blades, stating that the words "must", "all", and "reasonably foreseeable" in the second sentence imply responsibility beyond current knowledge and the state of the art. The FAA does not agree. These terms are used in the current rule and the current state of the art defines the limits of the provision.

The same commenter recommends that Section 35.37 be revised to apply to consideration of "normal and reasonably foreseeable load patterns," to account for the fact that only normal operations will or should be considered. The FAA does not agree. Load patterns which are reasonably foreseeable are critical and should be investigated even if they are not normal.

The same commenter also indicates that the third sentence should be revised to eliminate the term "reduction factors," since reduction factors are identified with only one particular method of presentation. The FAA agrees and the section is revised accordingly. This commenter finally states that the explanation implies that manufacturers have not taken permissible damage and material variation into account. This implication is

not intended. It is the FAA's view that the fatigue evaluation should consider the occurrence of typical service damage and variation in material properties and the rule would provide for such an evaluation.

Another commenter suggests that the section be revised by adding certain technical requirements that are related to infinite component life. It is not necessary to specify requirements concerning infinite component life, since they are considered a normal part of propeller fatigue testing.

Section 35.37 is adopted as revised.

Proposal 8-103. A commenter objects to the proposal to add a new Section 35.42 to define durability requirements for propeller blade pitch control system components, stating that the term "bench tests" in Sections 35.42(a) and (b) is too descriptive and restrictive. The FAA agrees that a reference to "bench tests" may be too restrictive. Other test methods may be equally acceptable in providing the necessary data. Accordingly, Sections 35.42(a) and (b) are revised to eliminate the specific reference to "bench".

The commenter also suggests that the words "in frequency and amplitude" be eliminated from Section 35.42(a) since the words "cyclic testing" are fully descriptive. The FAA believes that these words are needed to prescribe key elements in the required test.

The commenter further suggests that the proposed testing to the equivalent of 1,000 hours of propeller operation is too restrictive in the case of a propeller with an overhaul period of less than 1,000 hours. The FAA considers the specific testing to be the minimum necessary to provide an acceptable safety level in service. The rule does not, however, prevent the selection of overhaul intervals of less than 1,000 hours.

Finally, the commenter suggests that the rule should permit an alternate of acceptance based upon service experience. The FAA recognizes that service experience can provide a statistical basis for determining component reliability. Its applicability, however, may vary according to such considerations as type of operation, the nature of the article under consideration, the degree of similarity between the reference article and the certification article, and the completeness of service records. Since it is dependent on such a variety of factors, the FAA does not agree that a specific alternative based on service experience should be included.

The proposal to add a new Section 35.42, therefore, is adopted with the change discussed below. No adverse comments were received on the related proposed revisions to Sections 23.905, 25.905, and 33.19 to add the reference to new Section 35.42, and the revisions are adopted.

Proposal 8-104. For comments related to the proposal to add a new Appendix A to Part 35, see Proposals 8-25 and 8-97.

A commenter objects to proposed Section A35.1(c) of the appendix because the propeller owner (aircraft operator) would be wastefully provided with instructions and data that the propeller owner has no authority to use. The FAA does not agree. The Instructions for Continued Airworthiness must be furnished to the aircraft owner/operator who is the person responsible for maintaining the aircraft (including the propeller). The owner/operator may not be authorized to maintain the propeller, but the owner/operator can place the instructions in the hands of persons who are authorized.

The new Appendix A to Part 35, as adopted, is revised in accordance with comments discussed in Proposal 8-97.

Proposal 8-105. The proposed revision of Section 43.9(a)(4) is being deferred for consideration in a forthcoming notice of proposed rule making of the Operations Review Program.

Proposal 8-106. A commenter representing a number of scheduled air carriers is concerned that the use of maintenance manuals and continued airworthiness programs developed under current Section 121.133 and Subpart L of Part 121 (generally via Maintenance Review Board procedures), or under similar provisions of Parts 127 and 135, might not be acceptable as "other methods, techniques, and practices" under the terms of proposed Section 43.13(a). This commenter suggests that language be added to proposed Section 43.13(a) to make this clear. The FAA does not agree. The proposed language states that the use of such manuals and continued airworthiness programs is acceptable.

Proposal 8-107. A commenter representing a number of scheduled air carriers recommends that the Airworthiness Limitations section referred to in proposed Section 43.16 include life limitations only and not inspections or other maintenance items. As discussed under Proposal 8-3, the FAA does not agree.

A commenter suggests that the words "or other methods, techniques; and practices acceptable to the Administrator" be added at the end of proposed Section 43.16 to make it consistent with proposed Section 43.13(a). The Airworthiness Limitations section contains specific mandatory replacement times and inspection intervals (with related procedures) that must be complied with, unless it can be shown by an operator with an approved maintenance program that these times are inappropriate for this operation. The use of alternatives not covered in the Airworthiness Limitations section would be allowed if approved by the Administrator. Section 43.16 is revised to specifically state the alternatives to compliance with the Airworthiness Limitations section.

Proposal 8-108. No unfavorable comments were received on the proposal to amend Section 45.11 to qualify, with respect to

manned free balloons, the requirements in Section 45.11(a) that deal with the location of the identification plate. Accordingly, the proposal is adopted without substantive change.

Proposal 8-109. No unfavorable comments were received on the proposal to amend Section 45.13 to correctly reference Sections 45.11(a) and (b) with regard to identification plate requirements. Accordingly, the proposal is adopted without substantive change.

Proposal 8-110. A commenter representing a number of scheduled air carriers recommends that the words "inspection interval, or related procedure" be deleted from proposed Section 45.14. The supporting rationale is the same as submitted by this commenter concerning Proposal 8-3 to amend Section 21.31(c). As discussed under Proposal 8-3, the FAA disagrees.

The language in Section 45.14 covers rotorcraft as well as airplanes, balloons, engines, and propellers. To make this clear, the word "Rotorcraft" is changed to "Manufacturer's".

Two commenter object to proposed Section 45.14 on the grounds that it would be impracticable to mark small parts with a part and serial number. The FAA is not aware that the marking of small parts under current Section 45.14 has presented a problem. In any event, the rule allows markings that are equivalent to part and serial numbers, such as symbols enabling the identification of the part as one for which a replacement time, inspection interval, or related procedure is specified in an Airworthiness Limitations section. Identification of such parts is clearly essential for safety. Accordingly, Section 45.14 is adopted as revised.

Proposal 8-111. A commenter representing a number of scheduled air carriers recommends that the words "inspection interval, or related procedure" be deleted from proposed Section 91.163(c). The supporting rationale is the same as that submitted by this commenter concerning Proposal 8-3 to amend Section 21.31(c). As discussed under Proposal 8-3, the FAA disagrees. However, Section 91.163(c) is revised to specifically identify the acceptable alternatives to compliance with the "Airworthiness Limitations" section.

The language in proposed Section 91.163(c) covers rotorcraft as well as airplanes, balloons, engines, and propellers. To make this clear, the word "Rotorcraft" in Section 91.163(c) has been changed to "Manufacturer's", and a statement has been added that operations specifications approved by the Administrator may be used in lieu of the Instructions for Continued Airworthiness. Section 91.163(c) is adopted as revised.

Proposal 8.112. No unfavorable comment was received on the proposal to amend Section 91.165 to clarify maintenance personnel entries in maintenance records. Accordingly, the proposal is adopted without substantive change.

Proposal 8-113. Several commenters object to Sections 91.173(a)(2)(i) and (iii). A commenter states that adoption of the proposal would result in an inconsistency between Section 91.173 and Section 121.380, which contains the recordkeeping requirements for aircraft maintained under Part 121. The commenter also states that this inconsistency would cause great difficulty and economic hardship whenever an aircraft is sold by a Part 121 operator to a Part 91 operator and the Part 91 aircraft is maintained by a Part 121 operator under its repair station certificate. According to the commenter, the economic hardship would occur to both the Part 91 operator and the repair station. The same commenter contends that reliability information accumulated in recent years on transport category airplanes shows that there is no need for individualized total time records on equipment and components. Another commenter states that proposed requirements would result in large increases in maintenance costs for Part 91 operators and that only those components that are life-limited should have to carry total times.

The FAA concludes, however, that revision of Section 91.173(a)(2)(i) would contribute significantly to safety with little burden on those affected. The currently prescribed record of total time in service for the airframe does not generally apply to the aircraft's engines or propellers, since these components are frequently overhauled (or replaced) at different times. As a practical matter, it is known that operators of such aircraft normally keep records from which the total time in service of engines and propellers can be derived. Therefore, the FAA does not agree that the requirement to keep total times on engines and propellers would be a hardship and burden upon the operators. Accordingly, Section 91.173(a)(2)(i) is adopted without change.

In light of the comment on proposed Section 91.173(a)(2)(iii), the FAA has given further review of the proposal and has concluded that existing requirements satisfy the objective of the proposal. Accordingly proposed Section 91.173(a)(2)(iii) is withdrawn.

The reporting and recordkeeping requirements contained in Section 91.173 have been approved by the Office of Management and Budget in accordance with the Federal Reports Act of 1942.

Proposal 8-114. Several commenters agree with the intent of proposed Section 91.193(c)(4) but suggest changes. A commenter suggests that the proposed installation instructions for hand fire extinguishers would be more appropriately placed in the type certification rules. The FAA does not agree. New type certification rules do not apply to aircraft already in service.

A commenter suggests that the words "unless obvious" be added to clarify when the hand fire extinguisher stowage provisions must be properly identified. The FAA agrees.

Proposed Section 91.193(c)(4) is revised and adopted accordingly.

Proposal 8-115. One commenter objects to the proposal to revise Section 91.197(a) to require passenger information signs to meet the requirements of Section 25.791. The commenter states that it is unnecessary, in many small general aviation aircraft operating under Subpart D of Part 91, to have such signs just for the sake of uniformity. The commenter also states that "nonstandard" signs now in use are wholly adequate to meet the needs of the type of operation. Finally, the commenter points out that installation costs for aircraft not currently having signs would be high and the pilot could just as easily announce the information as he could activate the signs.

Based on these comments and considering the type of operation involved, the FAA finds that the benefits associated with the proposal do not warrant its adoption. The proposal to revise Section 91.197(a) is withdrawn.

Proposals 8-116, 8-117, 8-118, and 8-119. Final action on Proposals 8-116, 8-117, 8-118, and 8-119 was taken in Airworthiness Review Program, Amendment No. 8: Cabin Safety and Flight Attendant Amendments (45 FR 7750; February 4, 1980).

Proposal 8-120. In light of the need to conduct further testing of protective breathing equipment, the FAA withdraws its proposal to amend Section 121.337, which will be addressed in an upcoming notice of proposed rule making.

ADOPTION OF THE AMENDMENT

Accordingly, Parts 11, 21, 23, 25, 27, 29, 31, 33, 35, 43, 45, and 91 of the Federal Aviation Regulations are amended, effective October 14, 1980.

(Sections 313(a), 601, 603, and 604 of the Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1424)); and Section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)))

The FAA has determined that this document involves a regulation which is not significant under Executive Order 12044, as implemented by Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A copy of the final evaluation prepared for this document is contained in the docket. A copy of it may be obtained by writing to the individual and address listed in the "For Further Information Contact" paragraph.

Amendment 21-51A

Airworthiness Review Program; Amendment No. 8A: Aircraft, Engine, and Propeller Airworthiness, and Procedural Amendments; Correction

Adopted: December 19, 1980 Effective: December 29, 1980

(Published in 45 FR 85597, December 29, 1980)

SUMMARY: These amendments correct certain minor omissions and typographical errors noted in Airworthiness Review Program No. 8A, Amendment Nos. 11-20, 21-51, and 45-12. These amendments are necessary to express correctly the FAA's intended statement of the rules, and to publish the correct effective date for new section 21.50(b).

FOR FURTHER INFORMATION CONTACT: Marvin J. Walker, Regulatory Review Branch, AVS-22, Safety Regulations Staff, Associate Administrator for Aviation Standards, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591, Telephone: (202) 755-8714.

SUPPLEMENTARY INFORMATION: On September 11, 1980, Amendment Nos. 11-20 (45 FR 60170), 21-51 (45 FR 60170), and 45-12 (45 FR 60183) were published in the FEDERAL REGISTER. A review of those amendments shows that there were minor typographical errors and omissions, and that immediate amendments are needed to correct the amendments. The reasons for each of the amendments are explained below:

1. Section 11.49. There were two omissions and one typographical error in this section. Section "11.49(b)(4)" should be "11.49(b)(3)", and the words "is delegated" should be inserted after the word "chapter" in section 11.49(b)(3) to be internally consistent with section 11.49(b). The period at the end of section 11.49(b)(2) is replaced by a semicolon and the word "and".

2. Section 21.50. In section 21.50(b) the date "October 14, 1981" was a typographical error. Consistent with Notice 75-31 (40 FR 29412) the date should have been October 14, 1980 (the effective date of Amendment 21-51). In order to give the notice required by the Administrative Procedure Act, the date has been amended to "January 28, 1981" (30 days after effective date of this amendment).

3. Section 45.11. In section 45.11(a) the reference to section 43.13 was a typographical error. The reference to section 43.13 should be section 45.13.

Since these amendments are clarifying and editorial in nature and implement changes required to carry out the intent of amendments to Parts 11, 21, and 45, and impose no additional burden on any person, I find that notice and public procedure are unnecessary and that good cause exists for making them effective

in less than 30 days.

THE AMENDMENTS

Accordingly, Parts 11, 21, and 45 of the Federal Aviation Regulations are amended effective December 29, 1980.

Sections 313(a), 601, 603, and 604, Federal Aviation Act of 1958 (49 U.S.C. 1354(a), 1421, 1423, and 1424); section 6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)).

NOTE: The FAA has determined that this document involves a regulation which is not significant under Executive Order 12044, as implemented by DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). Since this regulatory action involves amendments that are corrective and editorial in nature, and does not modify the substance of the regulation contemplated under the final rule, the anticipated impact is so minimal that it does not warrant preparation of a regulatory evaluation.

Amendment 21-52

Operating Limitations and Related Requirements for Certain Propeller-Driven, Small Airplanes Designed for Agricultural Aircraft Operations or Fire Fighting Purposes

Adopted: September 30, 1980 Effective: November 10, 1980

Applicability date: For operation of affected airplanes that do not have flight time, as specified, before January 1, 1980, and for which certificates and approvals are issued after the effective date of this rule.

(Published in 45 FR 67064, October 9, 1980)

SUMMARY: This amendment prescribes requirements governing operation of certain propeller-driven, small airplanes, that are excluded from the applicability of noise level rules because they are designed for agricultural aircraft operations or for dispensing fire fighting materials. It applies to operation of newly produced airplanes (without flight time before January 1, 1980), and acoustically changed airplanes (without flight time in the changed design before January 1, 1980), that have not been shown to comply with Part 36 noise levels. It prohibits operation of the affected airplanes except for those operations that are directly associated with the work activity for which they are designed. The amendment also requires that an operating limitation be appropriately provided to the pilot. Under the amendment, on and after its effective date, the FAA will not issue an original standard airworthiness certificate or approve any "acoustical change" of those airplanes unless the operating limitation is provided as required. Experience indicates that

this amendment is needed to ensure that the affected newly produced and acoustically changed aircraft that take advantage of the agricultural and fire fighting exception in the noise certification rule, are not used for purposes for which the exception was not intended.

FOR FURTHER INFORMATION CONTACT:

Mr. Richard N. Tedrick, Noise Policy and Regulatory Branch (AAE-110), Noise Abatement Division, Office of Environment and Energy, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; telephone (202) 755-9027.

SUPPLEMENTARY INFORMATION:

Regulatory History

This amendment is based upon a Notice of Proposed Rule Making (Notice No. 76-27) published in the FEDERAL REGISTER on December 23, 1976 (41 FR 56065). As discussed in that Notice, it was issued in response to the U.S. Environmental Protection Agency's (EPA) recommended noise regulations for propeller-driven, small airplanes (adopted in part under amendments also published in the FEDERAL REGISTER on December 23, 1976 (41 FR 56065). Pursuant to Section 611(b) of the Federal Aviation Act of 1958, as amended, the FAA has consulted with the Secretary of Transportation and EPA concerning this amendment.

Background

Part 36 of the Federal Aviation Regulations (FAR) contains noise standards for type design and airworthiness certification, and approvals of acoustical changes of certain propeller-driven, small airplanes. Those standards, contained in Subpart F and Appendix F of Part 36, do not apply to airplanes designed for agricultural aircraft operations (as defined in FAR Section 137.3, effective January 1, 1966) or for dispensing fire fighting materials (see, Section 36.1(a)(2). Complementary procedural provisions are prescribed in Sections 21.93(b) and 21.183(e)(2) of FAR Part 21.

For aircraft in those two classes, the rules permit certification and changes in certification without showing compliance with the noise limits under Appendix F. However, the environmental impact of the exclusion is minimized for aircraft in the restricted category because those aircraft are subject to FAR Section 91.39 which prohibits operations other than those necessary for the accomplishment of the work activity for which the restricted category airplanes were designed. That limitation does not apply to agricultural and fire fighting airplanes that are type certificated in categories other than restricted and, thus, have standard airworthiness certificates. That allows those propeller-driven, small airplanes with standard airworthiness certificates to engage in operations not related to

the accomplishment of agricultural or fire fighting activities even though they were excepted from Part 36 noise requirements solely because of the strong public interest in agricultural and fire fighting activity. This has the potential for circumventing the reason for the limited exception for agricultural and fire fighting airplanes in Section 36.1(a)(2).

Therefore, the FAA proposed this amendment to limit operation of utility, acrobatic, and transport category airplanes that take advantage of that exception to those associated with the work activity for which they were designed. The affected airplanes, under this amendment, may still engage in operations other than those directly associated with the activity for which they were designed but only if they, like other propeller-driven, small airplanes, have been shown to comply with the otherwise applicable noise standards of Appendix F of Part 36. This rulemaking also amends the certification procedures in Part 21 and the noise regulation in Part 36, to reflect the new operating limitation under new Section 91.56 under Part 91. Those amendments to Sections 21.93(b) and 21.183(e)(2) govern the original issuance of standard airworthiness certificates and acoustical change approvals for the affected airplanes that do not have flight time before January 1, 1980. Under the rule, those certificates will not be issued and those approvals will not be given after the effective date of this rule unless the statement required under FAR Section 36.1583 is provided. Those changes are discussed in more detail in the "section-by-section analysis," below.

Discussion of Comments

Interested persons were invited to participate in this rulemaking proceeding by submitting their written comments to the regulatory docket on or before February 28, 1977. Due consideration has been given to the two comments received in the regulatory docket regarding Notice No. 76-27.

One commenter expressed concern about the proposal as it affects airplanes designed for agricultural purposes that are type certificated in categories other than restricted, and that have been excepted under Section 36.1(a)(2). The commenter stated that there may be a need or desire to type certificate such aircraft in the normal category for sale in the United States, as well as for export. The FAA agrees. This amendment does not prohibit manufacturers from certificating an affected airplane in the normal category if they should choose to do so. However, for airplanes without flight time before January 1, 1980, that have not been shown to comply with Part 36 noise standards, this amendment imposes an operating limitation that precludes their use in the United States for other than the purpose for which their certification was approved.

The EPA submitted a comment supporting this amendment for the reasons stated in proposing the rule.

Evaluation of Impacts

The economic and technological impacts of this amendment have been considered pursuant to Section 611(d) of the Federal Aviation Act of 1958, as amended. Since this amendment only limits the use of a small number of airplanes to the agricultural and fire fighting operations for which they were designed, its regulatory and economic impact is minor. In deciding whether to purchase or modify an airplane covered by the rule, the operator should consider the impact of limiting the operation of the airplane to its special purpose. That restriction is the reasonable consequence of operating an airplane which has not been shown to meet the otherwise applicable noise level requirements. One anticipated consequence is an increased incentive to show, whenever possible, that the airplane complies with those requirements rather that accept the operating limitation. Such a result is fully consistent with the noise control objective of Section 611 of the FA Act.

The environmental benefit of this rule is the limiting of a small class of agricultural and fire fighting airplanes to those operations for which they are designed (unless they comply with the otherwise applicable noise standards). This will result in slight reductions in noise exposure, but should have little or no effect on aircraft emissions or fuel consumption compared with the effects of current rule.

Section-by-Section Analysis

Part 21

Part 21 contains the procedures for the certification of products and parts. Subparts D and H of Part 21 prescribe procedures that govern the FAA approval of changes to type certificates and issuance of airworthiness certificates, respectively. Section 21.93 governs the different classes of type certificate changes. For propeller-driven, small airplanes in the normal, utility, acrobatic, transport, and restricted categories, Section 21.93(b)(3) defines those changes in type design that are "acoustical changes" (and that must, therefore, be shown not to increase the noise levels of the airplanes above specified limits). The applicability of "acoustical change" provisions currently exclude "airplanes that are designed for 'agricultural aircraft operations'...or for dispensing fire fighting materials." Section 21.183(e)(2), concerning original issue of standard airworthiness certificates, contains an identical exclusion. The effect of those exclusions is that any type design change, which would otherwise be an 'acoustical change' may be approved and standard airworthiness certificates may be issued for those special purpose airplanes without showing compliance with the otherwise applicable noise standards for propeller-driven, small airplanes. The FAA has found that those exclusions are warranted by the strong public interest in agricultural and fire fighting aircraft operations and the need for high power levels for the safe conduct of those operations.

However, aircraft excepted from compliance with Part 36 solely because of their agricultural and fire fighting capabilities should be limited to activities related to agricultural and fire fighting operations. Thus, under this amendment to Part 91, in order to conduct operations not related to agricultural and fire fighting operations, those airplanes are required to comply with the noise limits that apply to airplanes that do not qualify for the exclusion.

Notice No. 76-27 did not expressly propose to regulate the original issue of standard airworthiness certificates as it did acoustical change approvals. However, since under the amendment noncomplying airplanes certificated in the categories that have standard airworthiness certificates cannot be operated in the United States if the airplane did not have flight time before January 1, 1980, FAA's original issuance of a standard airworthiness certificate could be misunderstood as authorizing operation contrary to the prescribed operating limitation. Thus, this amendment includes amendments to Sections 21.93(b) and 21.183(e)(2) to reflect the Part 21 operating limitation by precluding FAA issuances and approvals covered by those sections for the affected airplanes unless the operating limitation required under Section 36.1583 is provided. By so doing, the regulation of the issuance of the type certificates is unnecessary since the operator of each affected airplane will have been provided the applicable operating limitation. Notice No. 76-27 proposed to add the words "and for which no requirements are prescribed in Part 36 of this chapter" to reflect the limitation on the operation of those airplanes provided in the required operating limitation under Section 36.1583. The intent and significance of that addition is clarified in this amendment by express reference to the applicability of Section 36.1583 requirements, including flight time before January 1, 1980, rather than to Part 36 generally.

In Amendment 36-7 (42 FR 12360; March 3, 1977), the acoustical change provisions for propeller-driven, small airplanes were redesignated as Section 36.9. Inadvertently, the cross reference to those provisions under Section 21.115(a) was not also changed at that time to fully reflect for the effects of Amendment 36-7. Thus, Section 21.115(a) is editorially amended to achieve that result.

Part 36

Part 36 contains noise standards for the certification of aircraft. This amendment changes the applicability of Part 36 noise standards concerning the issuance of changes to type certificates (acoustical changes) and original standard airworthiness certificates for the affected propeller-driven, small airplanes. Thus, Section 36.1(a)(2) is amended to reflect the applicability of Part 36, to those agricultural and fire fighting propeller-driven, small airplanes to which the Part 36 operating limitation provisions apply.

Subpart G of Part 36 contains operating limitations and information requirements for aircraft certificated under Part 36. In part, the purpose of operating limitations issued under Subpart G is to establish, during certification of the airplane, noise related requirements that must later be complied with by the operator of the airplane. As proposed in the notice, this amendment adds a new Section 36.1583, entitled "¢n|oncomplying agricultural and fire fighting airplanes." This new section provides that a specified statement must be provided in each noncomplying airplane that does not have flight time before January 1, 1980 (for newly produced airplanes), for flight time before January 1, 1980, in the changed configuration (for acoustically changed airplanes). The statement indicates that the airplane has not been shown to comply with the applicable noise limits in FAR Part 36 and must be operated in accordance with FAR Section 91.56. That statement must be furnished in the manner prescribed in Section 36.1581, which specifies the conditions under which information must be furnished in the approved portion of the Airplane Flight Manual or in other approved manual material, markings, or placards. Under the rule before this amendment, the only information required to be furnished under Section 36.1581 is that approved under Section 36.1501. The statement required by new Section 36.1583 is in addition to that information. To assure consistency, Section 36.1581 is also amended by adding a reference to the statement required by Section 36.1583. It should be noted that the operating limitation will be required by Section 36.1583 only for airplanes for which an original issue standard airworthiness certificate is issued or an acoustical change approval is given after the effective date of this amendment.

Part 91

This amendment adds a new Section 91.56 to Subpart A of Part 91, the general rules that govern the operation of aircraft. In a manner similar to the rules for restricted category aircraft in Section 91.39, new Section 91.56 requires that agricultural and fire fighting, propeller-driven, small airplanes (having standard airworthiness certificates) that have not been shown to comply with the noise limits in Part 36, may not be operated except as specified. Three situations are provided which prescribe how the noncomplying airplane may be used-(1) to the extent necessary to the work activity directly associated with the agricultural or fire fighting purpose for which it is designed; (2) to provide flight crewmember training in the "special purpose operation for which the airplane is designed"; and (3) to conduct "nondispensing aerial work operations" in accordance with the requirements under Section 137.29(c) of Part 137. Aircraft operations between bases of operation and work sites for the sole purpose of conducting the special purpose operation (and returning) are considered under the rule as part of the permissible "work activity."

Adoption of the Amendment

Accordingly, Parts 21, 36, and 91 of the Federal Aviation Regulations (14 CFR Parts 21, 36, and 91) are amended, effective November 10, 1980.

(Sec. 307(c), 313(a), 601(a), and 611(b), Federal Aviation Act of 1958, as amended (49 U.S.C Sections 1348(c), 1354(a), 1421, and 1431(b)); Sec. 6(c), Department of Transportation Act (49 U.S.C. Section 1655(c)); Title I of the National Environmental Policy Act of 1969 (42 U.S.C. Section 4321, et seq.); and Executive Order 11514, March 5, 1970.)

NOTE: The Federal Aviation Administration has determined that since this document involves a regulation based on a notice of proposed rulemaking issued before the effective date of the Department of Transportation Regulatory Policy and Procedures (44 FR 11034; February 26, 1979) implementing Executive Order 12044, the Department of Transportation Order does not apply. Further, this document does not contain a major proposal requiring preparation of an Economic Impact Statement under Executive Order 11821 or 11949 or OMB Circular A-107, which were superseded by Executive Order 12044.

Amendment 21-52A

Operating Limitations and Related Requirements for Certain Propeller Driven Small Airplanes Designed for Agricultural Aircraft Operations or Fire Fighting Purposes; Correction

Adopted: November 20, 1980 **Effective: November 10, 1980**

(Published in 45 FR 79009, November 28, 1980)

SUMMARY: On October 9, 1980, the FAA published its final rule prescribing requirements relating to certification and operation of certain propeller-driven, small airplanes designed for agricultural aircraft operations or fire-fighting purposes (45 FR 67064). That action included an amendment to section 21.115(a), as discussed in the preamble. However, on 45 FR 67066 in the statement of Amendment No. 2, it inadvertently indicated that paragraph (c) of section 21.115 was being amended rather than paragraph (a). Efforts to correct that error before it was published were not successful. Accordingly, this action makes the necessary correction, effective November 10, 1980, the effective date of the final rule.

FOR FURTHER INFORMATION CONTACT:

Mr. Richard N. Tedrick, Noise Policy and Regulatory Branch (AEE-110), Noise Abatement Division, Office of Environment and Energy, Federal Aviation Administration, 800 Independence Ave., S.W., Washington, D.C. 20591: telephone (202) 755-9027.

SUPPLEMENTARY INFORMATION:

Since this amendment to the final rule is corrective in nature to reflect the intended amendment as discussed in the preamble to the final rule, I find that further notice and public procedure thereon is unnecessary and that good cause exists for making it effective in less than 30 days after its publication in the FEDERAL REGISTER.

Adoption of the Amendments

Accordingly, section 21.115(a) of the Federal Aviation Regulations (14 CFR 21.115(a)) is amended effective November 10, 1980, by deleting the words "section 36.7" and substituting for them the words "sections 36.7 and 36.9."

(Secs. 307(c), 313(a), 601(a), and 611(b), Federal Aviation Act of 1958, as amended (49 U.S.C. sections 1348(c), 1354(a), 1421, and 1431(b)); Sec. 6(c), Department of Transportation Act (49 U.S.C. section 1655(c)); Title I, National Environmental Policy Act of 1969 (42 U.S.C. section 4321, et seq.); and Executive Order 11514, March 5, 1970).

NOTE: The FAA has determined that this document involves a regulation which is not significant under Executive Order 12044, as implemented by DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). Since this regulatory action involves amendments that are corrective and editorial in nature and do not modify the substance of the regulation contemplated under the final rule, the anticipated impact is so minimal that it does not warrant preparation of a regulatory evaluation.

Amendment 21-53

Type Certification Procedures for Gliders

Adopted: January 12, 1981 **Effective: January 15, 1981**

(Published in 46 FR 3494, January 15, 1981)

SUMMARY: This amendment provides a revision to the procedural rules for the type certification of gliders (including sailplanes) to permit equivalency findings with respect to the applicable airworthiness standards as is now permitted in the type certification of other aircraft. These procedural rules would also be applicable to the type certification of fixed-wing, self-launching (powered) gliders. This updating of the Federal Aviation Regulations eliminates an inconsistency in the regulations and, without any derogation of safety, an unnecessary economic burden which was previously imposed on this segment of sport aviation.

FOR FURTHER INFORMATION CONTACT:

Mr. Marvin Walker, Regulatory Review Branch (AVS-22), Safety Regulations Staff, Associate Administrator for Aviation Standards, 800 Independence Avenue, SW., Washington D.C. 20591. Telephone (202) 755-8714.

SUPPLEMENTARY INFORMATION:

This amendment is based on Notice 80-17 which was published in the FEDERAL REGISTER on October 14, 1980 (45 FR 67677) and revises the procedural rules in Section 21.23 of the Federal Aviation Regulations (FAR) for the type certification of gliders.

Section 21.23 of the Federal Aviation Regulations (FAR) provided that an applicant is entitled to a type certificate for a glider if the applicant submits the type design, test reports, and computations necessary to show that the glider meets the applicable regulations and there is no unsafe feature or characteristic of the glider. The applicable regulations were defined in Section 21.23(a) to be those airworthiness requirements of Part 23 or Part 27 of the FAR that the Administrator finds to be (1) appropriate for gliders and (2) applicable to the applicant's specific type design. No provisions were made for gliders which may not meet all of the applicable airworthiness requirements of Part 23 or Part 27, although the provisions not complied with are compensated for by factors in the glider's type design that provide an equivalent or greater level of safety. The procedural requirements for the type certification of gliders were unique in this respect. The type certification procedures applicable to all other aircraft specifically provide for such equivalency, and there did not appear to be any justification for the restriction against the use of designs which provide an equivalent level of safety with respect to certification of basically a sport aircraft operated for pleasure and not for compensation or hire.

Accordingly, the FAA proposed to amend Section 21.23(a) to permit the issuance of type certificates for gliders (including sailplanes), including fixed-wing, self-launching (powered) gliders, that comply with either the applicable airworthiness requirements of Part 23 or 27 of the Federal Aviation Regulations or such other airworthiness criteria that provide an equivalent level of safety to those requirements.

Specifically, this amendment permits the development and use of comprehensive and detailed criteria for the type certification of gliders, provided the Administrator finds that to the extent the criteria does not meet the applicable airworthiness requirements of Part 23 or Part 27, it provides an equivalent level of safety to those requirements. Simultaneous with the issuance of this amendment, the FAA is issuing new Advisory Circular (AC) No.21.23-1 to approve two comprehensive and detailed criteria, but not the only criteria, that may be used by an applicant for the type certification of fixed-wing gliders (sailplanes), including self-launching gliders. A draft of

AC 21.23-1 was published in the Federal Register (45 FR 67818) for comment on October 14, 1980, along with NPRM 80-17.

AC 21.23-1 identifies the European Joint Airworthiness Requirements (JAR-22) for Sailplanes and Powered Sailplanes, when supplemented by certain FAA criteria, as acceptable criteria for the type certification of gliders pursuant to Section 21.23 as amended. This amendment, together with the issuance of AC 21.23-1, is responsive to a petition for rulemaking filed by the Soaring Society of America requesting FAA to adopt JAR-22.

Discussion of Comments

All commenters expressed agreement with the proposals contained in Notice 80-17. Many commenters simultaneously commented on the draft AC 21.23-1. Comments on the AC were outside the scope of Notice 80-17, but were considered in the development of the final AC.

One commenter questions the reference to Part 27 in Section 21.23(a). Section 21.23(a) previously referenced Part 27 to provide a basis to type certificate rotary wing gliders and the reference is retained in new Section 21.23(a) for that purpose.

Planned Glider Engine and Propeller Rule Making

The preamble of NPRM 80-17 stated that Part 33 and 35 of the regulations contains the certification requirements for engines and propellers, to be installed in gliders, i.e., self-launching (powered) gliders. New AC 21.23-1 provides criteria for approving engines and propellers as an integral part of the glider. This criteria has been found by the FAA to meet the applicable requirements of Parts 33 and 35 or to provide an equivalent level of safety to those requirements not complied with when approved as an integral part of a glider that meets the criteria in the AC. Such an approval does not constitute certification of the engine or propeller for installation on other gliders. The FAA plans to initiate rule making in the near future to add new Subparts to both Part 33 and Part 35 to establish specific requirements for the general type certification of glider engines and propellers. JAR-22, Subparts H and J, will be used as the basis for the proposed rule making.

Adoption of the Amendment

Since this rule imposes no burden on any person, allows alternate methods of compliance with established airworthiness standards and is in consonance with the spirit of Executive Order 12044, I find that good cause exists to make these amendments effective immediately. Accordingly, Part 21 of the Federal Aviation Regulations is amended effective January 15, 1981.

(Sections 313(a), 314, 601, 603, 604, 610, and 611 of the Federal Aviation Act of 1958, as amended (49 U.S.C. Sections 1354(a), 1355, 1421, 1423, 1424, 1430, and 1431); and Section

6(c) of the Department of Transportation Act (49 U.S.C. 1655(c)); and 14 CFR Part 11.)

NOTE. -- The FAA has determined that this document involves a regulation which is not significant under Executive Order 12044, as implemented by the Department of Transportation Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). A copy of the draft regulatory evaluation prepared for this action is contained in the regulatory docket. A copy may be obtained by contacting the person identified above under the caption: "**FOR FURTHER INFORMATION CONTACT**." Moreover, it has been determined that this rule will not have a significant economic impact on a substantial number of small entities.

This rule is a final order of the Administrator as defined by Section 1005 of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1485). As such, it is subject to review only by the courts of appeals of the United States or the United States Court of Appeals for the District of Columbia.

Amendment 21-54

Special Flight Permits

Adopted: July 1, 1981 **Effective: July 23, 1981**

(Published in 46 FR 37876, July 23, 1981)

SUMMARY: This amendment extends the eligibility for special flight permits with continuing authorization to all aircraft operated under the air taxi and commercial operator rules in Part 135 that are maintained under continuous maintenance programs. This action further implements the recent major change to Part 135 which requires certain aircraft to be maintained under continuous airworthiness maintenance programs; and grants to Part 135 operators the same benefits already accorded to certificate holders under Parts 121 and 127. Under the amended rule, operators of affected aircraft under Part 135 will be relieved of many economic burdens associated with excessive maintenance downtime and of administrative burdens imposed by the prior requirement for individual flight permits or regulatory exemptions. This regulatory change is in full accord with Executive Order 12291 in reducing the burden of existing and future regulations.

FOR FURTHER INFORMATION CONTACT:

Mr. Dan Keenan, Regulatory Projects Branch (AVS-22)
Safety Regulations Staff
Associate Administrator for Aviation Standards
Federal Aviation Administration
800 Independence Avenue, S.W.

Washington, D.C. 20591; Telephone (202) 426-8128.

SUPPLEMENTARY INFORMATION:

Background

Permitting the flight of aircraft which may not currently meet with all applicable airworthiness requirements for the purpose of accomplishing necessary maintenance or alterations is a practice of long standing, and FAA experience with this practice does not indicate that safety has been compromised. These flights are frequently advantageous and may be safely conducted under carefully selected operating conditions and appropriate restrictions.

The authorization for flight of such aircraft is procedurally granted in the form of a special flight permit which is an airworthiness certificate issued by FAA airworthiness inspectors, upon application of the registered owner or its agent. The permit imposes conditions to insure the safety of the proposed flight and to require a certified inspection of the aircraft by an appropriately certificated maintenance entity to confirm that the aircraft is safe for that flight.

Section 21.197 of the Federal Aviation Regulations (FAR), recodified from Section 1.76 of the Civil Air Regulations (CAR), basically provides that upon application by the registered owner or agent, a special flight permit may be issued for an aircraft that may not meet applicable airworthiness requirements, but is capable of safe flight for specified purposes. Section 21.199, recodified from CAR Section 1.77, prescribes the method for issuance of special flight permits by the FAA airworthiness inspectors assigned to the FAA field office responsible for activities in the area where the intended flight is to originate.

Under that portion of the rule which has been in effect for over 25 years, a separate permit is required for each flight. The permit imposes conditions and limitations to insure an adequate level of safety for the proposed operation, including certification by an appropriately certificated person that the aircraft has been inspected and found safe for the intended flight.

On October 25, 1967, the FAA proposed to relax the separate permit requirement by extending the authority to allow a special flight permit to be issued with continuing authorization. That proposal made all Part 121 and Part 127 operators eligible to request a special flight permit that could be used repeatedly. The proposal became effective September 21, 1968, as Section 21.197(c) in Amendment 21-22. That rule change was initiated by several requests from air carrier certificate holders for authority to issue their own ferry permits, under certain specifically controlled circumstances. The petitioners indicated that a special flight permit with a continuing authorization for such holders would be economically and administratively

beneficial without derogating safety. Experience indicated that certain problems which necessitated the ferrying of aircraft reoccurred sufficiently often to justify granting to the operator a special flight permit with continuing authority to enable the ferrying of aircraft in those recurring situations. The Part 121 and Part 127 certificate holders, by virtue of FAA supervised continuous airworthiness maintenance programs, are in a position to establish procedures, for necessary flights to a maintenance base, that will assure an adequate level of safety. Requiring a separate application for each ferry flight, as was previously necessary, placed a burden upon both the certificate holder and the FAA, where each request was required to be handled individually with the FAA assigned maintenance inspector.

There is a distinct relationship between continuous airworthiness maintenance programs and special flight permits with continuing authorizations. Specifically, both are dependent on formal management controls by the certificate holder in conjunction with the assignment of primary responsibility for airworthiness of aircraft subject to those programs. In addition, these certificate holders have internal communications systems which lend themselves to expeditious and accurate processing of the permit and related information. The FAA issues a permit with continuing authorization to each certificate holder in the form of operations specifications which impose conditions and limitations commensurate with the characteristics of their operations and their administrative capabilities.

The next development in amending special flight permit requirements for air carriers occurred on April 5, 1976, when the FAA proposed extending the authority of Section 21.197(c) to allow operators of large aircraft under Section 135.2 to apply for special flight permits with continuing authorization. The rationale for this action was that aircraft operated under Section 135.2 had to be maintained under a continuing airworthiness maintenance program in accordance with Part 121 and, therefore, were subject to the same high level of control. That proposal was adopted in Amendment 21-45, effective October 28, 1977.

In December 1978, Part 135 was substantially revised to require that aircraft with 30 passenger seats or less, or a maximum payload capacity of 7,500 pounds be operated and maintained under Part 135. Further, it requires that aircraft operated under Part 135 with 10 or more passengers be maintained in accordance with continuous airworthiness maintenance programs and that aircraft with nine or less passengers could be so maintained upon election of the operator. In effect, the now current maintenance requirements for these aircraft satisfy the established eligibility criteria that have been applied to other air carriers for special flight permits with continuing authorization.

The Proposal and Discussion of Comments

The FAA has processed a number of petitions for exemption from Part 135 operators to allow issuance to them of special flight permits with continuing authorization. In granting the exemptions as being in the public interest, the FAA agreed with the operators that aircraft maintained under continuous airworthiness maintenance programs could be given such permits with no adverse effect on safety. It was also shown that under the regulation requiring individual flight permits, the operators were subject to economic penalties due to excessive aircraft downtime for maintenance items resulting from the requirement to get individual ferry approvals from FAA offices that in many cases were distantly located or closed during non-working hours. In many situations where operators believed they could not get timely FAA ferry approval, they perceived their only alternative was the relatively expensive one of transporting maintenance personnel to the remotely located aircraft that required service. Finally, even in cases where individual permits could be readily obtained, the procedure imposed an administrative burden on both the operator and the FAA.

Based on the number of petitions for exemption, the considerations that led to grants of exemption, and the overall regulatory policy of granting the same relief to all certificate holders that had been given by exemption to a few, the FAA proposed in Notice 80-23(45 FR 80450; December 4, 1980) that the eligibility for a special flight permit with continuing authorization be extended to all Part 135 operators. Accordingly, the notice proposed to amend Section 21.197(c) by deleting the special provision for large aircraft operating under Section 135.2 and substituting instead an eligibility provision covering all Part 135 aircraft operated and maintained under a prescribed continuous airworthiness maintenance program.

The proposed amendment to Section 21.197 is one of 32 proposed changes contained in Notice 80-23. The other proposals of Notice 80-23 do not relate to special flight permits and will be dealt with in other rulemaking actions.

Three comments were received on the proposal. All of the commenters concurred in the proposal; however, one commenter recommended further extending the eligibility to manufacturers to allow them to ferry uncertificated (i.e., "green") aircraft from one manufacturing facility to another. This suggestion is beyond the scope of the notice since the proposal was clearly limited to Part 135 operators flying aircraft to a base where maintenance or alterations are to be performed. Moreover, the commenter did not explain why manufacturers need such a permit or why current procedures are inadequate.

Discussion of the Amendment

The revision of Section 21.197 adopted by this amendment is

the same as the one proposed in Notice 80-23. Under the amendment, the specific guidelines, conditions, and limitations for administering the authorization for certificate holders under Part 135 will be identical to those for certificate holders under Parts 121 and 127. Procedurally, the special flight permit with a continuing authorization will be issued as an amendment to the certificate holder's operations specifications using the certificate holder's manual for amplification. The special flight permit with continuing authorization will eliminate the considerable economic and administrative burden on the certificate holders under Part 135, and the affected FAA elements associated with individual special flight permits needed for ferrying aircraft to bases where maintenance can be performed. Through approval of the certificate holder's continuous airworthiness maintenance programs, by setting conditions and limitations in operations specifications, and by prescribing detailed instructions in the certificate holder's manual, the FAA's issuance of special flight permits with continuing authorization afford an equivalent level of safety to that established when the FAA issues individual special flight permits. It should be noted that no flight conducted under a special flight permit with a continuing authorization will involve carriage of passengers.

Based upon its experience with Parts 121 and 127 operators, the FAA concludes that allowing air taxi operators the same rights to be eligible for continuing authorization of special flight permits is in the public interest. It will allow a segment of the aviation industry that maintains its aircraft under a continuous airworthiness maintenance program the same rights as other segments. The rule does not grant blanket authority solely because the operator uses a continuous airworthiness maintenance program, but gives eligibility to all those operators. Special flight permits with continuing authorization will be granted on an individual operator basis, similar to those granted to Part 121 and Part 127 operators.

Adoption of the Amendment

Accordingly, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended effective July 23, 1981.

(Secs. 313(a), 314, and 601 Federal Aviation Act of 1958, as amended, (49 U.S.C. 1354(a), 1355, and 1421); Sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c); 14 CFR 11.49).)

NOTE: Since this amendment is relaxatory in nature and affects relatively few aircraft operators, it has been determined that this document (1) involves a regulation which is not a major rule under Executive Order 12291; (2) is not a significant rule pursuant to the Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979); and (3) under the criteria of the Regulatory Flexibility Act, promulgates a rule that will not have significant economic impact on a

substantial number of small entities.

A copy of the final regulatory evaluation for this action is contained in the public docket. A copy of that evaluation may be obtained by contacting the person identified above under the caption "**FOR FURTHER INFORMATION CONTACT**."

Amendment 21-55

Export Airworthiness Approvals

Adopted: August 19, 1981 **Effective: October 8, 1981**

(Published in 46 FR 44735, September 8, 1981)

SUMMARY: This amendment provides for the issuance of special export certificates of airworthiness for restricted category aircraft. As amended, the rule now permits an exporter to obtain such a certificate for a restricted category aircraft under the same procedures and with the same privileges applicable to aircraft having standard airworthiness certificates. By relieving regulatory requirements applicable to exporters of restricted category aircraft, this amendment facilitates foreign sale demonstration tours and gives potential for increased export sales. Under the new rule, upon the sale of an aircraft in a foreign country, exporters will be relieved of any costs associated with having to return the aircraft to the United States or applying to an overseas FAA office to obtain an export certificate of airworthiness or, alternatively, having to seek relief via the exemption process. This amendment is in response to the petition of a manufacturer who cites the burden imposed upon it and persons similarly situated under the preexisting rule. By easing the burden imposed on exporters of U.S.-manufactured restricted category aircraft, the revised rule is in full accord with Executive Order 12291.

FOR FURTHER INFORMATION CONTACT:

Mr. Joseph A. Sirkis, Regulatory Projects and Branch (AVS-24), Safety Regulations Staff, Associate Administrator for Aviation Standards. Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; telephone (202) 755-9716.

Notice

This amendment is based upon a Notice of Proposed Rule Making (Notice No. 80-20) published in the Federal Register on November 20, 1980 (45 FR 76868). All interested persons were afforded the opportunity to participate in the making of this regulation.

Background

Current export airworthiness procedures were first proposed in Federal Aviation Agency Notice No. 63-15 published on April 17, 1963 (28 FR 3728), as an amendment to Part 1 of the Civil Air Regulations (CAR). By the time the final rule was issued, however, Part 1 of the CAR had been recodified as Part 21 of the Federal Aviation Regulations (FAR), and the new amendment was issued as Subpart L of Part 21 (30 FR 8464; July 2, 1965).

Subpart L of Part 21 established eligibility criteria for the issuance of export certificates of airworthiness for aircraft in two situations: first, when an aircraft is to be exported to a particular foreign country; second, when an aircraft is to be flown to several foreign countries for the purposes of demonstration and eventual sale. In the first case, the exporter is eligible for an export certificate of airworthiness under Section 21.329 prior to the aircraft's departure from the United States. This export certificate of airworthiness, which is available for both standard and restricted category aircraft, certifies to a particular importing country that the aircraft conforms to its U.S. type certificate, that it complies with any special requirement notified by the importing country, and that it is in a condition for safe operation. However, this certificate is only valid in the country to which the aircraft is being exported.

In the second situation, under Section 21.339, the exporter of an aircraft that has a standard airworthiness certificate may obtain, prior to departure from the United States, a special export certificate of airworthiness covering sales demonstrations in any number of countries in which a prospective purchaser is sought. Upon finding a buyer, the exporter has, in hand, a valid export certificate of airworthiness to facilitate airworthiness acceptance by the country in which the aircraft is to be sold. This relieves the exporter of the need to return the aircraft to the United States or applying to an overseas FAA office for a certificate under Section 21.329. Section 21.339, which was adopted in 1965, inadvertently did not make this procedure available for restricted category aircraft sales. A restricted category aircraft is one intended for certain "special-purpose operations," such as agricultural users, and which is type certificated in accordance with Section 21.25 or CAR Part 8,i.e., meets the airworthiness requirements of an aircraft category except for those the Administrator finds inappropriate for the special purpose involved. Prior to 1965, export approvals were governed by the administrative procedures contained in FAA Manual of Procedures (MOP) 2-4. MOP 2-4, Part 1, paragraph 13, permitted issuance of "blanket" (equivalent to the current "special") export certificates of airworthiness for restricted category aircraft. Since there evidently was no intent to change the previous export airworthiness procedures on codification of the MOP into Section 21.339 in 1965, this amendment reinstates preexisting procedures by revising Section 21.339 to include eligibility of restricted category aircraft for special export certificates of airworthiness.

The FAR do not require an aircraft to have an export certificate of airworthiness to be exported. However, such a certificate greatly facilitates airworthiness acceptance of U.S. aircraft by importing countries, thus increasing the foreign sales potential of these aircraft. In accordance with the bilateral agreements between the United States and other countries, the certificate will be given the same validity by the importing country as a certificate issued by its own aviation authority. However, since the importing country has the prerogative to define the airworthiness requirements that must be met for import, this amendment does not guarantee import acceptance. Exporters should consult with the airworthiness authority in the importing country to determine the eligibility of restricted category aircraft and to determine what, if any, special/additional requirements must be met before assuming import acceptance.

Discussion of Comments

The FAA received two comments in response to Notice 80-20. These comments express the views of two associations, one representing the manufacturing industry, the other representing airline pilots. The former commenter supports the proposal as published. The latter commenter has no specific comments to offer. Neither comment received in response to Notice 80-20 was unfavorable.

Discussion of Amendment

This rulemaking action was initiated by a petition for rulemaking filed by the Grumman American Aviation Corporation of Elmira, New York. The petition requested that Section 21.339(a) be amended to permit issuance of special export airworthiness certificates for restricted category aircraft it manufactures and for products of other exporters similarly situated. The petitioner specifically cites the situation in connection with its Grumman Model G-164 series agricultural aircraft (Ag-Cat). In support of its request, the petitioner makes three basic arguments.

First, the petitioner contends that aircraft such as the Ag-Cat are needed throughout the world for the production and protection of food supplies. In connection with this point, the petitioner notes that extending the special certificate procedure would greatly facilitate exporting such aircraft and thereby help the U.S. balance of trade and that such an action would be in the U.S. public interest.

Second, the petitioner contends that excluding restricted category aircraft from the special certificate procedure places an unfair economic burden on the manufacturers.

Finally, the petitioner contends that permitting the procedure for restricted category aircraft would not compromise

safety since the aircraft are already eligible for an export certificate of airworthiness under Section 21.329(a).

With respect to the petitioner's first and second contentions, it is clear that procedures existing prior to this amendment caused an additional financial expense and delay when exporting a restricted category aircraft when compared to the procedures for exporting a standard category aircraft that is flown to several foreign countries for the purpose of sale. For example, additional expense and delays were incurred when a newly manufactured restricted category aircraft that was exported for demonstration to a particular country under Section 21.329 was sold to a person in another foreign country for which the aircraft did not have an export certificate of airworthiness. In the petitioner's case, the exporter incurred an expense of $5,000 because of storage and air transportation charges incidental to inspection by an FAA inspection representative from an overseas field office. This would not have been the case with aircraft having standard airworthiness certificates which were and currently remain eligible for a special export airworthiness approval under Section 21.339. Thus, the previous rule resulted in an inequitable situation for the exporter of a restricted category aircraft who would, for each sale in a foreign country, be subjected to delays and additional expense or alternatively be required to seek relief via the exemption process.

The FAA agrees with the petitioner's third contention that this amendment will not result in a reduction in safety. Under this amendment, any restricted category aircraft covered by the new procedure must meet the FAA requirements for a U.S. restricted category airworthiness certificate under Section 21.185. The aircraft must also, under Section 21.339(e), meet the importing country's special airworthiness requirements. Because these two requirements also appear in Section 21.329 for export certificates, the aircraft will be held to the same high standards of airworthiness that have always been required for export of restricted category aircraft.

The FAA has analyzed the possible impact of this amendment on the 23 bilateral airworthiness agreements (executive agreements) in effect between the United States and certain other countries concerning certificates of airworthiness for import aircraft. This amendment does not contravene any of those agreements, and it does not interfere with the right of the importing country to make acceptance of the special export certificate dependent upon the product's meeting any special/additional requirements which the importing country finds necessary to ensure that the aircraft meets a level of safety equivalent to that provided by its applicable laws, regulations, and requirements which would be effective for a similar aircraft produced in the importing country. There are a number of countries which place limitations on the import of restricted category aircraft; such limitations appear in those countries' "special requirements" (as published in FAA Advisory Circular 21-2) and under Section 21.339 must be met by any exporter. This

amendment, therefore, does not interfere with any country's internal rules. Nevertheless, in accordance with international agreements and Section 21.335(d), an operator of a U.S.-registered restricted category aircraft having a special export airworthiness approval must obtain permission from each country prior to flight in that country. Such permission need not be obtained as a condition of issuance of the special export airworthiness certificate but must be obtained prior to flight in any foreign country.

This amendment will eliminate the potential financial burden and delays associated with having to return the aircraft to the United States or applying to an FAA overseas field office to obtain an export certificate of airworthiness or, alternatively, having to seek relief via the exemption process. For these reasons, the amendment fully complies with and achieves the purposes of Executive Order 12291.

Regulatory Evaluation

The FAA conducted a regulatory evaluation which is included in the regulatory docket for this action. It is summarized below.

Costs

The FAA's analysis determines that there will be no cost impact on manufacturers and exporters of restricted category aircraft and only a minimal to negligible cost impact to the Government. The Government will incur minor cost in the revision of Section 21.339, which is considered already to be a part of FAA's ongoing program to simplify and ease the burden of the regulations.

Benefits

Implementation of this final rule is expected to provide benefits to FAA and to manufacturers and exporters of restricted category aircraft. Exporters of restricted category aircraft choosing to conduct foreign sale demonstration tours for the purpose of consummating a sale during the tour will benefit by being relieved of the burden of returning the aircraft to the United States or to an overseas FAA office to obtain a special export certificate of airworthiness valid in the country in which the aircraft has been sold. In addition, exporters may be encouraged to increase multination sales tours, with corresponding benefit from sales increases resulting from this additional approach to the marketing of their aircraft abroad. The FAA will benefit from the reduction in administrative costs associated with issuing special export certificates of airworthiness for restricted category aircraft to be sold potentially in more than one country.

Adoption of the Amendment

Accordingly, Section 21.339(a) of the Federal Aviation Regulations (14 CFR Section 21.339(a) is revised, effective October 8, 1981.

(Secs. 313(a), 601, and 603, Federal Aviation Act of 1958, as amended (49 U.S.C. 1354(a), 1421, and 1423; Sec. 6(c), Department of Transportation Act (49 U.S.C. 1655(c); and 14 CFR 11.49)

NOTE: The Federal Aviation Administration has determined that this document involves a regulation which is not a major rule under Executive Order 12291 or a significant regulation under the DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A copy of the final evaluation prepared for this action is contained in the regulatory docket. A copy of it may be obtained by contacting the person identified under the caption "**FOR FURTHER INFORMATION CONTACT**." It has been determined also that the amendment will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act since it is relieving in nature.

Amendment 21-56

Aircraft Noise Requirements; Amendment to Definition of "Acoustical Change" to Permit Temporary, Limited Engine/Nacelle Intermix for Turbojet Engine Powered, Transport Category Large Airplanes

Adopted: December 12, 1981 Effective: February 8, 1982

(Published in 47 FR 756, January 7, 1982)

SUMMARY: This action amends the definition of "acoustical change" in the aircraft noise certification rules as applied to turbojet engine powered, transport category large airplanes. The amendment permits the temporary installation and use (intermix) of different engines or nacelles changes or both, on a particular airplane for a 90 day period without further documentation of the noise levels, provided that the airplane is brought back into conformance with an acoustically certificated configuration for that airplane within 90 days of the initial change.

Under the previous rule, any voluntary change in type design of an airplane that might increase noise was an "acoustical change" and after the design change the airplane could not exceed specified noise levels. Thus, it was frequently necessary for aircraft manufacturers or operators to show that each possible engine/nacelle configuration combination complied with applicable noise levels, even if that configuration was only installed temporarily. They were also required to provide complete airplane flight manual materials approved by the FAA for each affected airplane. Those processes imposed a considerable manpower and paperwork obligation on the part of the manufacturer, the operator, and the FAA. The FAA's review showed

that potential increase in aircraft noise would be minimal and, thus, that the requirement was unduly restrictive. Accordingly, this amendment allows type design changes, that are limited to the engine, or nacelle, or both, where the airplane may be operated without such compliance for a period of not more than 90 days.

FOR FURTHER INFORMATION CONTACT:

Mr. Richard N. Tedrick, Noise Policy and Regulatory Branch (AEE-110), Noise Abatement Division, Office of Environment and Energy, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; telephone (202) 755-9027.

SUPPLEMENTARY INFORMATION:

Regulatory History

In accordance with FAR Part 11.25(c), the Air Transport Association of America (ATA) petitioned the FAA on January 4, 1980, for an exemption from FAR Part 21.93(b) and for an appropriate rule change to allow unlimited intermix on its members' operating fleets for a period of up to 90 days. A **SUMMARY** of that petition was published in the FEDERAL REGISTER for public information and comment on March 6, 1980 (45 FR 14590).

On January 26, 1981, the Federal Aviation Administration (FAA) published a Notice of Proposed Rulemaking, Notice No. 81-3 (46 FR 8347), proposing to amend the definition of "acoustical change" in the aircraft noise certification rules as applied to turbojet engine powered, transport category large airplanes. The Notice proposed permitting the temporary installation and use (intermix) of different engines or nacelles on a particular airplane for a 90 day period without further documentation of the noise levels, provided that the airplane is brought back into conformance with an acoustically certificated configuration for that airplane within 90 days of the initial change. Interested persons were invited to comment on the proposals contained in that Notice by March 27, 1981. All comments received were given full consideration in the promulgation of this amendment. Except as discussed below, this amendment adopts the proposals in Notice No. 81-3 without substantive change.

Pursuant to Section 611(b)(1) of the Federal Aviation Act of 1958, as amended (49 U.S.C. 1431) the FAA has consulted with the Secretary of Transportation and the U.S. Environmental Protection Agency (EPA) prior to the adoption of this amendment. An environmental assessment regarding this amendment has been prepared in accordance with applicable environmental review procedures. This amendment was submitted to the EPA in accordance with Section 309 of the Clean Air Act, as amended (42 U.S.C. 1857h-7).

Part 36 of the Federal Aviation Regulations "Noise Standards: Aircraft Type Certification" (34 FR 18355; November 18, 1969), which became effective December 1, 1969, originally prescribed noise measurement, evaluation, and level requirements for the issuance of type certificates, and changes to those certificates, for subsonic transport category large airplanes and for subsonic turbojet engine powered airplanes regardless of category and weight. That regulation initiated the regulatory noise abatement program of the FAA under the statutory authority of Public Law 90-411 (July 21, 1968), which added Section 611 to the Federal Aviation Act of 1958 (the "FA Act").

Synopsis of the Amendment

The purpose of this amendment is to change Section 21.93(b) of the FARs (14 CFR Part 21) to amend the definition of "acoustical change" as applied to turbojet engine powered, transport category large airplanes. The amendment is based upon a recommended change to the rule submitted in a petition for rulemaking under FAR Part 11 by ATA dated January 4, 1980. A **SUMMARY** of that petition was published in the FEDERAL REGISTER for public information and comment on March 6, 1980 (45 FR 14590). Section 21.93(b) previously defined "acoustical change" as any voluntary change in the type design of an airplane that might increase the noise levels of the airplane.

The petition requested an amendment to Section 21.93(b) so that temporary (less than 90 day) engine/nacelle intermixes for maintenance purposes on turbojet engine powered, transport category large airplanes would not be classified as "acoustical changes" and, thus, not be governed by the applicable requirements of Section 36.7 of Part 36. Petitioner's reasons for the amendment indicate that granting of the petition would have a minimum effect on individual airplane noise and an even lesser effect on national fleet noise level. Results would include significant cost savings, reduced spares inventory, better allocation of manpower resources, and reduced workload and paperwork burden on industry and government.

Aircraft Noise Rules

Public Laws 90-411, 92-574, 95-609, and 96-193 were enacted to provide the statutory basis for promulgating regulations providing present and future relief and protection to the public health and welfare from noise and sonic boom from civil aircraft. Under Section 611 of the FA Act, the FAA, after consultation with the Secretary of Transportation and the Administrator of the Environmental Protection Agency, is responsible for the adoption and amendment of rules which prescribe the necessary standards and regulations.

Since the adoption of FAR Part 36 in 1969, the FAA has issued a number of proposed amendments to its provisions and,

subsequent to notice and public procedure, adopted those amendments which have been found to be consistent with the provisions of Section 611 of the FA Act. Those amendments have increased the protection of the public health and welfare regarding noise and sonic boom. In addition to the FAR Part 36 airplane noise certification rules, the FAA has adopted rules governing how airplanes should be operated for noise control purposes. On March 28, 1973, the FAA published an amendment to Part 91 (Amendment 91-112; 38 FR 8051) to prohibit unauthorized operation of civil aircraft at supersonic speeds over the United States. Amendment 91-134 (41 FR 52388; November 29, 1976), amended Part 91 for noise abatement purposes to require that a pilot in command of a civil turbojet-powered airplane use the lowest authorized flap setting consistent with safety. Amendment 91-136 (41 FR 56046; December 23, 1976) added Subpart E to Part 91 to require phased compliance with the Part 36 noise limits by U.S. registered, civil subsonic turbojet engine powered airplanes with maximum weight of more than 75,000 pounds having standard airworthiness certificates and engaged in air commerce in the United States.

Need for Regulation

The need for this amendment stems from difficulties in complying with the current acoustical change provisions of FAR Section 21.93(b) when, for operational purposes, the airline operators must "intermix" engine configurations. The current rules require that each such configuration must be fully certificated for both safety (airworthiness) and noise, even though many configurations would only be employed for short periods. The FAA has determined that while the safety requirements are appropriate and necessary, the amount of paperwork burden on both industry and government for certificating temporary configurations for noise is unwarranted. Docket comments have also pointed out that the current rule is costly to the operators because it prohibits the use of certain spares that are otherwise approved from the airworthiness standpoint.

Industry data and FAA-sponsored research indicated that the increase in aircraft noise would be minimal and not have a significant impact. The FAA conducted an environmental assessment which resulted in a Finding of No Significant Impact. A copy of that finding is available in the public docket.

Comments and Responses

The FAA received 12 comments from interested persons including local government bodies, the aviation industry, aircraft owners, and airplane operators in response to Notice No. 81-3. Most commenters supported the proposal; however, several issues were raised. For example, suggestions were made concerning a specific language change and extending the time limit. Thus, the comments and FAA's response to them are discussed as follows:

Specific Language Change

Eight comments were received which expressed concern that the language in the notice did not correctly reflect the intent of the ATA's petition. Specifically, commenters questioned the design changes being limited to an "engine or nacelle change." The commenters recommended using the language suggested by the ATA in its original petition which was "engine and/or nacelle changes."

The FAA has given full consideration to the "and/or" provision. After reviewing the commenters' recommendations, the FAA has further clarified its intent by changing the wording from "or" to "engine or nacelle changes or both." In doing so, the definition of "acoustical change" provides increased flexibility in the use of airworthiness approved 90-day engine/nacelle intermixes.

Time Limits

Three comments were received on this feature of the proposal, with one supporting the 90 day time limitation.

Another commenter expressed his opinion that the ATA's petition included the time limit as a concession to environmental pressures. The commenter also mentioned that perhaps there was a need for a relaxed limit of 180 or 360 days, and that the environmental degradation would not be noticeable even with widespread exercise of this relaxed provision.

The third commenter proposed an additional relief by extending the maximum period for which an airplane may be out of conformance from 90 to 180 days. That commenter contends that the noise impact will be very slight and most probably not be discernible to the human ear. Also, the need for temporary intermix operation does not happen very often during the life of an airplane. It usually is related to either the introductory phase of new airplanes into an existing fleet and possibly to engine upgrade programs. So according to the commenter, even a 180 day period will in fact only represent a very minor portion of the total life of an airplane.

The FAA believes that the 90 days proposed for temporary engine/nacelle intermixes is a sufficient time period. The FAA agrees with the petitioner that the paperwork and documentation requirements for the temporary design changes covered by the proposal are grossly disproportionate to the noise benefits they preserve for a short period such as 90 days or less. However, the proposed exception must be carefully prescribed to limit its impact on aircraft noise emissions to those clearly shown to be unwarranted in fulfilling the rule's purposes. Thus, the proposed exception would apply only if an engine/nacelle change accomplished on an individual airplane is temporary - that is, the airplane is brought back into conformance with an

acoustically certificated configuration for that airplane within 90 days after the initial change. Implementation is controlled through the Airplane Flight Manual and installation documentation approvals.

Present Regulation Should Remain Unchanged

One comment was received that stated that the present regulation should remain unchanged. The commenter is concerned in particular with the increase in noise levels at John F. Kennedy Airport in New York. The commenter addressed the fact that the FAA, using several airlines' data on their B-727 aircraft, estimated that the cumulative Day-Night Noise Level (Ldn) for those airplanes would usually rise an average less than 0.1 decibels at a medium size hub airport. The actual Ldn level could be higher or lower depending on the number of airplanes using intermixes at the airport during any given period. Since JFK is a large size hub airport, the commenter concludes that it can reasonably be assumed that the noise level there will rise considerably more than estimated. That commenter also stated that the more important noise measurement is the single event measure, not cumulative impact analysis.

The FAA appreciates the views expressed in this comment. The purpose of analyzing noise is to evaluate its effect on humans. To do this, numerous specialized measurement techniques and noise units have been developed over the years. For aviation noise analyses, the FAA has determined that the cumulative noise measures be used for all noise analyses. The single event measure, A-weighted sound level dB(a) in decibels is appropriate only as a supplement to cumulative impact analysis. In addition, studies have shown that the increase in aircraft noise from this action will be minimal; in some cases the noise resulting from intermix will be reduced. The overall effect will be no measurable increase in cumulative aircraft noise.

The FAA is aware that the estimated number for increased noise levels depends on the number of airplanes operating under this amendment. However, the need for temporary intermix operation does not occur very often during the life of an airplane. Thus, the definition of "acoustical changes" is being amended to apply to configurations that will be used for maintenance purposes.

Noise Suppression Equipment

One comment was received that suggested expanding design changes to include changes to noise suppression equipment, not covered by the intermix of engines and nacelles.

In order to properly respond to this comment the FAA would need a further explanation of the commenter's intent. So far, the FAA has not received any data on this subject. In addition, this issue was not presented in the NPRM and this action is limited to the scope of that Notice.

Analysis of the Amendment

This action amends Section 21.93(b) of Part 21 of the FARs (14 CFR Part 21) which contains the definition of "acoustical change" in the aircraft noise certification rules as applied to turbojet engine powered, transport category large airplanes. The following discussion outlines the changes to Section 21.93(b) of Part 21 of the Federal Aviation Regulations.

Section 21.93(b) is amended to allow the provision concerning acoustical changes to permit, under specified conditions, the intermixing of engines or nacelles changes or both, on an affected airplane. It does not affect any other applicable requirements for certification of type design or airworthiness, or for operating the affected aircraft - only those governing noise level certification. This section approves 90 day intermixes, and contemplates the reinstallation of a complying engine/nacelle combination at or before the end of the 90 days period.

Therefore, the objective of this revised paragraph is (1) to allow unlimited intermix of engines and/or nacelles for maintenance purposes up to a period of 90 days without triggering the acoustical change requirements, and (2) to thereby provide relief to operators, manufacturers, and the FAA without significant aircraft noise impact.

Adoption of the Amendment

Accordingly, Section 21.93 of Part 21 of the Federal Aviation Regulations (14 CFR 21) is amended, effective February 8, 1982.

(Secs. 313(a), 601(a), 603, and 611, Federal Aviation Act of 1958, as amended (49 U.S.C. Sections 1354(a), 1421(a), 1423 and 1431); Sec. 6(c), Department of Transportation Act (49 U.S.C. Section 1655(c)); Title I, National Environmental Policy Act of 1969 (42 U.S.C. Section 4321 et seq.), Executive Order 11514 March 5, 1970; and 14 CFR 11.45.)

NOTE: As cited above, the FAA has determined that this amendment will result in a reduction of costs to both the Government and the public. It, therefore, is not a "major rule" under Executive Order 12291 and is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). Further, it is certified that this amendment will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act as relatively few small entities will be affected and the effect on them should be minimal. A copy of the regulatory evaluation prepared for this action is contained in the regulatory docket.

A copy of it may be obtained by contacting the person identified under the caption "**FOR FURTHER INFORMATION CONTACT**."

Amendment 21-57

Market Survey Experimental Certificates for Aircraft Modifiers

Adopted: September 10, 1984 Effective: November 8, 1984

(Published in 49 FR 39650, October 9, 1984)

SUMMARY: This amendment permits aircraft modifiers who are neither aircraft nor aircraft engine manufacturers to apply for an experimental certificate to use the modified aircraft for market surveys, sales demonstrations, or customer crew training in the same manner as aircraft and aircraft engine manufacturers. In recent years type-certificated aircraft have been altered by a variety of modifications other than installation of different engines. Aircraft and aircraft engine manufacturers are eligible for experimental certificates to conduct market survey flights of their modifications. This amendment permits other aircraft modifiers to conduct such flights using an experimental certificate without obtaining an exemption for this purpose.

FOR FURTHER INFORMATION CONTACT:

Alphonse G. Santarelli, Aircraft Manufacturing Division (AWS-200), Office of Airworthiness, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; telephone (202) 426-8361.

SUPPLEMENTARY INFORMATION:

Background

This amendment, which permits aircraft modifiers who are neither aircraft nor aircraft engine manufacturers to apply for an experimental certificate to use the modified aircraft for market surveys, sales demonstrations, or customer crew training in the same manner as aircraft and aircraft engine manufacturers, is adopted for essentially the reasons outlined in Notice of Proposed Rulemaking (NPRM) No. 84-1 (49 FR 6468; February 21, 1984). That action responded to the Raisbeck-Western petition to amend Section 21.195(a) to permit aircraft modifiers to use those aircraft for market survey purposes in the same manner as aircraft manufacturers.

Section 21.195(a) of the Federal Aviation Regulations (FAR) states that a manufacturer of aircraft manufactured within the United States may apply for an experimental certificate for an aircraft that is to be used for market surveys, sales demonstrations, or customer crew training. Section 21.195(b) of the FAR states that a manufacturer of aircraft engines who has

altered a type-certificated aircraft by installing different engines, manufactured by him within the United States, may apply for an experimental certificate for that aircraft to be used for market surveys, sales demonstrations, or customer crew training if the basic aircraft, before alteration, was type certificated in the normal, acrobatic, or transport category. For the purpose of this amendment, an aircraft modifier is a person who has altered the design of an aircraft that before alteration was type certificated in the normal, acrobatic, or transport category.

In recent years, type-certificated aircraft have been altered by a variety of modifications other than installation of different engines. The above sections do not permit a "non-engine" aircraft modifier to apply for an experimental certificate to use an aircraft altered by him for market surveys, sales demonstrations, or customer crew training. A number of aircraft modifiers have been granted exemptions from either Section 21.195(a) or (b) to the extent necessary to permit those aircraft modifiers to apply for experimental certificates for aircraft to be used for market surveys, sales demonstrations, or customer crew training, subject to certain limitations.

In view of the foregoing, the Federal Aviation Administration (FAA) has determined that it is in the public interest to permit aircraft modifiers to apply for an experimental certificate to use the modified aircraft for market survey purposes.

This amendment also adds a cross-reference provision to Section 21.191(f) to more clearly show the interrelationship between this paragraph and Section 21.195. Also, the utility category is added to Section 21.195(c) since the utility category is one of the standard categories listed in Sections 21.21 and 21.183 and was inadvertently omitted previously. These are considered to be editorial changes.

Discussion of Comments

Seven commenters, representing the views of associations, individuals, and modifiers, submitted responses to NPRM 84-1. The responses are favorable.

Five commenters concur with the NPRM. One commenter, a pilot association, has no comment on the NPRM at this time. Another commenter, an airline association, advises that 14 members replied: 6 members concur with the NPRM, 6 members have no objection, and 2 members have no comment.

Regulatory Evaluation

Benefits

Adopting this rule will relieve an unnecessary regulatory constraint and would thus provide benefits to certain aircraft modifiers. It will allow them to be eligible to apply for

experimental certificates under Part 21 to test the market potential of modified aircraft before mass producing the modification kits, to demonstrate the modified aircraft to potential customers, and to conduct customer crew training.

In addition, a number of aircraft modifiers have been granted exemptions in the past to allow them to apply for experimental certificates for market survey. This rule will eliminate the need for an aircraft modifier to obtain an exemption from the requirements of Part 21 to apply for an experimental certificate to allow the modifier's aircraft to be used for market surveys, sales demonstrations, or customer crew training in the same manner as an aircraft or aircraft engine manufacturer. By obviating the need for an exemption, this rule will eliminate the minor cost required to develop and submit a petition for exemption and avoid the minor costs related to time lost while the aircraft modifier awaits the exemption. Additionally, the Federal Government (FAA) will experience minimal cost savings as the requirement to review and process petitions for exemptions submitted by aircraft modifiers to apply for experimental certificates is eliminated.

Costs

This rule will impose no new costs or requirements on aircraft modifiers, the aviation public, or the Federal Government. This rule will permit aircraft modifiers to submit applications for experimental certificates for market surveys which the FAA will process consistent with practices under section 21.195(a) and (b).

Comments Received on Notice of Proposed Rulemaking

Seven commenters, representing the views of associations, individuals and modifiers, submitted responses to the NPRM. Four commenters provided statements with regard to the economic considerations, with all endorsing the proposed rule as having a positive economic impact.

Benefit/Cost Conclusion

Based on the aforementioned discussion of the benefit and cost aspects of the rule, the benefits clearly exceed the costs.

International Trade Impact Analysis

This rule will have little or no impact on trade for both U.S. firms doing business in foreign countries and foreign firms doing business in the United States. Furthermore, no comments were received on the topic of international trade impacts.

Regulatory Flexibility Act Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure, among other things, that small entities are

not disproportionately affected by Government regulations. The RFA requires agencies to review rules which may have a "significant economic impact on a substantial number of small entities." Certain aircraft modifiers may be classified as small entities according to the RFA. However, since this proposed rule would result in minimal savings and would not impose additional cost, it will not have a significant economic impact on any of these entities.

Therefore, FAA has determined that the amendment will not, if enacted, have a significant economic impact on a substantial number of small entities.

Conclusion

This amendment provides compatibility with other paragraphs in Section 21.195 to enable a modifier of aircraft to obtain an experimental certificate for a modified aircraft in the same manner as an aircraft or engine manufacturer. Furthermore, this amendment is not likely to result in an annual effect on the economy of $100 million or more or a major increase in costs for consumers; industry; or Federal, State, or local government agencies. In addition, this amendment will have little or no impact on trade opportunities for U.S. firms doing business overseas or for foreign firms doing business in the United States. Accordingly, it has been determined that this is not a major regulation under Executive Order 12291. In addition, the FAA has determined that this action is nonsignificant under Department of Transportation Regulatory Policy and Procedures (44 FR 11034; February 26, 1979). Finally, as discussed previously in the preamble, it is certified under the criteria of the Regulatory Flexibility Act that this rule will not have a significant economic impact on a substantial number of small entities. A copy of the regulatory evaluation for this action is contained in the regulatory docket. A copy of it may be obtained by contacting the person identified under the caption "FOR FURTHER INFORMATION CONTACT."

Adoption of the Amendment

Accordingly, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended effective November 8, 1984.

(Sections 313, 314, 601, 603(c), 605, 608, 609, and 610, Federal Aviation Act of 1958, as amended (49 U.S.C. 1354, 1355, 1421, 1423(c), 1425, 1428, 1429, and 1430); 49 U.S.C. 106(g) (Revised Public Law 97-449, January 21, 1983).

Amendment 21-58

Shoulder Harnesses in Normal, Utility, and Acrobatic Category Airplanes

Adopted: November 6, 1985 **Effective: December 12, 1985**

(Published in 50 FR 46872, November 13, 1985)

SUMMARY: The amendment to Part 23 of the Federal Aviation Regulations requires the installation of shoulder harnesses at all seats of normal, utility, and acrobatic category airplanes with a passenger seating configuration, excluding pilot seats, of nine or less, manufactured one year after the effective date of the amendment. The amendment to Part 91 of the Federal Aviation Regulations requires the pilot-in-command to brief passengers on how to fasten and unfasten their shoulder harnesses for both takeoff and landing in aircraft with installed shoulder harnesses. The amendment, also, requires each occupant to use a shoulder harness, if installed, for takeoff and landing. These amendments respond to the conclusions of an FAA Crashworthiness Study Report, to a petition for rulemaking from the General Aviation Manufacturers Association and to safety recommendations from the National Transportation Safety Board. These amendments will enhance the crashworthiness of small airplanes manufactured one year after the effective date of these amendments.

FOR FURTHER INFORMATION CONTACT: J. Robert Ball, Regulations and Policy Office (ACE-110), Aircraft Certification Division, Central Region, Federal Aviation Administration, 601 East 12th Street, Kansas City, Missouri 64106; telephone (816) 374-5688.

SUPPLEMENTARY INFORMATION:

Regulatory History

These amendments are based upon a Notice of Proposed Rulemaking, Notice No. 85-11, published in the Federal Register (50 FR 19108; May 6, 1985). All comments received in response to Notice No. 85-11 were considered in adopting these amendments.

Background

Amendment 23-7 to Part 23 of the Federal Aviation Regulations (FAR), (34 FR 13078; August 13, 1969) upgraded many airworthiness standards for small airplanes. Section 23.785 was amended to require that each occupant must be protected from head injury by a safety belt and one of the following: (1) A shoulder harness to prevent the head from contacting any injurious object; (2) elimination of any injurious object within the striking radius of the head; or (3) an energy absorbing rest that would support the arms, shoulders, head, and spine.

On January 31, 1973, the FAA issued Notice No. 73-1 (38 FR 2985) proposing to amend Parts 23 and 91 of the FAR to require: (1) Shoulder harnesses for all occupants of newly certificated small airplanes; (2) shoulder harnesses for all occupants of small airplanes manufactured one year after the effective date of the amendments, regardless of the type certification basis of the

airplane; and (3) all small airplanes in service with structural shoulder harness attachment provisions, to be equipped with shoulder harnesses within one year after the effective date of the amendment.

The final action on Notice No. 73-1, was supported by the following information: (1) Approximately 80,000 to 90,000 of the 130,000 U.S. registered small airplanes in service would have been required to add shoulder harnesses on the basis of existence of structural provisions; (2) the cost per seat for the installation of a shoulder harness would have varied from $20 to $200 for most airplanes, and installations made at the factory would mainly have been in the $20 to $40 per seat range; and (3) two percent of the then current airplanes would be equipped with shoulder harnesses, 50 percent of those shoulder harnesses would be used on a regular basis, and the increased availability of shoulder harnesses would have contributed significantly to occupant protection in an airplane accident.

As the final action on Notice No. 73-1, the FAA issued Amendment 23-19 to Part 23 and Amendment 91-139 to Part 91 (42 FR 30601; June 16, 1977). Amendment 23-19 requires the installation of shoulder harnesses for the front seats of all small airplanes for which an application for a type certificate is received after July 18, 1978. Amendment 91-139 requires the installation of shoulder harnesses for the front seats of small airplanes manufactured after July 18, 1978.

Section 23.785(j) was added to require, in part, that the cabin area surrounding each seat within striking distance of the occupant's head or torso be free of potentially injurious objects and, furthermore, if energy absorbing designs are used to meet this requirement, they must protect the occupant from serious injury when the occupant experiences the ultimate inertia forces set forth in Section 23.561(b)(2).

The National Transportation Safety Board (NTSB) considered the new rules to be inadequate since the new requirements applied only to the front seats of airplanes and recommended installation of shoulder harnesses at all seats. In response to these safety recommendations, the FAA informed the NTSB that it was considering the feasibility of requiring the installation of shoulder harnesses at all seat locations and that the economic impact of the various options was being carefully assessed.

In December 1981, the FAA completed a benefit-to-cost analysis for the installation of shoulder harnesses in all general aviation airplanes. The analysis included nine alternatives for rulemaking action related to the installation and use of shoulder harnesses. The alternatives considered are cited as follows:

1. Amend Part 23 to require shoulder harnesses at all seats on newly certificated airplanes (extension of the current rule which requires shoulder harnesses at the front seats only).

Although this alternative would not have affected existing airplane designs, it would have imposed a future requirement for new airplanes regardless of whether the shoulder harness was used.

2. Amend Part 23 to require structural design provisions to accommodate the installation of shoulder harnesses at all rear seat locations on newly certificated airplanes.

This alternative would have provided the opportunity to install shoulder harnesses, at the owner's option, without the need for structural modification. This alternative would not have been applicable to airplanes being manufactured under provisions of a current type certificate.

3. Amend Part 91 to require a shoulder harness at all seat locations on new airplane models; that is, those new airplane models manufactured under an amended type certificate, within a certain time period after the effective date of the amendment. Time periods of 1, 3, and 5 years were considered for this alternative.

This alternative was similar to alternative 1, except that the scope was broadened to include airplanes manufactured under an amended type certificate and a transition period was provided.

4. Amend Part 91 to require structural provisions to accommodate shoulder harnesses at all seat locations on new airplane designs.

5. Amend Part 91 to require shoulder harnesses at all seat locations on newly manufactured airplanes after a specified date.

6. Amend Part 91 to require structural provisions to accommodate the installation of shoulder harnesses at all seat locations on all small airplanes within a specified time period.

7. Amend Part 91 to require the installation of shoulder harnesses at all seats on all small airplanes after a specified time.

All airplanes which did not have provisions for shoulder harnesses would have been required to be modified to meet the crashworthiness standards of Part 23.

8. Amend Part 91 to require structural provisions to accommodate the installation of shoulder harnesses at all seat locations on small airplanes prior to the time of reregistration.

This would have required sellers or buyers to modify the airplane before registration to the new owner.

9. Make no regulatory changes.

The FAA's Civil Aeromedical Institute (CAMI) completed a report on March 1982 entitled "Crashworthiness Studies: Cabin, Seat, Restraint, and Injury Findings in Selected General Aviation Accidents," Report No. FAA-AM-82-7. Numerous accidents were reviewed for features of crashworthiness and, in particular, for the injuries to the occupants in relation to the apparent severity of the impact and the performance of the cabin and occupant restraint systems.

In concluding the review, an estimate of the value of shoulder harnesses was made by the investigators. In the 47 accidents selected by further review, there were 136 persons involved. Eighty-seven (87) of these 136 were occupying a pilot or copilot seat, and it was estimated that 42 of the 49 occupants in rear seats would have had less severe injuries had shoulder harnesses been available and used. From this study, it is clear that shoulder harnesses enhance the crashworthiness of an airplane and reduce the possibility of serious or fatal injuries to occupants of other seats, in addition to those occupying the front seats.

A review of the 1981 Benefit-Cost Analysis and the CAMI Report indicated a varying positive benefit-to-cost ratio for alternatives 1, 2, and 7. Because alternative 7 is of such complexity and cost, and because some of the data upon which the 1981 study was based has changed, the FAA is conducting further study of this alternative before deciding if regulatory action is needed. Some of the factors which lead to the conclusion that further study was necessary are as follows:

1. The 1981 benefit-to-cost estimates the overall costs to be from $287 million to $328 million and more recent information indicates even higher costs.

2. The cost of shoulder harness installation can vary appreciably from one airplane to another. For example, the owner of an airplane manufactured without the attachment point for shoulder harnesses or whose airplane requires structural strengthening would have to bear significantly greater expense than an owner whose airplane only requires the installation of shoulder harnesses.

3. Rather than retrofit all seats, it may be more appropriate to retrofit only those seats where it can be done at reasonable cost or to retrofit only the front seats because these seats have a much higher occupancy rate than the rear seats and, correspondingly, the benefit-to-cost ratio will be significantly higher.

The FAA requested information from the public relating to the practicality of requiring the retrofitting of existing small airplanes with shoulder harnesses at all seats in Notice No. 85-11. In response to the request information, the FAA received little information either to support or to reject further rulemaking action on the retrofit issue.

Alternatives 1 and 2 were rejected because alternative 5, based upon new information and proposed in Notice No. 85-11, would provide much greater benefits than those in alternatives 1 and 2. In preparing the benefit-to-cost analysis for alternative 5 of the 1981 analysis, "Amend Part 91 to require the installation of shoulder harnesses at all seat locations on newly manufactured airplanes after a specified date," it was assumed that the cost would include the design, installation of provisions for shoulder harnesses, and the shoulder harness. Further, the actual installation cost of shoulder harnesses at each seat is now estimated at $150 to $250 per seat, because the attaching means for these shoulder harnesses will be provided in the affected airplane. Prior to developing Notice No. 85-11, the FAA was informed by the General Aviation Manufacturers Association, that after December 31, 1984, their newly manufactured small normal, utility, and acrobatic airplanes with a passenger seating configuration, excluding pilot seats, of nine or less, would have structural provisions incorporated and the member companies would be voluntarily installing shoulder harnesses where practical.

The GAMA manufacturers, which produce the majority of small airplanes, indicate that, except for airplanes purchased by Part 135 operators, they will, where practical, voluntarily provide structural provisions and install shoulder harnesses at all seat locations in these small airplanes. Accordingly, a review of the benefit-to-cost analysis has shown that alternative 5 would now have positive benefits relative to the estimated costs. Consequently, the FAA concluded that the objective of alternative 5 would be more economically viable than alternatives 1 or 2. The substance of alternative 5 was proposed in Notice No. 85-11. For those small airplane manufacturers, which are not members of GAMA, the one year compliance period requiring the installation of shoulder harnesses at all seat positions on newly manufactured small airplanes was considered a reasonable length of time.

Discussion of Comments

In response to Notice No. 85-11, the FAA received comments from 19 interested persons. Most comments express agreement with the proposal.

One commenter states that, while favoring the proposal, amending Section 23.785 addresses but one part of an overall absence of meaningful crashworthiness criteria within Part 23 of the FAR. This commenter contends the proposal is more form than substance until such time as the ultimate inertia forces set forth in Section 23.561 are increased. The FAA does not agree with these remarks. Numerous studies by the FAA, NTSB, and others indicate that a significant improvement is made in small airplane crashworthiness by the installation and use of shoulder harnesses. While the Small Airplane Airworthiness Review Program (48 FR 4290, January 31, 1983), addresses the commenter's proposed increase in the ultimate static inertia forces of

Section 23.561(b)(2), a more appropriate course of action is to consider a dynamic testing requirement for seats and restraint systems simulating the survivable crash event and establishing criteria for occupant protection.

Two commenters contend that Technical Standard Order (TSO)-C22f, Safety belts, must be amended. One commenter states that TSO-C22f should be amended to require that the minimum standards for safety belt and shoulder harness systems be sufficient to restrain people equivalent to the 95th percentile man under foreseeable and survivable crash forces in a dynamic crash environment with due consideration for the geometry of each particular installation. The commenter also states, that a 500 percent increase in the specified values to which restraint systems are presently required to be designed and manufactured under a TSO would have minimum economic impact. The second commenter provides detailed changes to be considered in amending TSO-C22f. The FAA has a program to consider dynamic testing of seats within Part 23 of the FAR and shoulder harnesses in this respect are considered a part of the airplane seats. In addition, the FAA has a program to amend TSO-C22f.

One commenter notes that the language used by the National Highway Traffic Safety Administration (NHTSA) and the FAA is substantially different in the area of passenger restraint systems. The commenter suggests that conformity of the FAA rulemaking to terminology now used throughout the passenger restraint industry (i.e., pelvic restraint; upper torso restraint) would impact favorably on the introduction of occupant restraint systems currently existing into the aviation industry in a form more closely aligned with the state-of-the-art. The FAA is aware of the differences in terminology between NHTSA regulations and those proposed by the FAA with regard to occupant restraint systems. The FAA considered the use of the term "upper torso restraint" instead of the term "shoulder harness" in the proposal. Since many of the Federal Aviation Regulations use the term "shoulder harness" and the aviation community readily identifies with this terminology, the term "shoulder harness" is retained in these amendments.

One commenter suggests that the safety benefits of the proposed rule would be significantly enhanced by requiring that manufacturers make available, within one year following the effective date of the amendment, shoulder harness kits suitable to retrofit previously produced airplanes of types in current production with "upper torso restraint systems" capable of satisfying the amended rule. The commenter further recommends that a subsequent date should then be established (e.g., two years thereafter) upon which installation of such modification kits by all owners would become mandatory. However, another commenter recommends that the installation of shoulder harnesses on existing airplanes remain on a voluntary basis. This issue is one of the subjects of a current FAA study to determine the economic viability of alternative 7. Shoulder harness retrofit kits for all seats are presently available from the manufacturers

of nearly all small airplanes. Upon completion of the FAA study, a decision will be made on whether to proceed with further

rulemaking.

One commenter requests that the proposal be revised to provide for the installation of aft-facing or club seating arrangements in airplanes with a seating capacity of six or more without installing shoulder harnesses for aft-facing seats since the seat back must be designed to withstand the inertia forces prescribed in Section 23.561(b)(2) to comply with Section 23.785(j) of the FAR. The FAA disagrees. A shoulder harness on an aft-facing seat will provide lateral restraint in many airplane accidents where motion is not parallel to the longitudinal axis of the airplane and also provides rebound protection.

One commenter states that although no specific mention of side-facing seats is made in the regulations, it would appear that installation of shoulder harnesses on these type seats might enhance injuries when occupants are subjected to the inertia forces of Section 23.561(b)(2), and, therefore, there should be other means of protecting occupants of side-facing seats. This commenter suggests a requirement similar to Section 23.785(e), which is applicable to berths. The FAA recognizes that providing an equivalent level of safety on side-facing or club seats may present the designer a more difficult task than forward- or aft-facing seats. Furthermore, the commenter did not provide any information or data on how a level of safety could be provided that would be equivalent to that which would accrue from the installation of shoulder harnesses on forward- and aft-facing seats.

The FAA does not have adequate data to define safety provisions for side-facing seats or club seating equivalent to that afforded in a forward- or aft-facing seat with a shoulder harness and does not consider the berth requirements to be adequate for seats. This rulemaking action defines the occupant restraint requirement for forward- and aft-facing seats and, if an applicant chooses to provide different seating arrangements, that applicant must provide adequate data to substantiate that those seating arrangements provide an equivalent level of safety. The FAA is clarifying the requirements being adopted in Section 23.785(g) by stating that for seat orientations other than forward- and aft-facing, the seat and restraint means must be designed to provide a level of occupant protection equivalent to that provided for forward- and aft-facing seats with safety belts and shoulder harnesses installed in normal, utility, and acrobatic category airplanes. Also, in light of the proposal to adopt a commuter category airplane within Part 23 as set forth in Notice No. 83-17 (48 FR 52010, November 15, 1983), the FAA plans to retain the standards in effect on the date of issuance of Notice No. 83-17 respecting seat and shoulder harness

requirements for commuter category airplanes.

One commenter expresses a hope that, concurrent with the installation of shoulder harnesses at every seat, the manufacturers will make a serious attempt to improve the function and comfort of occupant restraint belts. This commenter contends that many shoulder harness designs are not well matched to the range of human body forms and are extremely uncomfortable, even during short term use. In addition, this commenter states many current designs do not easily allow scanning of the airspace by pilots for potential traffic since the shoulder harness is unnecessarily restrictive and does not allow significant upper torso movement. Another commenter, in opposing the proposal, recommended that the FAA expend an effort in getting a proper aviation restraining device for the pilot and copilot's seats of existing airplanes. The FAA recognizes that improvements could be made over currently installed shoulder harnesses and is, therefore, requiring compliance with the requirements of Section 23.785(h) for the flightcrew member seats of all newly manufactured airplanes by adoption of new Sections 23.2 and 91.33(b)(14).

One commenter states that the current 40 percent usage rate of shoulder harnesses needs to be improved. This commenter recommends that Section 91.14(a)(3) be amended to require each occupant to use that available shoulder harness for takeoff and landing. The FAA agrees since the mere availability of shoulder harnesses does not achieve the purpose of having harnesses installed. Therefore, the FAA amends Section 91.14(a)(3) as suggested by this commenter in order to achieve the level of safety intended by this rulemaking action. This commenter contends that a further improvement to safety could be made if each occupant were required, while en route, to keep the safety belt properly secured about his/her person while seated. The FAA agrees that this is a prudent practice but does not agree that the Federal Aviation Regulations should be amended to make this practice mandatory. Passengers can clearly visualize the need for properly secured restraint devices during takeoffs and landing, but cannot visualize such a need in routine nonturbulent flight. Requiring restraint devices to be secured without a clear and identifiable need would tend to dilute the effectiveness of the requirement of Section 91.14(a)(3), as adopted by this rulemaking.

The previous commenter states that, at the present time, because shoulder harnesses are optional, seats and safety belts in combination or by themselves must accommodate the loads prescribed in Section 23.561. Additionally, the commenter contends that since the shoulder harness can transfer large loads directly to the fuselage, the shoulder harness could possibly carry a large portion of the precribed 9g load in a particular seat/safety belt/shoulder harness system. When the shoulder harness is made mandatory, this commenter states, designers will be in a position to reduce the strength of the seat/safety belt combination and meet the standard on the basis that the combined

seat/safety belt/shoulder harness system accommo**DATES** the prescribed load. This commenter contends that the seat/safety belt combination, of itself, should continue to be required to withstand the precribed load of 9g, as should the shoulder harness, and the entire seat/safety belt/shoulder harness system. The FAA agrees that there should not be a lowering of the strength requirements for safety belts regardless of their combination with shoulder harnesses. This amendment does not revise the safety belt strength requirements of Section 23.1413, but adds the shoulder harness requirements to the airworthiness standards of Section 23.785(g). In response to this comment, the FAA requires each safety belt and shoulder harness to comply with Section 23.1413, which must meet the load prescribed in Section 23.561(b)(2).

Two commenters oppose the proposal with regard to the installation of shoulder harnesses in newly manufactured airplanes to be operated in air commerce for compensation or hire, and in scheduled passenger operations pursuant to Part 135 of the FAR. One of these commenters contends that the FAA ignored that part of its petition for rulemaking which stipulated that the shoulder harness installation should not be applicable to airplanes operated in air commerce for compensation or hire under Part 135 with a passenger seating configuration, excluding pilot seats, of nine or less. In response to this comment, the FAA did not ignore that part of the petition which stipulated that shoulder harnesses should not be applicable to airplanes operated pursuant to Part 135. The FAA evaluated the merits of this aspect and concluded that, irrespective of the type of operation, all newly manufactured normal, utility, and acrobatic category airplanes with a passenger seating capacity, excluding pilot seats, of nine or less should have shoulder harnesses installed at all seat positions. Arguments presented by the commenters do not persuade the FAA that the proposal should be changed. In support of Notice No. 85-11, the FAA's report entitled, "Crashworthiness Studies: Cabin, Seat, Restraint, and Injury Findings in Selected General Aviation Accidents", which is cited in the background paragraph of this amendment, concluded that shoulder harnesses enhance the crashworthiness of an airplane, and, thus, reduce the possibility of serious or fatal injuries to occupants of other seats, in addition to those seats occupied by the pilot and copilot or other front seat passenger. The second of these commenters states that the United States regional and commuter airlines currently operate 721 airplanes of nine or less passenger seats in scheduled Part 135 passenger service, of which 219 are single-engine airplanes. In addition, this commenter states that four basic types account for 64 percent of all airplanes of this size: the Cessna 206/207 series, the Cessna 402/404 series, the Piper PA-31 piston engine derivatives, and the Britten-Norman Islander series. The commenter states that these airplanes are equipped by the manufacturers with "airline interior options" and are completed different from the normal interior options purchased by personal and business use customers. It is contended that because the commuter airlines presently operate a substantial number of

airplanes of the affected size (as well as large airplanes) not equipped with shoulder harnesses, these operators do not want to introduce shoulder harnesses to their fleets. It is alleged that this reluctance is not due to a lack of awareness of safety, but rather stems from concern over the confusion and perceptions that will ensue among passengers boarding some commuter airplanes equipped with shoulder harnesses and some without shoulder harnesses. This commenter cites the safety records from the 1984 NTSB statistics as 1.14 accidents per 100,000 flight hours for scheduled Part 135 operations, 4.24 accidents per 100,000 flight hours for on demand air taxi Part 135 operations, and 9.82 accidents per 100,000 flight hours for general aviation operations. The FAA recognizes, as this second commenter states, that the safety record of Part 135 scheduled passenger operations has been substantially better than the safety record for other types of operation with airplanes having nine or less passenger seats. In addition, this commenter contends that airplanes of the same type have a greater utilization rate in both number of flights and number of passengers carried in scheduled Part 135 operations than does the same type of airplane used in personal or business use; however, the high rate of use in Part 135 operations relative to the same airplane models in general aviation use exposes a substantially larger number of people to the unlikely event of an accident. Therefore, the installation of shoulder harnesses at all seats provide an enhanced level of safety to a larger number of people for these airplanes when used in Part 135 operations. Relative to possible passenger confusion and perceptions among passengers relative to some airplanes having shoulder harnesses and some not having shoulder harnesses, the commenter did not state the nature of the anticipated confusion and perceptions and the FAA does not visualize any effect on the resulting level of safety - only the passengers might ask questions concerning the installation of the shoulder harnesses on new airplanes used in Part 135 operations. This same commenter also contends that the additional maintenance and passenger briefing effort would pose a very large burden on the Part 135 operators. This commenter presents neither information nor data to support this contention. The FAA does not agree that the installation of shoulder harnesses would impose any significant additional maintenance or briefing effort on Part 135 operators as maintenance and briefing efforts are presently required with respect to the safety belts in the affected airplanes.

One commenter contends that the implementation of the proposal is a gesture in futility disguised as safety and the only results will be more litigation directed at pilots and owners alleging neglect to properly brief passengers. This commenter states that there is no possible way of enforcing the requirements and will be pressed to get passengers to do that which they do not have to do on a commercial carrier. The FAA does not agree. This commenter presented no information to support the contention of more litigation or that passengers will not use shoulder harnesses for takeoffs and landings when available. In addition, Section 13.1 of the FAR addresses the

issue of reporting to the FAA any known violation of any regulation or order issued pursuant to the Federal Aviation Act of 1958, as amended, and Section 91.3 places the responsibility for operation of an airplane upon the pilot.

Another commenter states that the installation of shoulder harnesses in new airplanes is an unnecessary expense and the only thing that the proposal will do is raise the price of airplanes. The FAA does not agree that the installation of shoulder harnesses in new airplanes in an unnecessary expense because of the number of fatalities and serious injuries that will be prevented. With regard to raising the price of airplanes, those manufacturers which are GAMA members are presently installing on a voluntary basis shoulder harnesses at all seat positions and, therefore, no additional expense is being incurred that is not currently present in the price of new airplanes from these firms.

Sections 21.17 and 21.101 are amended to reference new Section 23.2. These amendments are considered nonsubstantive, but are necessary to ensure that Section 23.785, which is being made mandatorily retroactive, will be complied with and incorporated in the type certificate, amended type certificate, or supplemental type certificate, as appropriate. New Section 23.2 could affect pending applications for type certificates at the time Section 23.2 becomes effective. Also, compliance with Section 23.2 for newly manufactured airplanes which were previously type certificated would require an amended type certificate or a supplemental type certificate. Accordingly, reference to new Section 23.2 is needed in Sections 21.17 and 21.101.

The FAA is deleting the phrase "with a passenger seating configuration, excluding pilot seats, of nine or less" at the end of Section 23.785(g), as stated in the notice. This phrase is redundant because of the general applicability of Part 23 with respect to the normal, utility, and acrobatic categories of airplanes, as set forth in Section 23.1. New applications for a type certificate pursuant to Part 23 for normal, utility, and acrobatic category airplanes, is limited to airplanes with a passenger seating configuration, excluding pilot seats, of nine or less.

Economic Impact

The economic impact information provided below was prepared from the Final Regulatory Analysis.

It is estimated that the cost of a shoulder harness is about $150 to $250 per unit. The relatively high cost in relation to automobile seat belts is because of the low production volume and the requirement to carefully install the shoulder harness to make certain it is properly aligned. The life of a shoulder harness is estimated to be 10 years, depending on use, the timing of seat replacement, and the effects of sunlight on the belting material.

The benefit of a shoulder harness is the reduction in casualty loss attributable to the shoulder harness, that is, the number of lives and injuries saved by those using the shoulder harnesses who would have been killed or injured if they had not used the shoulder harness.

There were 480,000 passenger seats in the active general aviation fleet in 1981. There was an average of 607 passenger fatalities per year for the period 1979 through 1981. Therefore, the average fatality rate over the entire general aviation fleet was 126 per 100,000 seats.

The NTSB has conducted an analysis of 1982 accidents in which the utility of shoulder harnesses was evaluated. In these accidents, 40 percent of the occupants were wearing shoulder harnesses when available, and this was the estimate used for the calculation of benefits in the NPRM. Since this amendment revises the NPRM's proposal to now require each occupant to use the available shoulder harness for takeoff and landing, and because there has been an active education program by the general aviation community and the FAA to promote the use of shoulder harnesses, the FAA now estimates that shoulder harness use will increase to 60 to 80 percent. For the purpose of this analysis, 70 percent will be the estimated usage rate.

NTSB estimated that about 20 percent of the people killed could have survived if they had been wearing shoulder harnesses. Therefore, shoulder harnesses are likely to save about 17.6 people per 100,000 seats per year (70% of 20% x 126 fatalities per 100,000 seats). The FAA in 1984 valued a life at $670,000. Thus, over a 10 year period, the life of a shoulder harness, there would be a reduction in fatalities valued at $118 million for 100,000 seats. The cost of equipping these seats with shoulder harnesses is $20 million ($200 per seat x 100,000 seats). Since lives will be saved uniformly over the ten year period and the shoulder harness investment will be made in the first year, the benefit to cost ratio is about 3.5 taking into consideration the time value of money (the FAA uses 10%).

There was only one comment relating to the cost and benefits. One commenter indicates that Part 135 scheduled passenger operations is nine times safer overall than general aviation flying and, therefore, there was not as great a need for shoulder harnesses for this aviation segment. This comment was addressed in a previous section.

Additional detail relating to the economic impact can be found in the Regulatory Evaluation which has been placed in the docket.

Trade Impact

This rule would have little or no impact on trade for both U.S. firms doing business in foreign countries and foreign firms doing business in the U.S.

In the U.S., foreign manufacturers would have to meet U.S. requirements, and, thus, they would gain no competitive advantage. In foreign countries, U.S. manufacturers can be competitive by either installing or not installing shoulder harnesses depending on requirements. There were no comments relating to trade impact.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires agencies to review rules which may have a significant economic impact on a substantial number of small entities.

The FAA's criteria for a small manufacturer is one with less than 75 employees, a substantial number is one which is not less than 11 and which is more than one-third of the small entities subject to the proposed rule, and a significant impact is one having an annual cost of more than $13,700 in 1984 dollars per manufacturer.

A review of the aircraft manufacturers indicates that there are less than eleven "small" manufacturers. In addition, members of the General Aviation Manufacturers Association (GAMA) are voluntarily installing shoulder harnesses and, therefore, this amendment will not impact these manufacturers whether large or small.

There were no comments relating to the initial regulatory flexibility determination.

Conclusion

The FAA has determined that this document involves regulations which are not considered to be major under the procedures and criteria prescribed by Executive Order 12291. However, this document is considered to be significant under Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A copy of the regulatory evaluation prepared for this action is contained in the regulatory docket. A copy may be obtained from the person identified as the contact for further information. Furthermore, the FAA certifies that this regulation will not have a significant economic impact on a substantial number of small entities under criteria of the Regulatory Flexibility Act since few, if any, small entities are involved. In addition, this final rule will have little or no impact on trade opportunities for U.S. firms doing business overseas or for foreign firms doing business in the United States.

In consideration of the foregoing, the Federal Aviation Administration amends Parts 21, 23 and 91 of the Federal Aviation Regulations (14 CFR Parts 21, 23, and 91) effective December 12,

1985.

AUTHORITY: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 1857f-10, 4321 et. seq.; E.O. 11514; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-59
Airworthiness Standards and Operating Rules: Commuter Category Airplanes

Adopted: January 8, 1987 **Effective: February 17, 1987**

(Published in 52 FR 1806, January 15, 1987)

SUMMARY: These amendments to Parts 21, 23, 36, 91, and 135 of the Federal Aviation Regulations (FAR) adopt certification procedures, airworthiness and noise standards, and operating rules for an additional category of propeller-driven, multiengine airplane, designated as the Commuter Category. The amendment to Part 21 allows certification of commuter category airplanes by the same procedures applicable to other aircraft. The amendment to Part 23 adds airworthiness standards for airplanes with a maximum seating capacity, excluding pilot seats, of 19 or less, a maximum certificated takeoff weight of 19,000 pounds or less, and requires type certification compliance with the International Civil Aviation Organization (ICAO) Annex 8, Part III, requirements which apply to airplanes weighing in excess of 5,700 kilograms (12,566 pounds). The amendment to Part 36 adopts noise standards applicable to small, propeller-driven airplanes to be certificated in the commuter category. Parts 91 and 135 are amended to prescribe rules governing the operation of commuter category airplanes as required by the general operating and flight rules.

Since 1966, the FAA has been applying various additional airworthiness requirements to the certification of small airplanes, intended for use in air taxi operations, to achieve an acceptable level of safety when the affected airplanes are so utilized. These additional requirements were set forth in special conditions, Special Federal Aviation Regulation (SFAR) No. 23, Part 135, Appendix A, SFAR 41. The SFARs were temporary rules intended only to provide relief to the industry and public from the lack of suitable certification procedures and standards while the FAA developed permanent rules. SFAR 23 ceased to be applicable after July 19, 1970, and SFAR 41 expired on September 13, 1983. This final rule, which adds the new commuter category, will set forth airworthiness requirements in Part 23 for airplanes intended for use in commercial operations. As a result of this action, airplanes certificated in the commuter category will achieve a level of safety requisite for commercial operations.

This document also requests comments on new seat and weight demarcations between small and large airplanes.

DATES: The effective date of these amendments is February 17, 1987. The closing date for comments is March 16, 1987.

ADDRESS: Comments on the proposed new demarcation lines are to be marked "Docket No. 23516" and mailed in duplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attn: Rules Docket (Docket No. 23516), 800 Independence Avenue, S.W., Washington, D.C. 20591; or deliver comments in duplicate to: Room 916, 800 Independence Avenue, S.W., Washington, D.C. Comments may be inspected at Room 916 on weekdays, except Federal holidays, between 8:30 a.m. and 5 p.m.

FOR FURTHER INFORMATION CONTACT: J. Robert Ball, Regulations and Policy Office (ACE-110), Aircraft Certification Division, Central Region, Federal Aviation Administration, 601 East 12th Street, Kansas City, Missouri 64106: Telephone (816) 374-5688.

SUPPLEMENTARY INFORMATION:

Regulation History

These amendments are based upon a Notice of Proposed Rulemaking, Notice No. 83-17, published in the Federal Register on November 15, 1983 (48 FR 52010). All comments received in response to Notice No. 83-17 were considered in adopting these amendments.

Background

Since 1953, the airworthiness standards have distinguished small from large airplanes by a 12,500 pound maximum certificated takeoff weight (MCTW) limitation regardless of the type of operation. When this weight limitation was established, little concern was expressed that this demarcation would eventually become questionable with regard to airworthiness standards for an airplane of the commuter category. At that time, there were few airplane designs near this 12,500 pound limitation; i.e., they were either considerably above or below that weight.

In 1966, the FAA established an air taxi airworthiness program with the objective to provide a transition for air taxi airplanes from the small airplane requirements of Part 23 to the transport category airplane requirements of Part 25. That program resulted in the issuance of Special Federal Aviation Regulation No. 23 (34 FR 189; January 7, 1969). An additional step in the upgrading of airworthiness standards for reciprocating-engine and turbopropeller-powered small airplanes used in Part 135 operations was the adoption of an Appendix A to Part 135 (35 FR 10098; June 19, 1970) which set forth additional airworthiness standards for airplanes with ten or more passenger seats.

On July 7, 1970, the FAA issued Notice No. 70-25 (35 FR

10911) proposing to upgrade the level of airworthiness of small airplanes intended for operations under Part 135. In response to the comments received to Notice No. 70-25, and after further consideration, the FAA determined to limit the future applicability of Part 23 to small normal, utility, and acrobatic category airplanes with a seating configuration, excluding pilot seats, of nine or less. At that time this action was considered more appropriate than adding additional airworthiness requirements to Part 23. This action was based upon a trend toward an increase in the number and types of airplanes designed to carry relatively large numbers of passengers. At that time, the FAA considered that continued applicability of Part 23 to small airplanes designed to carry ten or more passengers was no longer in the interest of safety and future generations of these small airplanes should adhere to the level of safety afforded by the requirements of Part 25, irrespective of whether operations were conducted under Part 135 or Part 91. Thus, Amendment 23-10 limiting the number of seats, excluding pilot seats, to nine or less became effective March 13, 1971, and is applicable to normal, utility, and acrobatic category airplanes for which an application for a type certificate is received by the FAA after the March 13, 1971, date.

On August 29, 1977, the FAA issued Notice No. 77-17, (42 FR 43490) Part 135 Regulatory Review Program, proposing, in part, to prohibit the operation, after certain **DATES**, of reciprocating engine or turbopropeller-powered small airplanes not certificated in the transport category and having a passenger seating configuration of ten or more seats. Before the closing date for comments on November 28, 1977, the FAA withdrew this part of the proposal in Notice No. 77-17. The more significant reasons given for the withdrawal are (1) comments on this proposal showed its effect would virtually destroy the commuter airline industry and deprive the general public of needed transportation; (2) the proposal had already disastrously effected the industry; (3) airplane sales had been cancelled and operators had serious difficulty with financing; and (4) the cost of complying with the proposal would exceed 300 million dollars for an industry whose total profits did not exceed 50 million dollars a year.

Consequently, the FAA determined that the proposal should not be retained as part of the proposed new Part 135. The FAA did note that the withdrawal of the proposal did not preclude the FAA from issuing similar proposals in the future due to a change in circumstances nor commit the FAA to any course of action. The FAA encouraged further comments on this issue.

The FAA/Industry Commuter Aircraft Weight Committee submitted a petition to amend the regulations to allow certain small airplanes to be type certificated at maximum certificated takeoff weights greater than the 12,500 pound limitation without complying with the transport category airworthiness requirements of Part 25. Responding to this petition and other needs for improved standards resulting from the Airline Deregulation Act, the FAA initiated a three-phase program for certification and

operation of commuter airplanes. The first phase was the issuance of a revised Part 135 - Air Taxi Operators and Commercial Operators (43 FR 46 FR 46742; October 10, 1978), which aligned the rules for those operations more closely with those of Part 121 - Certification and Operations: Domestic, Flag, and Supplemental Air Carriers and Commercial Operators of Large Aircraft. The second phase, initiated by Notice No. 78-14 (43 FR 46734; October 10, 1978), proposed temporary rules stating the additional airworthiness requirements necessary to provide for increased takeoff gross weight and passenger seating capacity of certain existing small, propeller-driven, multiengine airplanes. The outcome of this Notice was the adoption of SFAR No. 41 (44 FR 53723; September 17, 1979), which became October 17, 1979. The third phase established the Light Transport Airworthiness Review, Notice No. 78-17 (43 FR 60846; December 28, 1978) to develop a separate set of airworthiness standards for multiengine airplanes with a maximum gross weight up to 35,000 pounds and a seating capacity up to 30 passengers. Subsequent considerations and recommendations from industry during the Review escalated the maximum weight and passenger capacity limits to 50,000 pounds and 60 passengers for the light transport category airplane. Nevertheless, the FAA terminated the Light Transport Airworthiness Review Program because, based on available information, the expected economic benefits resulting from a new light transport airplane airworthiness regulation would not be realized.

After the expiration of SFAR No. 41, as amended, on October 17, 1981, and termination of the Light Transport Airplane Airworthiness Review, the FAA reinstated SFAR No. 41, with amendments, as SFAR No. 41C, effective September 13, 1982 (47 FR 35150; August 12, 1982), for 1 year and subsequently started development of the commuter category requirements. Accordingly, Notice No. 83-17 (48 FR 52010; November 15, 1983) contained the proposed commuter category requirements.

This rulemaking package was initiated prior to the issuance on October 9, 1986, of NTSB Safety Recommendations A-86-98 through A-86-118, which deal with commuter airplane operating requirements. The FAA has not yet completed its review of those recommendations or developed its position on them. This rulemaking has no relationship with those recommendations and they have not been addressed in this document. If, after further review, the FAA finds it necessary to undertake additional rulemaking, we will do so.

Discussion of Comments

General

Interested persons were invited to participate in the development of this final rule by submitting such written data, views, or arguments as they may desire to the regulatory docket on or before February 14, 1984. In response to Notice No. 83-17, the FAA received 29 sets of comments.

In general, the comments received address five major issues: (1) past FAA actions relative to airworthiness standards for airplanes of a size similar to those proposed in Notice No. 83-17; (2) the level of safety provided by the commuter category airplane airworthiness standards; (3) required compliance with the minimum standards of the International Civil Aviation Organization (ICAO); (4) different levels of safety for similar 19-passenger airplanes with maximum certificated takeoff weights below 12,500 pounds and above 12,500 pounds; and (5) comments which address specific proposals, or the lack of proposals, given by section number of Part 23.

Two commenters cite past FAA actions as being inconsistent with the proposal of airworthiness standards in Part 23 for type certification of an airplane in the proposed commuter category. One of these commenters oppose the proposal and cites the adoption of Amendment 23-10, effective March 13, 1971, which restricted future Part 23 airplanes to nine seats or less, excluding pilot seats. This commenter notes that, at that time, the FAA considered future airplanes capable of carrying more than nine passengers should be type certificated to Part 25. The other commenter quotes various statements from the notices of the Light Transport Airworthiness Review program and the purpose stated for the proposed Part 24 - Airworthiness Standards: Light Transport Airplanes, and questions the FAA action in issuing Notice No. 83-17.

In response to the comment addressing the adoption of Amendment 23-10, the various rulemaking activities subsequent to the adoption of that amendment evidence significant changes in circumstances. Lack of adequate standards resulted in an unworkable situation by requiring all future airplanes capable of carrying more than nine passengers to be type certificated to Part 25. The problems created by that requirement are evidenced by the Light Transport Airworthiness Review Program in which Part 24 was proposed and by the adoption of SFAR No. 41 and its subsequent amendments as interim measures. Amendment 23-10 does, however, continue to be applicable to type certification of normal, utility, and acrobatic category airplanes.

The Light Transport Airworthiness Review Program recognized that application of Part 25 airworthiness standards to a light transport airplane was inappropriate. As noted in Notice No. 78-17 (43 FR 60846, December 28, 1978), which initiated the Review, the FAA proposal for a Part 24 tried to establish a balance between the transport category requirements in Part 25 and the small airplane requirements in Part 23 which would maintain the level of safety believed appropriate for light transport airplanes carrying passengers for hire. The airworthiness standards of Part 24 were initially proposed for an airplane with a maximum seating capacity of about 30 passengers and a maximum weight of 35,000 pounds without regard to the type of powerplants. Upon termination of the Review, the parameters defining the light transport airplane extended to airplanes

capable of carrying a maximum of 60 passengers and having a maximum weight of 50,000 pounds.

Based on the cited rulemaking efforts, the FAA does not consider the adoption of the new commuter category and the airworthiness standards for this category of airplane in Part 23 to be inconsistent with past actions by the FAA.

Information available to the FAA resulted in a determination, and industry has concurred, that a need exists for permanent airworthiness standards for an airplane of the size stated in Notice No. 83-17 and that an additional category of airplane should be established within Part 23. The FAA's alternatives were to relax the requirements of Part 25 to accommodate the new category or to propose additional airworthiness standards in Part 23 for the new category. The most appropriate course for the FAA was to propose the integration of additional standards into Part 23. The FAA considers the current airworthiness standards applicable to new type certification applications for normal, utility, and acrobatic category airplanes of Part 23, and the additional airworthiness standards of SFAR No. 41, as supplemented by those airworthiness standards necessary to comply with the minimum requirements developed by the International Civil Aviation Organization (ICAO) in Annex 8, Part III. The ICAO standards apply to airplanes weighing 5,700 kg. (12,566 lbs.) or more and to the carriage of passengers in international air navigation. The airworthiness standards of Appendix A of Part 135 not previously adopted in Part 23, which apply to airplanes with ten or more passenger seats, were also proposed for type certification of commuter category airplanes. The satisfactory service experience of propeller-driven, multiengine normal category airplanes recertificated to the additional requirements of SFAR No. 41 was drawn upon to support this course of action.

Several comments were received addressing the level of safety of the proposed commuter category airplane. As stated in the Notice, the level of safety established by the proposed airworthiness standards for the new commuter category are considered, to the maximum feasible extent, equivalent to those provided by the airworthiness standards for larger airplanes used in air transportation. In this determination, the FAA considered the following: (1) the airworthiness standards of Part 23, including all current amendments, would apply as a type certification basis for the commuter category; (2) the commuter category is limited to propeller-driven, multiengine airplanes and a maximum seating, excluding pilot seats, of 19 passengers; (3) the airworthiness standards for all commuter category airplanes up to and including the maximum certificated takeoff weight of 19,000 pounds must comply with those standards established by ICAO for airplanes weighing 5,700 kg or more; (4) the compartment interior requirements are equivalent to those set forth in Part 25 at the time Notice No. 83-17 was issued, irrespective of maximum weight of the commuter category airplane; and (5) engine fire detector and fire extinguishing systems are

required for type certification of any commuter category airplane. The FAA will continue to review the airworthiness standards for commuter category airplanes and propose improvements and up**DATES**, when necessary, to maintain the level of safety intended for airplanes to be used by commuter airlines and when shown to be in the public interest.

The FAA received numerous comments supporting the proposal. However, eight of the commenters use the phrase "special commuter category." The Federal Aviation Regulations and predecessor regulations have for many years addressed airworthiness standards for four categories of airplanes; i.e., normal, utility, acrobatic, and transport. This discussion does not include the restricted and limited categories which have specific applicability. The FAA assumes that the commenters are misinterpreting the word "special" if they are using it as a carryover from the temporary Special Federal Aviation Regulation No. 41 which contained the additional airworthiness standards for recertification of certain small airplanes with increases in maximum weight or passenger seats or both. The commuter category is not "special." It is a new category of airplane being established by this rulemaking.

Two commenters oppose mandatory compliance with the ICAO Annex 8, Part III requirements on the basis that, to date, the performance requirements have been supplied to SFAR No. 41 certificated airplanes only when it was necessary to meet the international requirements of ICAO Annex 8. They assert that compliance with the ICAO requirements should be optional. One commenter contends that the ICAO rules generally represent the essential elements of Part 25 performance requirements and the inclusion of overly stringent and economically burdensome requirements are not essential to ensure the safety of modern airplanes to which the new commuter category airworthiness standards will apply. Furthermore, one commenter requests that the proposal be revised to restore the current SFAR No. 41 performance requirements; i.e., to permit Part 135 Appendix A performance for commuter category airplanes. In support of the commenter's position, the commenter submits plots showing the number of airports in the United States that could not be served due to the performance limitations of two currently certificated SFAR No. 41 airplanes.

On the other hand, several commenters, including an airline association, a foreign airplane manufacturer, and foreign civil airworthiness authorities support the proposal that the commuter category airplane comply with the ICAO Annex 8, Part III, requirements. One commenter contends that the performance of commuter airplanes has, in past years, been marginal in cases of engine failure and that the proposal to add ICAO Annex 8, Part III to commuter standards, bringing the commuter airplanes into conformity with international standards, will provide an additional protection and, therefore, endorses the proposal.

Two commenters contend that the provisions of section 1(a)

of SFAR No. 41 should be incorporated into the proposed commuter category requirements in Part 23. This would allow type certification of airplanes in the commuter category with ten or more passenger seats (up to 19 seats) and a maximum weight of 12,500 pounds or less by compliance with regulations incorporated in the type certificate and only the additional requirements in Appendix A, of Part 135. This would also result in a dichotomy of the airworthiness standards for commuter category airplanes weighing up to 12,500 pounds and those weighing above 12,500 pounds.

The main argument presented by these commenters is that omission of section 1(a) of SFAR No. 41 from the proposed commuter category rule is inconsistent with the International Civil Aviation Organization (ICAO) standards of Annex 8. The ICAO standards differentiate the airworthiness requirements for airplanes weighing up to 12,500 pounds and those weighing more. Airplanes weighing more than 12,500 pounds must comply with Annex 8, Part III, while those weighing less than 12,500 pounds may comply with lesser requirements.

The FAA does not agree that the current requirements in SFAR No. 41 provide adequate or appropriate requirements for type certification of newly designed airplanes in the new commuter category. The Federal Aviation Act of 1958, as amended, addresses the level of safety in air transportation provided by air carriers in at least two specific sections. First, Section 601(b) states, in part, "... the Secretary of Transportation shall give full consideration to the duty resting upon air carriers to perform their services with the highest possible degree of safety in the public interest and to any differences between air transportation and other air commerce." Secondly, section 419(c) states,in part, "... the Administrator, by regulation, shall establish safety standards (A) for aircraft being used by commuter air carrier ... Such safety standards ... shall impose requirements upon such commuter air carriers to assure that the level of safety provided to persons traveling on such commuter air carriers is, to the maximum feasible extent, equivalent to the level of safety provided to persons traveling on air carriers which provide service pursuant to certificates issued under Section 401 of this title."

The ICAO airworthiness standards proposed for the commuter category airplane are the minimum standards to ensure safety of airplanes over-flying another contracting state. Contracting states, such as the United States, may establish standards which provide a higher level of safety than the ICAO minimum standards. The passenger capacity and proposed commercial service use are more meaningful parameters to delineate airworthiness safety standards than is airplane weight. Associating airworthiness standards with the number of passengers carried is also consistent with the nine passenger seat limitation requirement currently applicable to normal, utility, and acrobatic category airplanes. The proposed airworthiness standards are the minimum required in the interest of safety and form an integral part of

the level of safety achieved by air carriers. Therefore, no changes in the proposal are made.

Several commenters contend that the production limitation date of October 17, 1991, for SFAR No. 41 airplanes should be eliminated and production of currently certificated SFAR No. 41 airplanes should be permitted for an indefinite period of time.

In response to these comments, we note that SFAR No. 41 was promulgated to meet an immediate need for the emerging commuter airline industry. That SFAR was predicated on the application of additional airworthiness standards for existing type certificated normal category airplanes that had demonstrated a good safety record. At the time SFAR No. 41 and its subsequent amendments were adopted, they provided airworthiness standards which met the mandate of the Congress regarding the safety standards for airplanes used by commuter air carriers. The temporary airworthiness standards of SFAR No. 41 served the purpose for which they were intended and established the necessary level of safety mandated by Congress. In any case, newly manufactured airplanes which are certificated under SFAR No. 41 will not be required to comply with these requirements.

One commenter states that Part 23, as amended, by this final rule should provide for airplanes with ten or more passenger seats and a maximum certificated takeoff weight of 12,500 pounds or less, citing paragraph 1(a) of SFAR No. 41 as the reason for such a provision. Additionally, several commenters contend that certification of airplanes in the commuter category should be permitted by complying only with the additional requirements applicable to the commuter category and those requirements stated in the previous type certification basis of their airplane.

The FAA does not agree that the commuter category should differentiate between airplanes that weigh less than 12,500 pounds and those that weigh more than 12,500 pounds. Furthermore, the FAA has concluded that a certification basis for the new commuter category should include all current amendments of Part 23 plus all of the airworthiness standards of SFAR No. 41 in order to achieve the appropriate level of safety. The proposed requirements for fuel tanks, fire extinguishing systems, fire extinguishing agents, compartment interiors, fuel system components crashworthiness, and landing gears are essential to the level of safety expected of airplanes to be type certificated in the new commuter category, irrespective of the weight of the airplane. Certification of airplanes to only the SFAR No. 41, paragraph 1(a) requirements would permit certification of airplanes with a seating configuration, excluding pilot seats, of 19 or less without complying with the above requirements.

The traveling public is entitled to the protection afforded by these safety requirements regardless of whether the commuter category airplane has a maximum certificated takeoff weight above or below 12,500 pounds. In addition, the FAA has had several airworthiness review programs of the airworthiness standards for

Part 23 airplanes. The purpose of these airworthiness reviews has been to improve and update the airworthiness and crashworthiness standards applicable to the type certification of new small airplane designs and many of the airworthiness standards required by paragraph 1(a) of SFAR No. 41 have subsequently been adopted into Part 23 for new designs of airplanes in the normal, utility, and acrobatic categories. These requirements alone are not considered adequate for commuter category airplanes and must be supplemented as set forth in Notice No. 83-17 for commuter category type certification.

The FAA received comments in support of the proposal which contend that the proposal is equivalent to the airworthiness standards of the proposed Part 24 for the light transport airplane. The FAA does not agree that the airworthiness standards for the commuter category airplane are equivalent to those of the recently proposed Part 24. Some of the reasons for this disagreement are the unrestricted use of powerplants, the size, and maximum weight of the proposed Part 24 airplane and airworthiness standards directly related to airplanes of this size.

Six additional commenters in support of the proposal, operators of SFAR-41 airplanes, stated that redesign of the 19-seat commuter airplane to meet the requirements of Part 25 would be cost prohibitive. The information supplied by these commenters is consistent with that provided by commenter to a proposal in Notice No. 77-17 which would have required all airplanes operated under Part 135 after June 30, 1984 to meet Part 25 requirements. That proposal in Notice No. 77-17, comments received on it, and FAA reason for withdrawal of the proposal, is discussed earlier in the Regulatory History portion of this final rule. Based on the comments which resulted in the withdrawal of Notice No. 77-17 and these six comments, the FAA does not plan to propose that existing 19-seat commuter airplanes be redesigned to meet the requirements of Part 25.

One commenter suggests changes to Part 1 to redefine "small aircraft." No justification or reason to support a redefinition of "small aircraft" is offered. The suggested redefinition, therefore, is unnecessary.

Discussion of Comments to Specific Sections of Parts 21, 23, 36, 91, and 135

The following comments and discussions are keyed to like-numbered proposals contained in the Notice, or to specific sections where the comments address sections not previously addressed in Notice No. 83-17. In Notice No. 83-17, proposals numbered 1 through 59 address Part 23; proposals 60 through 72 address Part 21, proposals 73 through 78 address Part 36, proposal 79 addresses Part 91, and proposals 80, 81, and 82 address Part 135.

Proposal 1 -- No comments were received in response to the

proposed title change to Part 23. The title of Part 23 is adopted as proposed.

Proposal 2 -- No specific comments were received in response to the proposed amendment of Section 23.1; however, general comments related to Section 23.1 have been discussed under the previous general comments of this preamble. Section 23.1 is adopted as proposed.

Proposal 3 -- One commenter contends Section 23.3(d) should be revised to provide for airplanes limited to 12,500 pounds maximum takeoff weight and a seating configuration, excluding pilot seats, of ten or more. The FAA does not agree. The airworthiness standards, adopted herein establish requirements for the commuter category, regardless of weight, from less than 12,500 pounds up to and including 19,000 pounds, or passenger seating configuration, excluding pilot seats, not to exceed 19.

One commenter recommends that Section 23.3 be amended to require all airplanes used by scheduled air carriers to be certificated as commuter category since, under the present and proposed rules, airplanes of nine or fewer passenger seats will continue to be eligible for certification under existing Part 23 rules and not the enhanced commuter category rules. The FAA recognizes the merit of the comment and will consider additional rulemaking to enhance the level of safety of airplanes used by scheduled air carriers with a passenger configuration of nine or less when shown to be in the public interest or necessary for safety. The FAA considers this comment to be outside the scope of this rulemaking activity and one that cannot be adopted concurrently with these amendments without additional public participation in such a proposal.

Another commenter recommends that Section 23.3(d) be changed to add single-engine, turbopropeller-powered airplanes to the commuter category. The FAA does not agree with the inclusion of single-engine, turbopropeller-powered airplanes within the commuter category. While the commenter contends that turbopropeller engines have a record of increased reliability over reciprocating engines, the prospect of a single-engine failure does not provide the level of safety expected from the airworthiness standards for commuter category airplanes which must have the ability for continued safe flight and landing after probable failures, including the failure of an engine.

One commenter questions the rationale and justification which restrict the commuter category to propeller-driven airplanes. The commenter contends that this restriction does not appear to enhance the airworthiness of the commuter category and could unduly restrict innovative designs. The scope of the proposal was limited to integrating into Part 23 the airworthiness standards as set forth in Notice No. 83-17, including those necessary to comply with the ICAO requirements. Since the airworthiness standards proposed in Notice No. 83-17 would apply to propeller-driven airplanes only, these standards

are not considered adequate for other propulsion system designs. The comment is not germane to the scope of this final rule.

A minor clarifying change was made to proposed Section 23.3(e) by inserting the word "type" before the word "certificated." This makes clear that certification in that paragraph was with reference to type certification and not to airworthiness certification.

It has been past FAA policy to issue an airworthiness certificate for an airplane in more than one category. However, for an airplane type certificated in both the normal and commuter categories, the FAA will not issue an airworthiness certificate for more than one category. This procedure is being established because of significant differences among the airworthiness, maintenance, and operating requirements applicable to normal and commuter category airplanes. Accordingly, for those airplanes that may be type certificated in both the normal category and the commuter category, an applicant may apply for a standard airworthiness certificate as either a normal or commuter category airplane, but not for multiple airworthiness certification in both categories. If the applicant selects airworthiness certification as a normal category airplane, the airplane must be operated as a small airplane with a seating configuration, excluding pilot seats, of nine or less in accordance with the normal category type certificate limitations for the airplane. Alternatively, if the applicant selects airworthiness certification as a commuter category airplane, the airplane must be operated in accordance with the commuter category type certificate limitations for the airplane.

Proposal 4 -- One commenter states that paragraph 4(a) of SFAR No. 41, as amended, requires the establishment of a maximum zero fuel weight and contends that Section 23.25 should include such a requirement. The FAA agrees. Therefore, establishment of a maximum zero fuel weight by the applicant, as required in paragraph 4(a) of SFAR No. 41, is considered necessary and Section 23.25 is revised accordingly to assure the airplane design considers the necessary operational limitations with variations between payload and fuel loads.

Proposal 5 -- One commenter states, for ICAO Annex 8 compliance, that an approach configuration must be selected. The FAA agrees that the applicant should determine the approach configuration since compliance with the airworthiness standards for commuter category airplanes requires performance in the approach configuration. Accordingly, Section 23.45(f)(1) is changed by adding the word "approach" following the words "en route" in the requirements for airplane configuration selection by the applicant.

Another commenter recommends a statement of principle as a new paragraph (a) to be added to Section 23.45 to read as follows, and subsequent paragraphs renumbered accordingly:

"(a) The intended level of safety will be achieved only if the performance information, established and furnished in accordance with FAR 23, Subparts B and G, is used in conjunction with the performance operating rules of FAR 135.399 through FAR 135.403."

The commenter proposes revisions to Section 135.399 and additional sections to Part 135. The FAA does not agree that a "statement of principle" should be included in Section 23.45. The Federal Aviation Act of 1958, as amended, sets forth the requisite policy and principle with respect to airworthiness standards and operating rules for U.S. civil aircraft.

The previous commenter also recommends that Section 23.45(f)(3) include reference to the "takeoff flight path" unless it is covered by "...the critical-engine-inoperative takeoff performance," and the landing distance. The FAA agrees with the recommendation and, for clarity, this general performance requirement has been revised to include "takeoff flight path" and "landing distance" in Section 23.5(f)(3). Since Section 23.1583, Operating limitations, requires this information to be included in the Airplane Flight Manual (AFM) for safe operation and since Section 23.75 includes requirements for determining landing distances, Section 23.45(f)(3) should include requirements that make it clear that the applicant must establish these procedures.

In addition, the commenter recommends that Section 23.45(f)(4) be revised to include the establishment of procedures for conducting a missed approach and the requirement for these procedures be stated in the Airplane Flight Manual in accordance with the requirements of Sections 23.1585 and 23.1587. The FAA agrees with the recommendation. Since new Sections 23.67(e)(3) and 23.77(c) contain requirements for the establishment of condition for the execution of a missed approach and balked landing and Section 23.45(f)(4) as proposed in Notice No. 83-17 requires the establishment of procedures for the execution of balked landings, the procedures for executing a missing approach should also be included in this amendment of Section 23.45(f)(4). These procedures are required to be in the Airplane Flight Manual by Section 23.1585(a). The FAA considers this addition as an elaborative, nonsubstantive, nonsubstantive change to Section 23.45(f)(4).

One commenter contends that Sections 23.45 through 23.77 should reflect the standards contained in Sections 25.101 through 25.125 for the following reasons: (1) the proposed wording of Section 23.55, Accelerate-stop distance, does not incorporate (V sub EF) or the time delays for engine failure recognition and reaction by the pilot as required by Part 25, and (2) proposed Section 23.57, Takeoff path, would require a 2.0 percent steady state climb gradient. This is an improvement over existing regulations, but the commenter is of the opinion that 2.4 percent should be required, contending this gradient is very important to the level of safety attained. The commenter contends that the level of safety is not the result of tailoring each takeoff for

the most critical condition, but of establishing a floor such as the 2.4 percent gradient. A floor gradient covers those anomalies not accounted for by the takeoff equation; e.g., actual runway gradient rather than average, runway outside air temperature, windshear, drag from brakes and other contaminants, engine power degradation, instrument errors, and weight and balance errors. In addition, this commenter states that if the takeoff is predicated upon clearing obstacles by some fixed value; e.g., 35 feet, the end result will be disastrous because these anomalies may contribute to a failure to clear the obstacle.

The FAA does not agree with the comment that Sections 23.45 through 23.77 should be replaced with the requirements of Sections 25.101 through 25.125. The requirements of Sections 23.45 through 23.77 which require a 2-percent second-segment climb gradient are the standards for airplanes recertificated to SFAR No. 41 as supplemented by those requirements necessary to comply with the flight performance standards of ICAO Annex 8, Part III. Those recertificated airplanes have a good safety record and retaining those requirements as well as adopting the enhanced flight performance requirements of ICAO Annex 8, Part III, provide the safety level expected of the new airplane designs permitted by this new category. Furthermore, this final rule includes many of the Part 25 requirements suggested by this commenter.

Another commenter states that the proposed flight requirements for this category of airplane attain the appropriate level of safety of commuter category airplanes. The commenter states that the additional requirements of SFAR No. 41C, which brought airplanes over 12,500 pounds into compliance with ICAO Annex 8, Part III, now appear to be applicable to any 10-to 19-seat airplane, even if under 12,500 pounds. The commenter supports this action.

In response to this comment, to clarify what appears to be a misconception on the part of the commenter, the additional requirements of SFAR No. 41C did not require airplanes of over 12,500 pounds to comply with the requirements of ICAO Annex 8, Part III. The ICAO Annex 8 requirements are applicable only if an applicant desires to comply with them for certification to SFAR 41C; i.e., compliance is not mandatory as implied by the commenter. The commenter correctly understands that the ICAO Annex 8 requirements are applicable to any commuter category airplane, even if under 12,500 pounds. Accordingly, ICAO Annex 8 requirements, as adopted by this amendment, are applicable to any commuter category airplane, even if the seating configuration, excluding pilot seats, is less than ten or the airplane has a maximum weight of less than 12,500 pounds and is to be type certificated in the commuter category.

Proposal 6 -- The comments received in response to the proposed amendment of Section 23.51, were discussed under Proposal 5. Accordingly, Section 23.51, is adopted as proposed.

Proposal 7 -- One commenter agrees with the FAA decision to apply essentially Part 25 standards to takeoff performance criteria for commuter category airplanes. This commenter suggests that a significant simplification of Section 23.53, Takeoff speeds, could be achieved if it were based more closely on the existing requirements of Section 25.107 and the Joint Airworthiness Requirements (JAR) 25.107. A proposed simplification was offered. (NOTE: The Civil Airworthiness Authorities of certain European countries have agreed common to comprehensive and detailed airworthiness requirements referred to as the Joint Airworthiness Requirements (JAR) with a view to minimizing type certification problems on joint ventures, and also to facilitate the export and import of aviation products.) The FAA agrees and Section 23.53(c) has been simplified by deletion of subparagraph (c)(4)(ii) and (iii) which are included in subparagraph (c)(1) of this section.

Another commenter notes the absence of a requirement for the determination of the minimum unstick speed, V sub MU, and the resultant absence of V sub MU consideration in the determination of the rotation speed, V sub R. A determination of V sub MU was not a requirement for a type certification under SFAR No. 41 and the FAA considers the requirement that V sub R not be less than 1.10 V sub S1 or 1.10 V sub MC as an adequate safeguard. In addition, another commenter supports this FAA position and notes that the V sub R requirement is more stringent than that required for transport category airplanes. In addition, the determination of V sub MU typically requires addition of equipment to the airplane to conduct the tests and the FAA considers the additional tests as unnecessary for commuter category type certification.

Proposal 8 -- One commenter states that although the proposed requirement of Section 23.55, Accelerate-stop distance, have been accurately adopted from Part 135, Appendix A, Section 5(c), this section has always conflicted with the definition of V sub 1 as a decision speed. The commenter suggests that Section 23.55(a)(2) be changed to read "... at which V sub 1 is reached assuming that, in the case of engine failure, the pilot decides to stop at the speed V sub 1." Another commenter contends that the proposal needs to be modified since it is not entirely consistent with the relationship between V sub 1 and V sub EF, as stated in Section 23.53(c)(1)(iv). This commenter suggests that the language used in Section 23.55(a) emulate the existing requirements of Section 25.109(a) and JAR 25.109(a). The FAA agrees with the first commenter regarding the conflict with the definition of V sub 1 as a decision speed and also with V sub 1 and V sub EF as proposed in Section 23.53(c)(1)(iv). These apparent conflicts can be resolved by more clearly setting forth the series of events necessary to determine the accelerate-stop distance requirement. Section 23.55(a) is revised accordingly and the revision is a nonsubstantive change to the requirement as proposed.

One commenter suggests Section 23.55(b)(3) be changed to read "... no more than average skill is required..." instead of "... exceptional skill is not required..." The commenter does not provide a reason for the suggestion. Section 25.109(b)(3) has the same wording as the proposal in Section 23.55(b)(3) and the FAA is not aware of any interpretive problems with the Part 25 requirement. Accordingly, Section 23.55(b)(3) is adopted as proposed in Notice No. 83-17.

Proposal 9 -- Two commenters note that Section 23.57 is patterned after the requirements of Section 25.111, and that Section 23.57(c)(2) includes the "second segment" climb requirement. They contend that this approach to stating the requirements may ultimately cause disputes; therefore, it is more appropriate to include the requirement in Section 23.67, Climb: one engine inoperative. The FAA agrees and the words "at a steady gradient of not less than two percent, and" are deleted as proposed in Section 23.57(c)(2) and the "first segment" and "second segment" climb requirements are added to Section 23.67 as recommended by these commenters.

One commenter contends the takeoff path should terminate at 1,000 feet above the takeoff surface as stated in Part 135, Appendix A, instead of 1,500 feet as proposed in Section 23.57(a) and the final rule should delete all en route climb gradient requirements other than a 1.2 percent standard. The FAA does not agree. First, airplanes recertificated to SFAR Nos. 41B and 41C which comply, at the election of the applicant, with the ICAO requirements, the ICAO 1,500-foot takeoff path requirement applies instead to a 1,000-foot takeoff flight path required in Part 135, Appendix A. Furthermore, commuter category airplanes are to comply with the ICAO requirements. Secondly, en route climb gradient requirements other than 1.2 percent were required by an SFAR 41 amendment which set forth the requirements for ICAO compliance. These requirements are necessary in the commuter category standards to comply with the ICAO airworthiness standards.

Another commenter contends the 2-percent climb gradient to 400 feet, as stated in Part 135, Appendix A, paragraph 6(b)(2), has been interpreted to be the same gradient required at airfield altitude. This commenter cites Section 25.121(b) which was not referenced in SFAR No. 41B to satisfy compliance with ICAO requirements. The commenter states the same criteria currently contained in Part 135, Appendix A, should be retained for Section 23.57(c)(2) and further contends that no reason is evident for changing that regulation. The FAA does not agree. The proposed climb gradient adopted in Section 23.67 more clearly identifies the requirement for climb with one engine inoperative. The climb gradient is necessary to comply with the ICAO requirements and the level of safety expected on new airplane designs of the commuter category.

Another commenter contends that applications for type certification in the commuter category, for airplanes with more

than two engines, are likely to be rare and some simplification of Section 23.57 and other requirements might be achieved by the deletion of requirements relating to three- and four-engine airplanes. The FAA concludes, however, that in cases where an applicant is designing a three- or four-engine airplane, the applicant should know the applicable requirements for its design. Therefore, the requirements for three- and four-engine airplanes should remain in the final rule. Accordingly, the proposal regarding three- and four-engine airplanes is adopted as proposed.

One commenter understands that FAA policy, with respect to transport category airplanes, is to deny performance credit for manual propeller feathering before the airplane reaches a height of 400 feet above the takeoff surface and suggests that Section 23.57(c)(4) be changed to include the commenter's understanding of this policy as a clarification of the use of propeller feathering in determining commuter category airplane performance. The commenter's understanding is correct. Furthermore, the FAA used Part 135, Appendix A, paragraph 6(b), Takeoff climb: one-engine-inoperative, as one of the reference sources for the Section 23.57(c)(4) proposal. Paragraph 6(b) states, in part, "... the remaining engines at the maximum takeoff power or thrust, and the propeller of the inoperative engine windmilling with the propeller controls in the normal position, except that if an approved automatic feathering system is installed, the propellers may be in the feathered position: ..." To clarify the condition for which use of propeller feathering can be regarded as a configuration change, the word "automatic" will precede the word "propeller" in the final revision of Section 23.57(c)(4). This action is not based upon the policy applied to transport category airplanes, but rather upon the requirement stated in the additional airworthiness standards of Part 135, Appendix A, which was to be integrated into Part 23 for commuter category airplanes as indicated in Notice No. 83-17.

Proposal 10 -- One commenter states that this new Section 23.59 should be applicable for ICAO Annex 8 compliance and should apply only when the applicant elects such compliance. The FAA disagrees. The issue of ICAO Annex 8 compliance has been discussed previously as it concerns the level of safety expected of new airplane designs for the commuter category.

Another commenter supports the proposal but, nonetheless, suggests a change based upon material contained in Advisory Circular, Joint (ACJ) No. 25.113(a)(2) for takeoff with all engines operating. (NOTE: AJC advisory material is developed in conjunction with the JAR airworthiness standards.) The commenter contends that requirements of takeoff and accelerate-stop performance data are incomplete unless they include sufficient information to allow the rational downward adjustment of V sub 1 when taking off from a wet runway. The FAA does not agree. The requirements, as stated, are essentially equal to those applied to transport category airplanes as cited in Section 25.113(a). The FAA is not aware of any significant problems in applying the

requirements of that section nor of any unsafe conditions arising from application of its requirements either to transport category airplanes or to the SFAR No. 41 airplanes which comply with the ICAO requirements.

One commenter, while stating that Section 23.59(b) is a desirable addition, contends a new speed, V sub LOF, is introduced. In addition, the commenter suggests the V sub R should be substituted for V sub LOF since this would result in a more conservative, shorter takeoff run. The FAA does not agree that a new speed, V sub LOF, has been introduced. Section 23.51(b) currently states, "For multiengine airplanes, the lift-off speed, V sub LOF, may not be less than V sub MC determined in accordance with Section 23.149." In addition, the FAA does not agree that V sub R should be substituted for V sub LOF because V sub R is the rotation speed for takeoff and V sub LOF is the speed at which the airplane leaves the takeoff surface after attaining the rotation speed, V sub R.

Another commenter contends that few airport authorities declare clearways and that few operators have the resources to carry out independent surveys. Operators should be permitted to use defined clearways when available and permitted by the operating rules. Takeoff distance limitations would result in a unwarranted penalty at airports where clearways have been defined by the responsible authorities. Accordingly, the FAA is adopting the requirements as proposed.

Proposal 11 -- One commenter states that the new Section 23.61, only applies to ICAO Annex 8 compliance and should apply only when the applicant elects such compliance. The FAA disagrees. The issue of complying with the requirements of ICAO Annex 8 has been previously discussed.

Another commenter recommends deleting the requirements applicable to three- or four-engine airplanes. The FAA disagrees. See the discussion in Proposal 9.

Proposal 12 -- One commenter contends that the proposed change to Section 23.65 concerns all-engine climb and, except for balked landing climb, Part 135, Appendix A, is not concerned with all engine climb. Accordingly, the commenter recommends the deletion of proposed paragraph (d) to Section 23.65. This commenter contends that the source referenced for the proposal is in error. Another commenter contends that the proposed additional paragraph (d) is superfluous because: (1) a requirement to furnish performance data in the Airplane Flight Manual is contained in Section 23.1587, Performance information; (2) proposed new paragraph (a) to Section 23.45, General, requires all performance requirements to be met at ambient atmospheric conditions; and (3) the existing Section 23.21(a) requires all flight requirements to be met "at each appropriate combination of weight and center of gravity...for which certification is requested." The FAA has reexamined the proposal, considered the comments made, and does not agree with

the commenters' contentions. The requirement states that the performance data must be determined. The information requirement of Section 23.1587 cannot be furnished until it is determined as required by Section 23.65(d).

Proposal 13 -- One commenter states that proposed Section 23.67(e) requires unwarranted reliance on the takeoff path requirements of proposed Section 23.57 for one-engine-inoperative climb requirements. This commenter contends that the proposed regulation can be interpreted as meaning either that the takeoff with the landing gear extended requirement of Part 135, Appendix A, paragraph 6(b)(1) has either disappeared or may be demonstrated in ground effect and that neither case is considered satisfactory. This commenter recommends Section 23.67(e) should be rewritten in a manner that follows the pattern of Part 135, Appendix A, paragraph 6(b) in order to be more easily understood.

Additionally, another commenter states that the proposed Section 23.67(e)(2) seems to be redundant with proposed section 23.57(c)(3)(i) for two-engine airplanes and less restrictive than proposed Section 23.57(c)(3)(iii) for three- and four-engine airplanes; therefore, proposed Section 23.67(e)(2) might be deleted.

One further commenter states that no reason has been offered for failing to include the takeoff climb, landing gear extended, requirement of Part 135, Appendix A, in this rule and contends that Section 25.121(a) and JAR 25.121(a) have always had such a requirement. This commenter asserts that Section 23.57(c)(1) is not an adequate substitute because the takeoff climb with the landing gear extended should form a part of the takeoff weight, altitude, temperature (WAT) limitation and the "second segment" climb should also be included in Section 23.67 instead of Section 23.57. This commenter also states that, as discussed in the comment to Section 23.57, the "second segment" takeoff climb with the landing gear retracted should also be located in Section 23.67 since this, too, forms a part of the takeoff WAT limitation. In addition, this commenter states that by referencing Section 25.1533(a)(1), it is clear by analogy with Section 25.121(c), that proposed Section 23.67(e)(2) forms the third component of the takeoff WAT limitation. This commenter submitted a rewrite of Section 23.67(e) for consideration.

The FAA thoroughly considered the comments received along with the requirements of proposed Section 23.67(e). The FAA agrees that the requirements should be rewritten to be more easily understood. The removal of the requirements for one-engine-inoperative climb in the takeoff from proposed Section 23.57 and the insertion of that requirement in Section 23.67 will meet this objective.

One commenter contends that a need exists for a further requirement similar to Section 25.1533(a)(1) and JAR 25.1533(a)(1), which calls for a performance operating limitation to be established; i.e., the maximum takeoff weight as a function

of altitude and temperature, at which compliance can be shown with the minimum climb gradient of proposed Section 23.67(e). The FAA considers that the further requirement is encompassed adequately within the proposed requirements of Section 23.1583(c)(3)(iii). This commenter contends that accepting a lower standard for the "second segment" climb is difficult to defend and also asks why there is no increase in values for three- and four-engine airplanes. The FAA considers the "second segment," 2-percent climb gradient for two-engine airplanes as the minimum standard based upon the satisfactory service experience with two-engine airplanes recertificated to SFAR No. 41. The FAA, however, reviewed this comment and agrees that a minimum standard should be established for three- and four-engine airplanes. Accordingly, in order to clarify this section and make it consistent with other proposed sections in this rulemaking action, Section 23.67(e)(1)(ii) must include appropriate climb gradients for three- and four-engine airplanes. Also, corrections have been made to Sections 23.67(e)(1)(i) and 23.67(e)(2) by including appropriate three- and four-engine provisions.

One commenter contends that a need exists for a knowledge of the airplane's net climb/descent gradient with one engine inoperative in order to establish compliance with the performance operating rules relating to en route flight proposed by the commenter. The commenter asserts that this need is not met by existing Section 23.67 and a proposed wording for a new section is offered. The FAA does not agree. The proposed requirements meet the en route performance operating rules of Part 135. Accordingly, the proposed section from this commenter has not been adopted.

Comments which are subsequently discussed on Proposal 15 notes that the proposed requirements for approach landing climb were misplaced under Section 23.77. As discussed under that proposal, the approach landing climb requirements proposed for Section 23.77 have been relocated to Section 23.67(e)(3).

Proposal 14 -- One commenter contends that the requirements of Section 23.75, even as amended by proposed new paragraph (g), are inadequate in that they fail to address landing with one engine inoperative. As in the case of evaluation of takeoff performance, a clearer presentation of the relevant requirements can be achieved if the speeds and distances are considered in separate sections. As suggested text for a new requirement of reference approach speeds in offered. This commenter proposes that the landing field length requirement proposed by that, inasmuch as it includes consideration of the all-engines-operating and the one-engine-inoperative cases, is more complex than that proposed in Notice No. 83-17. The commenter notes that higher ambient temperatures dictate greater landing distances and the effect is amplified if credit for reverse thrust is allowed in accordance with existing Section 23.75(f). The FAA does not agree that the proposed requirements are inadequate or that there is a need to separate the landing

speeds and determination of landing distances into separate sections. The requirements, as proposed, are essentially the same as those applied to transport category airplanes for Part 25 type certification. The comment addressing ambient temperature as one parameter against which landing distances should be determined is well taken. However, Section 23.1583, Operating limitations, as proposed, requires as a limitation, the maximum landing weight for each altitude, ambient temperature, and required landing runway length within the range selected by the applicant. Section 23.75 is designed for test purposes and the affect of ambient temperature on the landing distance is calculated in accordance with Section 23.1583. Therefore, no change is being made to the proposed requirement.

One commenter contends that consideration of wind in Section 23.75(g)(1) is superfluous and should be deleted because of wind consideration in Section 23.75(g)(3). Wind condition analysis is set forth in Section 23.75(g)(3), as proposed. The requirement that wind conditions must be considered is set forth in Section 23.75(g)(1). These paragraphs perform different functions, therefore, the word "wind" in Section 23.75(g)(1) is not considered superfluous. Section 23.75(g)(1) is adopted as proposed.

Proposal 15 -- One commenter states that in order to maintain the Part 25 and JAR 25 format, the balked landing climb requirements, for all categories of airplane should be transferred to Section 23.65, Climb: All engines operating. The FAA does not agree. This commenter contends that the balked landing climb gradient minimum for commuter category airplanes should not be greater than the 3.2 percent climb gradient required for transport category airplanes. No supporting information was given concerning the inappropriateness of the balked landing climb gradient and that portion of the proposal is, therefore, adopted as proposed.

The comment is made that the minimum speed of 1.10 V sub S1 is considered grossly inadequate since it implies an unacceptable erosion of stall speed margin and/or a need for a significant acceleration if the flaps are retracted from the landing position early in the maneuver. The contention, however, is that a climb initiated at precisely the landing approach speed has the characteristic of being slightly conservative, since climb performance is likely to improve slightly should the speed fall below V sub REF (reference speed) in an operational maneuver. This commenter offers a rewrite of the proposal. The FAA does not agree that the 1.10 V sub S1 speed is inadequate as the minimum for this balked landing climb speed. Similar requirements have been applied to airplanes certificated under SFAR No. 41, and these airplanes have safely operated under the current rules.

One commenter contends that the proposal has two problems: (1) the proposal addresses the approach climb and is misplaced under Section 23.77. Balked landing, which has a very exact

meaning; and (2) the requirement should apply only to ICAO Annex 8 compliance and should be deleted or made optional. The commenter states that the approach climb requirement applies with the landing gear retracted and flaps in the approach position and the proposal should be clear that the landing gear is in the retracted position. Another commenter notes this and also suggests that Section 23.67 Climb: one engine inoperative, includes the requirement for approach landing climb instead of the section concerned with the balked landing requirements. The FAA agrees that the approach-landing climb more appropriately should be cited as a one-engine-inoperative climb requirement and is being placed in Section 23.67(e)(3) for those requirements. As indicated previously, the FAA does not agree that the approach landing climb requirement should be deleted or optional. Accordingly, the requirement for approach landing climb is placed in amended Section 23.67 instead of Section 23.77 in substantially the same form as proposed in Notice No. 83-17.

Another commenter states that proposed Section 23.77(c)(2), although adopted substantially unchanged from Section 25.121(d) and JAR 25, is an unsatisfactory requirement primarily due to the operationally unrealistic speed at which the climb gradient minimum may be met. The commenter proposes an existing ICAO Airworthiness Technical Manual standard which possibly avoids this and other purported shortcomings of Section 25.121(d) and JAR 25.121(d). The contention is that the proposal has the merit of ensuring compatibility, down to decision heights of 200 feet, with the ICAO PANS/OPS 1:40 go-around obstacle profile and offers greater flexibility in terms of configuration changes. Therefore, the proposal is not necessarily any more stringent than Section 25.121(d) or JAR 25.121(d). While the proposal of the commenter appears to have merit, it introduces several requirements which need further consideration. The requirements of Section 23.77(c)(2) as proposed in Notice No. 83-17 have been applied in numerous type certification programs and no adverse experience with such application has been offered. Accordingly, the proposed requirements of Section 23.77(c)(2) are adopted in section 23.67, Climb: one engine inoperative, as recommended by the commenters.

Two comments were received on the issue of minimum control speed on the ground. V sub MCG. One commenter questions the lack of a requirement to determine V sub MCG. Another commenter states that to provide an adequate constraint on the lowest value of V sub EF with which V sub 1 may be associated, the inclusion in Section 23.149 of a definition of the minimum control speed on the ground is necessary. A text based upon Section 25.149(e) was proposed by this commenter. The FAA recognizes the merit in the suggestion; however, based upon experience with recertification of airplanes to the requirements of SFAR No. 41, a requirement for determining the minimum control speed on the ground, V sub MCG, is not necessary at this time.

One commenter contends an adequate definition of the reference landing approach speed with one engine inoperative

depends on the definition of the minimum control speed during landing approach with one engine inoperative, V sub MCL-1. The contention is the minimum control speed with one engine inoperative is needed to maintain adequate lateral and directional control in the event of a one-engine-inoperative approach being discontinued. A text based upon JAR 25.149(g) is offered by this commenter. The FAA does not agree because the requirements of Section 23.67 which relate to approach landing climb must be met for type certification. The FAA is not aware of any adverse experience because of the lack of such a determination, nor was any data submitted to support the contention. Furthermore, such a requirement has not been required for recertification of airplanes to SFAR No. 41.

One commenter states that the required rates of roll of Section 23.157, at takeoff and during the approach, which result from the application of the formula contained in paragraphs (a) and (c) are not disputed. With the increase from 12,500 pounds to 19,000 pounds for the maximum takeoff weight of commuter category, however, these formulas yield rates of roll somewhat lower than designers would wish to achieve or pilots perceive as adequate and are lower than what is considered acceptable in ACJ 25.147(c)(2) and ACJ 25.147(e) for transport category airplanes. This commenter contends that this problem can readily be resolved by a proposed language change to Section 23.157(a) and (c). The FAA does not agree that Section 23.157 should be revised. The requirements of Section 23.157 are the minimum rates of roll and designers may increase the rates of roll for their airplanes if they choose. Therefore, Section 23.157 is an adequate minimum standard for commuter category airplanes and no change is being made to the existing requirement.

Proposal 16 -- One commenter contends that the proposal appears to provide a lower standard for commuter category airplanes that is applied to normal category airplanes and that the current requirements of Section 23.161(c)(2) appear adequate. Another commenter states that since most commuter category airplane operations would be conducted under instrument flight rules (IFR), reducing control forces to zero (trimmed flight) under most flight conditions is important. This commenter contends that requiring the airplane to be in trim, laterally and directionally, at only one speed is adequate. A proposed text for Section 23.161(b)(2) is offered by this commenter. The commenter also suggested that the requirements of Section 25.161(d) be added to the rule. In addition, this commenter states that with the current advances in the design of commuter category airplanes, an out-of-trim requirement, similar to current advances in the design of commuter category airplanes, an out-of-trim requirement, similar to Section 25.255 should be included in Subpart B-Flight. Another commenter notes that the proposal is unclear in that it appears to allow a 10-pound, out-of-trim force under the 3-degree approach requirement for commuter category airplanes. The FAA has reexamined the proposal and considered each of the comments received addressing the proposed changes to Section 23.161. The FAA agrees with the

comment that the current requirement of Section 23.161(c)(2) is an adequate minimum standard and consequently withdraws the proposed change for Section 23.161(c)(2). The FAA does not agree that, as a minimum airworthiness standard, commuter category airplanes should be required to be in trim laterally and directionally at speeds other than that stated in Section 23.161(b), as proposed. The FAA is not aware of any adverse experience concerning the lack of requirements at other speeds for the commuter category size airplanes. With the exception of lateral trim, the FAA considers the current requirement of Section 23.161(d) substantially equivalent to Section 25.161(d) and no adverse experience has been shown because of the lack of a lateral trim requirement in Section 23.161(d). The FAA does not agree that a requirement is needed similar to section 25.255, Out-of-trim characteristics, for commuter category airplanes. The background indicates the requirement was promulgated because of more rapid fuel burnoff with rapid center of gravity shifts in transport airplanes, and due to new designs for handling aerodynamic balance by fuel transfer for normal operations. The FAA is not aware of any adverse service experience because of the lack of such a requirement for airplanes limited to a size approaching that of the new propeller-driven commuter category. The FAA concludes, therefore, a requirement similar to the out-of-trim requirement in Section 25.255 is unnecessary.

Proposal 17 -- No comments were received pertaining to the proposed amendment of Section 23.173, Static longitudinal stability. Accordingly, the requirement is adopted as proposed.

Proposal 18 -- One commenter contends that proposed Section 23.175(b)(1)(i) is incorrect and current Section 23.175 language more accurately describes the section intent and should read as follows: "The speed need not be less than 1.4 (V sub S1) for commuter category airplanes, or 1.3(V sub S1) for other categories." Another commenter states that since Section 23.1583(a)(3)(iii) requires speed limits for commuter category airplanes to be in terms of (V sub MO)/(M sub MO) the existing Section 23.175(b)(1)(i) does not need to be changed since the speeds are covered adequately by existing Section 23.175(b)(1)(iii). This commenter states that since Section 23.21(a) requires all "flight" requirements to be met "at each appropriate combination of weight and center of gravity within the range of loading conditions for which certification is requested," the proposal to evaluate the cruise static longitudinal stability of commuter category airplanes at the maximum takeoff weight is redundant and unnecessary. In addition, this commenter states that the requirement for static longitudinal stability in the cruise configuration of Part 135, Appendix A, paragraph 9(b) has in the past been viewed as a replacement for the high-speed and low-speed cruise static longitudinal demonstrations of Section 23.175(b). Since only minor changes to Section 23.175(b) have been proposed, an explanation and clarification is needed. The FAA has reexamined the proposal, the requirements of Part 135, Appendix A, Section 9(b) (which is the cited source for the proposal), and the

comments received. The proposal needs to be revised to more clearly express the requirements set forth in the cited source. Accordingly, Section 23.175(b) is revised and adopted to achieve this clarification of the high speed cruise requirement for commuter category airplanes.

Proposal 19 -- No comments were received to the proposal. Accordingly, Section 23.333 is amended as proposed.

Proposal 20 -- No comments were received to the proposal. Accordingly, Section 23.335 is amended as proposed.

Proposal 21 -- No comments were received to the proposal. Accordingly, Section 23.337 is amended as proposed.

Proposal 22 -- No comments were received to the proposal. Accordingly, Section 23.349 is amended as proposed.

Comment to Section 23.397. For commuter category airplanes, one commenter contends that the Footnote 1 to the table of forces in Section 23.397 should be changed to read as follows: "...the specified maximum values must be increased linearly with weight to 1.35 times the specified values at a design weight of 19,000 pounds." This commenter suggests a review of CAR 3.212 for the intent of the footnote. Upon review of CAR 3.212 and earlier requirements, the FAA finds that it was included prior to establishment of a 12,500 pound weight limit for small airplanes and called for the provided maximum control forces at 5,000 pounds to be increased linearly with weight by a factor of 1.0 at 5,000 pounds to a factor of 1.5 at 25,000 pounds. This footnote continued to read the same in CAR 3 after the adoption of the 12,500 weight limitation by Amendment 3-10, effective May 16, 1953. When CAR 3 was recodified into Part 23, this note was revised to call for the maximum forces to be linearly increased with weight to 1.18 times the specified values at a design weight of 12,500 pounds which is the factor that would have been obtained from the linear increase called for in the CAR 3 footnote.

The review of CAR 3.212 has shown that the recommended changes would only identify and continue provisions which have been required for airplanes of this size under previous airworthiness standards. Since this recommended change is consistent with previously applied airworthiness standards and will be clarifying by providing the value of the linearly increased factor at the new maximum design weight of 19,000 pounds, the FAA agrees with the contention of this commenter. Footnote 1 to Section 23.397 is amended to the extent that the linear increase must be to 1.35 times the specified values at the maximum permissible weight of 19,000 pounds for the commuter category airplane.

Proposal 23 -- No comments were received to the proposal. Accordingly, Section 23.443 is amended as proposed.

Comment to Section 23.561. For commuter category airplanes, one commenter notes that no proposal has been made to strengthen the maximum load factors of Section 23.561 associated with emergency landing conditions. This commenter contends that the ultimate inertia forces contained in Section 23.561 are far below the level the human body is capable of withstanding. The commenter cites the National Transportation Safety Board (NTSB) 1981 report entitled "Cabin Safety in Transport Category Aircraft" as the source for this information. In response to this comment, the purpose of the proposal was not to reevaluate the maximum load factors associated with emergency landing conditions for all airplanes to be type certificated pursuant to Part 23 at this time. The FAA is considering a revision to the requirements of Section 23.561 within the framework of the Part 23 Airworthiness Review. The comment is beyond the scope of Notice No. 83-17 and cannot be acted on as a part of this rulemaking.

Proposal 24 -- One commenter's opinion is that the structural cornerstone of the safety objectives for transport category airplanes is the requirement that structure should be designed to be damage tolerant unless it can be demonstrated, for particular structural features, that this is impractical. In the latter case, according to the commenter, a safe life evaluation must be made using appropriate scatter factors, and, in practice, this has meant that each primary structure, apart from the landing gear, is required to be damage tolerant. Consequently, catastrophic failures due to fatigue, corrosion, or accidental damage would be avoided. The commenter contends that the NPRM, as presented, allows but does not encourage the adoption of the damage tolerance approach to long-term structural integrity. The comment is made that while the safe-life approach is still valid for the majority of airplanes presented for certification under Part 23 which, because of their low utilization, will never approach their theoretical life limits or which can draw upon a long history of satisfactory service experience on similar designs, the safe-life concept is inappropriate for new commuter category airplanes which will be subjected to a more intensive utilization which equals or exceeds the usage attained by larger transport airplanes. The commenter states that the additional protection against catastrophic structural failure due to corrosion, stress corrosion, accidental damage, or discrete source damage which can accrue from a damage tolerant design policy will bring those safety benefits necessary to meet the FAA safety objectives for this type of airplane. The FAA recognizes the merit of a damage tolerant design; however, the service experience with airplanes recertificated to SFAR No. 41 with their corresponding high utilization does not support the need for a mandatory damage tolerant design philosophy for commuter category airplanes.

Proposal 25 -- No comments were received to the proposal. Accordingly, Section 23.677 is amended as proposed.

Proposal 26 -- No comments were received to the proposal.

Accordingly, Section 23.721 is amended as proposed.

Proposal 27 -- No comments were received to the proposal. Accordingly, Section 23.783 is amended as proposed.

Comment to Section 23.785. Section 23.785, Seats, berths, safety belts, and harnesses. One commenter contends that the problem of inadequate seat strength is well known, and this is an opportunity to bring the requirements closer to reality. The FAA is aware of the possibility that seat-strength requirements in certain areas should be enhanced and it is engaged in research aimed at proposing realistic and attainable dynamic criteria for all seats in small airplanes. To propose requirements before this research is completed, or has at least progressed to the point that realistic criteria are available for application in type certification programs would be premature.

When Notice 83-17 was issued proposing the addition of a commuter category airplane to Part 23, the applicable amendment of Part 23 at that time required the installation of a seat belt and shoulder harness for the front two seats and seat belts for all additional seats. Subsequent to the issuance of Notice No. 83-17, the FAA, in response to a petition for rulemaking, proposed the mandatory installation of shoulder harnesses at all seats in normal, utility, and acrobatic category airplanes with a passenger seating configuration, excluding pilot seats, of nine or less. Amendment 23-32 (50 FR 46872, November 13, 1985) adopted the proposals substantially as set forth in Notice No. 85-11 and because final action had not occurred on the commuter category airplane proposals, the above identified occupant restraint requirements applicable at the time the commuter category airplane was proposed were removed from Section 23.785(g) and replaced by those requirements in Amendment No. 23-32. Since these later adopted requirements do not address the commuter category airplane, the deleted occupant restraint requirements are being reinstated for commuter category airplanes in Section 23.785(g)(2) and the requirements adopted by Amendment No. 23-32 applicable to normal, utility, and acrobatic category airplanes are designated in Section 23.785(g)(1).

The FAA is considering additional cabin safety and occupant protection requirements for the commuter category airplane and will initiate appropriate rulemaking action to address this issue after a thorough study of the need and substance of such additional requirements identified from the study.

Proposal 28 -- One commenter states that the proposed section 23.787(g)(2) should read, "... in paragraphs (a), (b), and (f) of this section." The FAA agrees with the comment and the addition of paragraph (f) clarifies that the requirement applies to baggage compartments as well as cargo compartments in commuter category airplanes since Part 23 does not distinguish between cargo and baggage compartments.

Another commenter contends that the cargo compartment

regulations are insufficient in that most designs have only a porous bulkhead aft and closed inaccessible areas forward. The commenter states that no design for fire retardation of fire extinguishing in these compartments exists and the requirement should incorporate the standards of Sections 25.855 and 25.857. In support of this comment, the commenter states that in the last 3 years alone, one commuter air carrier had four incidents of smoke/fire in unprotected cargo compartments in SFAR No. 41 airplanes. These incidents were caused by various devices shipped by passengers. The contention is that there was no way the crew could have reached a compartment to extinguish a fire if it had occurred. The FAA does not agree that the standards of Sections 25.855 and 25.857 should be adopted for commuter category airplanes. Amendment 23-14, effective December 20, 1973, requires that cargo compartments in all Part 23 airplanes be constructed of materials which are at least flame resistant. Not all cargo compartments in Part 25 airplanes are required to have fire extinguishing provisions, specifically Class D cargo compartments. The FAA considers the requirements as proposed in Notice 83-17 for cargo compartments in commuter category airplanes sufficient. Therefore, the additional requirements applicable to commuter category airplanes are adopted as proposed.

Proposal 29 -- One commenter states that Section 23.807(d)(1)(i), as proposed, should read, "For a total seating capacity of 12 to 15, an ..." This commenter contends that SFAR No. 41, as originally written, overlooked the possibility of airplanes with 11 or fewer seats. The FAA does not agree since normal, utility, and acrobatic category airplanes with a seating configuration, excluding pilot seats, of nine or less with exceptions for airplanes with centerline or fuselage-mounted engines, must have an emergency exit on the opposite side from the main door as specified in Section 23.783. The FAA considers that the minimum acceptable number of emergency exits for commuter category airplanes are those proposed for a total seating configuration of 15 or less to assure adequate egress in an emergency situation by a substantiating emergency evacuation test.

Another commenter contends that the proposed regulations are insufficient and should conform to Section 25.807, to Section 25.809(a) and most importantly to Section 25.809(b). While these exits must be openable from the inside and the outside, the contention is that common sense and experience dictate that rescue personnel should be able to locate and open these exits from the outside. In addition, this commenter states that the exits should be marked as in Section 25.811 and, specifically, must be marked on the outside in accordance with Section 25.811(f) and (g). The FAA recognizes some merit in the contentions of this commenter; however, the FAA considers the proposed requirements to be sufficient and points out that Section 23.783(c), as adopted, requires each external door to be openable from the outside. The issues raised by this commenter need further study before the FAA issues further regulations.

These issues are being considered in the Part 23 Airworthiness Review Program. In addition, the FAA has issued Advisory Circular (AC) 23.807-3, dated January 20, 1984, Subject: "Emergency Exits Openable From Outside for Small Airplanes," on the subject of marking exits openable from the outside, and the Advisory Circular responds to NTSB Safety Recommendation A-82-94. The FAA is not aware of service problems with airplanes recertificated to SFAR No. 41 that would support adoption of the Part 25 requirements.

Proposal 30 -- One commenter suggests that, for consistency with Part 25, the proposed Section 23.809 be presented under Section 23.803. Also, to ensure reliable results from the evacuation demonstration, the criteria of Section 25.803(c), which is not presented in the proposal, should be incorporated or published as advisory material. The FAA finds merit in the section consistency suggestion and the section is renumbered accordingly. In response to this commenter's suggestion with regard to Section 25.803(c), reference should be made to the guidance material of Advisory Circular No. 20-118, "Emergency Evaluation Demonstration From Small Airplanes," dated July 12, 1983. The Advisory Circular sets forth acceptable means, but not the only means, of showing compliance with required emergency evacuation demonstrations from small airplanes. The FAA considers it a satisfactory method of compliance with the regulation as adopted in this final rule.

Proposal 31 -- One commenter contends that the proposed requirement is not consistent with "real world" problems. The assertion is that present designs do not allow for the safe and reasonable carriage of handicapped persons on board and the 9- to 15-inch minimums for aisle widths, as called for by this NPRM, are not wide enough to accommodate the standard life chair used to bring nonambulatory persons aboard. At present, handicapped persons usually have to be placed by the cabin door and, in case of an emergency, could block rapid evacuation. This commenter states that a standard width of 21 inches should be the minimum allowed for any airplane which seats more than 10 passengers and notes that narrow aisles also restrict the entrance and exit of passengers, especially if they are older. The FAA appreciates the concern expressed by this commenter for handicapped persons; however, the service experience with current airplanes meeting the minimum standards of aisle width do not support the need for a change as proposed by this commenter. Another commenter states that the Notice proposes to narrow the minimum aisle width by one-fourth of that required for 10- to 19-seat airplanes in Part 25. This commenter contends that minimum aisle width is an important safety feature if evacuation becomes necessary and that Part 25 standards should be retained. The FAA does not agree that for the new commuter category of airplane the minimum aisle width needs to be the same as set forth for the transport category airplane. The minimum aisle width proposed in the Notice No. 83-17 was the same as that used for the recertification of SFAR No. 41 airplanes. The FAA is not aware of any service-related problems with airplanes so recertificated

which indicate the minimum width of the aisle is not adequate. Therefore, the minimum width for the main aisle is adopted as proposed.

Proposal 32 -- One commenter notes that the word "probably" in the second sentence of Section 23.831(b) as proposed should read "probable." The FAA agrees and the spelling is corrected.

Another commenter states that the expression "harmful or hazardous concentration of gases and vapors" need to be defined and criteria specified. The FAA does not agree that further definition is needed in the regulations. The maximum concentration of carbon monoxide permissible has been stated in Section 23.831(a). The requirement is stated in objective terms to convey the purpose of the rule. In addition, the requirement has been applied in the SFAR No. 41 recertification of airplanes and also in the certification of transport category airplanes without any known adverse experience. The amendment is adopted as proposed.

Proposal 33 -- No comments were received to the proposal to add a new Section 23.851. Accordingly, the requirement is adopted as proposed.

Proposal 34 -- One commenter contends that the proposal does not succeed in accurately incorporating the interior materials burn test requirements of Section 25.853. The most serious is the omission of the 12-second vertical burn test of Section 25.853(b) required by its reference to Part 25, Appendix F, paragraph (d). The FAA agrees with the commenter. The requirements, as stated, would require a vertical test with the flame applied for 60 seconds, whereas Section 25.853(b) requires an application period of 12 seconds. The time period for application of the flame to materials of Section 23.853(d)(3)(ii), therefore, is reduced from 60 seconds to 12 seconds. This commenter notes that in Section 23.853(d)(1) the word "towel" should be plural and the word "probably" in the second sentence should read "probable." The FAA agrees and these changes are made in the final rule. This commenter suggests that the phrase "or other equivalent methods" be changed to read "or other approved equivalent methods" in order to conform to the reading of Part 25. The FAA agrees and has incorporated the phrase "or other approved equivalent methods" in Section 23.853(d)(3)(ii), as suggested.

One commenter states that the address in Section 23.853(d)(3)(iii) for the American National Standards Institute should be 413 Broadway, New York, New York 20018. In addition, the commenter contends that the motion picture film safety requirements is not needed for commuter category airplanes and should be deleted. Inquiry was made to the American National Standards Institute, and the address stated in Notice No. 83-17 is correct as of this date. The motion picture film safety requirement may not be needed for a particular commuter category airplane design. The requirement is retained, therefore, to

assure that the minimum standards are met when motion picture film is used on commuter category airplanes.

Another commenter agrees with the revisions to Section 23.853 where major portions of Part 25 were incorporated. This commenter, and two additional commenters, recommend that Section 23.853 incorporate the requirements proposed in Notice No. 83-14 (48 FR 46250; October 11, 1983) on the subject of flammability requirements for aircraft seat cushions for commuter category airplanes and make changes to Part 135 similar to the changes made to Part 121 in Notice No. 83-14. The contention is that this improvement is even more critical for the commuter category since, most likely, a flight attendant will not be available to take initial emergency action to extinguish a fire. Furthermore, post crash fires pose a serious problem for commuter airplanes and no logical reason appears as to why new designs should not incorporate this life-saving technological improvement.

The FAA appreciates the concerns expressed by the commenters on the issue of requiring seat cushions in commuter category airplanes to meet the test criteria proposed in Notice No. 83-14. The FAA recognizes the merit of the comments. Further study is required, however, with respect to commuter category airplanes and operations conducted in accordance with Part 135. These issues will be considered in the Part 23 Airworthiness Review.

Proposal 35 -- One commenter contends that Section 23.901(b)(3) appears to be redundant as the installation will have to meet the conditions identified in the installation manual required by Section 33.5. The FAA notes that Section 33.5 does not specifically address vibration characteristics which are a significant consideration in the installation of turbopropeller engines in commuter category airplanes and the requirement has been applicable to airplanes certificated to the additional airworthiness standards of Part 135, Appendix A, since 1970. Therefore, the requirement is adopted as proposed.

Proposal 36 -- One commenter contends that Section 23.903(e)(2) should be revised to read: "Means must be provided for stopping combustion and rotation of any engine in flight except that engine rotation need not be stopped if continued rotation could not jeopardize the safety of the airplane." This commenter states that this conforms to the Part 25 requirement and provides a needed clarification, and the last part of proposed subparagraph (e)(2) should be deleted because it already appears in subparagraph (d)(2)(iii) of this Section. The FAA does not agree that Section 23.903(e)(2) should be revised as suggested. First, the proposed requirement of Notice No. 83-17 with respect to stopping combustion and rotation has been required for turbine engines in all Part 23 airplanes since the adoption of Amendment 23-14, effective December 20, 1973, and no reason is offered by the commenter to support the suggested change. Secondly, the last part of proposed Section 23.903(e)(2) concerns the requirements for restarting the engine while Section 23.903(d)(2)(ii) concerns requirements for stopping the engine.

Another commenter contends that the proposal is insufficient and should reflect the provisions of Section 25.903, especially paragraph (d)(1). This commenter states that most commuter/turboprop operators have reported one or more rotor failures per year with the resultant disintegrating residue piercing the fuselage at the pilot's or passenger's compartments. Another commenter states essentially the same concern. The FAA concurs, in part, with these comments. Part 23, however, was revised by Amendment 23-29, effective March 26, 1984 (49 FR 6847; February 23, 1984) and adequately addresses the issue of rotor failure in Section 23.903(b)(1). One commenter states that the proposed revision to Section 23.903(e)(2) is not in accordance with the referenced sources because neither Part 135, Appendix A, paragraph 38(a)(2) nor Section 25.903(c) require a means for stopping the rotation of a turbine engine. This commenter contends that such a feature is required only where continued rotation could jeopardize the safety of the airplane and states that the requirement to stop rotation is both restrictive and unnecessary. The commenter suggests that Section 25.903(c) replace proposed Section 23.903(e)(2). The FAA agrees with the commenter that the requirement for stopping combustion and rotation of the turbine engine is not in the reference sources of Part 135, Appendix A or in Section 25.903(c). The requirement is required by the current version of Section 23.903(e)(2). The commenter offers no data or information to support a change from the present requirement. Accordingly, the requirements are adopted as proposed.

Another commenter notes that systems within a fire zone that are required to be functional after the outbreak of a fire need to be merely "fire-resistant" and perceives an inconsistency between the "fireproof" and "fire-resistant" definitions of Part 1. This commenter contends that for fire-extinguishing systems to be effective and for continued safe flight, the engine must be stopped and the propeller feathered. That commenter suggests that the requirement should be updated to "fireproof." The FAA does not agree. Part 1 defines "fire resistant," in part, as "... the capacity to perform their intended functions under the heat and other conditions likely to occur when there is a fire at the place concerned." Accordingly, the proposal is adopted as stated in Notice No. 83-17.

Proposal 37 -- No adverse comments were received to the proposal. Accordingly, the requirements are adopted as proposed.

Proposal 38 -- One commenter contends that the proposed requirement is insufficient and should incorporate all of Section 23.963. Additionally, the commenter states that most designs cannot comply with paragraphs (c) and (f) of Section 23.963. The FAA does not agree that the requirements are insufficient or that most designs cannot comply with the standards. A review of the provisions of Part 23, together with Section 23.963(f), and Section 25.963 shows that the wording of Section 23.963(a) and (c) are substantially identical to the wording of Section 25.963(a) and (c), respectively. Paragraph (c) of Section 23.963

and Section 25.963 sets forth requirements for flexible fuel tank liners; i.e., Section 23.963(c) requires each flexible fuel tank liner be of an acceptable kind while Section 25.963(c) requires flexible fuel tank liners be approved or shown to be suitable for the particular application. The FAA considers these requirements substantially equal. Proposed paragraph (f) of Section 23.963 is essentially the same as Section 25.963(d), except for the differences in downward ultimate inertia forces between those listed in Sections 23.561 and 25.561 respectively. The substantive differences between Sections 23.963 and 25.963 occur in Section 25.963(f) which contains specific requirements for pressurized fuel tanks to prevent the buildup of an excessive pressure between the inside and outside of the tank. The FAA is not aware of any adverse service experience because Section 23.963 did not address pressurized fuel tanks in Part 23 airplanes. Moreover, the commenter did not present any information or data to support the contention that the present requirements are insufficient. Accordingly, the requirements are adopted as proposed.

Proposal 39 -- The FAA received no adverse comments to the requirements as proposed. Accordingly, the revision to section 23.997 is adopted as stated in the Notice No. 83-17.

Comments to Section 23.1143. Section 23.1143, Engine controls. One commenter contends that Section 23.1143 should be revised to require a flight-idle gate as required by Part 135, Appendix A, paragraph 51. The FAA does not agree that Section 23.1143 needs to be revised as recommended by this commenter and the requirement of section 23.1143(f) was revised by Amendment 23-17, effective February 1, 1977, and provides an equivalency to that of Part 135, Appendix A, paragraph 51, with respect to a flight-idle gate, as stated by this commenter.

Proposal 40 -- The FAA received no adverse comments to this proposal. Accordingly, the requirement is adopted as proposed.

Proposal 41 -- The FAA received no adverse comments to this proposal. Accordingly, the requirement is adopted as proposed.

Proposal 42 -- The FAA received no adverse comments to this proposal. Accordingly, the requirement is adopted as proposed.

Proposal 43 -- One commenter contends that the proposed requirements for fire-extinguishing systems are inadequate and should meet the standards contained in Section 25.1195. This commenter states that passengers to and from the smaller communities deserve the same level of safety in this area as those flying transport category airplanes. Another commenter supports a requirement equal to the standards of Section 25.1195 and contends that the General Accounting Office (GAO) study of safety standards on small passenger airplanes lists the need for more stringent fire-protection systems for small airplanes. This commenter states that the GAO report cites numerous fatal accidents caused by fire which started in the engine and spread

to the wing. The January 4, 1984, GAO report is identified as "U.S. Government Accounting Office, Report to Congress: Safety Standards on Small Passenger Aircraft With Nine or Fewer Seats Are Significantly Less Stringent Than On Larger Aircraft." A third commenter states that proposed Section 23.1195 could cause interpretation difficulties and recommends that for commuter category airplanes, fire zones should be defined and treated in a manner similar to that of Part 25.

The FAA has carefully compared the requirements of Sections 23.1195 and 25.1195. Except for the "each designated fire zone" provision in Section 25.1195, the requirements of paragraphs (a) of Sections 23.1195 and 25.1195 were found to be identical. With the exception of designated fire zones, the substantive requirements of paragraphs (b) of Sections 23.1195 and 25.1195 are contained in the first sentence of each subsection and are identical in wording. Section 25.1195(b) states "how compliance must be shown" in the second sentence of the paragraph, and a similar phrase is not contained within the proposed Section 23.1195(b). The third sentence of Section 25.1195(b) is permissive with respect to the use of individual "one-shot" systems for auxiliary power units, fuel burning heaters, and other combustion equipment. The fourth sentence of Section 25.1195(b) requires for each other designated fire zone, two discharges must be provided, each of which produces adequate agent concentration; whereas Section 23.1195(b) permits an individual "one-shot" system if all other requirements are met by the fire extinguishing system submitted for approval. The wording and, thus, the requirements of paragraphs (c) of Sections 23.1195 and 25.1195 are the same, except Section 23.1195 addresses "each compartment"; whereas, Section 25.1195 addresses "each zone." The FAA, therefore, does not consider the requirements as proposed in Section 23.1195 to be inadequate. Contrary to this commenter's contention, the FAA has determined that the requirements for fire extinguishing systems in commuter category airplanes, with the exceptions noted above, are substantially equal to those required in transport category airplanes. The FAA does not find that the "fire zones" concept for commuter category airplanes is needed.

Proposal 44 -- No adverse comments were received to the proposal. Accordingly, the requirements are adopted as proposed.

Proposal 45 -- No adverse comments were received to the proposal. Accordingly, the requirements are adopted as proposed.

Proposal 46 -- One commenter notes that Section 23.1201(b) requires that components in an engine compartment must be "fireproof" and that provision is consistent with the philosophy of having a serviceable fire-extinguishing system for the full period during which a fire is expected to burn. The FAA agrees and the commenter correctly states the reason each system component of a fire-extinguishing system must be fireproof. Accordingly, the requirements are adopted as proposed.

Proposal 47 -- One commenter notes that Section 23.1203(e) only requires a "fire resistant" standard for wiring and other components of the fire detector system and considers it to be inconsistent with other fire protection requirements. This commenter contends that the last event in the successful accomplishment of fire extinguishment of an engine fire is the resetting of the engine fire detector. This is of particular significance on engine installations where the nacelle is not visible from the flight deck. This commenter suggests that the requirement be upgraded to "fireproof" for wiring and other components of the fire detector system. The FAA does not agree with the need to upgrade the "fire-resistant" standard. Part 1 defines "fire resistant" in part, as follows, "With respect to fluid-carrying lines, fluid system parts, wiring, air ducts, fittings, and powerplant control, "fire resistant" means the capacity to perform the intended functions under the heat and other conditions likely to occur when there is a fire at the place concerned." The FAA has determined the requirements, as stated, is appropriate for fire detector systems and a revision of the section is not needed. Accordingly, the requirements are adopted as proposed.

Comment to Subpart F of Part 23. One commenter states that, in general, the FAA proposals for the systems and general designs of SFAR No. 41C brought the general requirements up to an acceptable level. The FAA agrees with this general comment.

Proposal 48 -- One commenter questions the need for a manifold pressure indictor for engines other than altitude engines; however, since the manifold pressure indicator may give the crew warning of developing engine trouble, the commenter does not oppose the proposal if no objection is received on economic grounds. The FAA received no other comments on this proposal. The requirement has been applied to recertification of SFAR No. 41 airplanes without adverse service experience. Accordingly, the requirement is adopted as proposed.

Proposal 49 -- One commenter contends that experience has shown that proposed Section 23.1309(d) was subject to gross misinterpretation as Part 135, Appendix A, Section 59, and its intent should be clarified, i.e., flight safety and not some nonessential function that may have been peripherally involved in certification. This commenter states that the second sentence of Section 23.1309(d) should be revised to read:

"Where an installation, the functioning of which is essential to safe flight, requires a power supply, the installation must be considered an essential load on the power supply." The FAA does not agree because where an installation requires a power supply and its function is necessary to show compliance with the applicable requirements, the installation must be considered an essential load on the power supply and, accordingly, the applicable requirements are minimum requirements to type certification.

Another commenter states that although portions of Section 25.1309 were incorporated into the proposed Section 23.1309, the commenter sees no justification for not incorporating the whole of Section 25.1309 into Part 23. The commenter offers no data or reasons in support of the contention that the proposal is not adequate or appropriate except that it does not incorporate the requirements of Section 25.1309. In the absence of information to the contrary, the FAA finds the proposed standards appropriate to the commuter category airplane at this time.

One commenter suggests that the expression "safeguard against hazards" should be defined and clarified. Experience with recertification of airplanes to this requirement has not been adverse or controversial. However, Section 23.1309 is being reevaluated in the Part 23 Airworthiness Review Program and these concerns will be addressed relative to all small airplanes. Accordingly, Section 23.1309(d) is adopted as proposed.

Proposal 50 -- No adverse comments were received to the proposal. Accordingly, the requirements are adopted as proposed.

Proposal 51 -- No adverse comments were received to the proposal. Accordingly, the requirements are adopted substantially as proposed.

Proposal 52 -- One commenter notes that proposed Section 23.1351(b)(2), (3), and (4) exclude commuter category airplanes from the present provisions of Section 23.1351 concerning excitation of alternators. This commenter contends that these changes are not a part of the requirements of SFAR No. 41 or of Part 135, Appendix A and, therefore, should be removed. The FAA does not agree. Part 135, Appendix A, paragraph 61(b), requires in part, that the generating system must be designed so that the system voltage at the terminals of all essential load can be maintained within the limits for which the equipment is designed during any probable operating condition. The failure of the battery, as permitted by Section 23.1351(b)(3), may result in the loss of the alternator and the failure of the battery is considered a probable operating condition. The requirements, therefore, are adopted as proposed.

Another commenter states Section 23.1351(b)(5)(ii) supersedes Section 23.1307(b)(1) and provides a higher level of system reliability. This commenter contends that a single master switch, as required by section 23.1307(b)(1), will increase the probability of a total generator electrical failure. This commenter recommends revision of Section 23.1307(b)(1) to read: "(1) Except for commuter category airplanes, a master switch arrangement..."

The FAA does not agree that revision of Section 23.1307(b)(1), as suggested by this commenter, is needed. The master switch arrangement requirement, not necessarily a single master switch as contended, assures expeditious disconnection of all electric power sources by a single action of the pilot for

all load circuits in an emergency situation. The requirements are adopted as proposed.

Proposal 53 -- No adverse comments were received to the proposal. Accordingly, the requirements are adopted as proposed.

Proposal 54 -- One commenter states that to keep the Airplane Flight Manual requirements consistent with transport airplane standards, the relief provided by Section 23.1581(b)(2) should not be allowed for commuter category airplanes and further contends that distinguishing approved information from unapproved information is important. This commenter recommends the addition of "Except for commuter category airplanes," before the words, "The requirements of paragraph (b)(1)..." in Section 23.1581(b)(2). The FAA does not agree with the recommended revision of Section 23.1581(b)(2) because the requirements, as stated, are considered clear and understandable regarding approved information and unapproved information in the Airplane Flight Manual.

No adverse comments were received to the proposed new paragraph (e) to Section 23.1581. Accordingly, the requirement is adopted as proposed.

Proposal 55 -- One commenter states that zero fuel weight should be a limitation in accordance with SFAR No. 41, paragraph 4(a). The FAA agrees and the requirements of Section 23.25, Weight limits, have been revised accordingly.

Another commenter contends that the operating limitations are insufficient, stating that even if spins are not approved, the commuter category airplanes should be tested for spin recovery, which is not required by this regulation. This commenter further contends that a standard method of spin recovery based on these tests should be in the Airplane Flight Manual. The FAA does not agree that commuter category airplanes should be tested for spin recovery because there is no requirement to test any multiengine airplane, normal category or transport category, for spins and spin recovery. This commenter offers no information or data to support a spin and spin recovery requirement.

One commenter states that the requirements of Section 23.1583(c)(3)(ii) concerns ICAO Annex 8 compliance and should be deleted or made optional. The FAA does not agree. The issue of compliance with the requirements of ICAO Annex 8 has been discussed in detail previously in this preamble. Accordingly, the requirement of Section 23.1583(c)(3)(ii) is adopted as proposed. This commenter contends that the reference to Section 23.57 in proposed Section 23.1583(c)(3)(iii) should be deleted. The FAA does not agree. This comment is directly related to establishing the operating limitations for the safe operation of commuter category airplanes and complying with the minimum requirements of ICAO Annex 8. Accordingly, the requirement is adopted as proposed.

Another commenter states that the detailed provisions of proposed Section 23.1583(c)(3) depend upon the final form taken by the earlier requirements dealing with establishing takeoff, climb, and landing performance data. This commenter contends that since many of the performance requirements for transport category airplanes have been proposed for commuter category airplanes, any proposal for requirements relating to performance operating limitations should at least follow a review of the existing provisions of Section 25.1533 and JAR 25.1533. The proposal to require performance operating limitations relating to continued and abandoned takeoff distances, takeoff and initial en route climb minima, landing distance, and go-around climb gradient minima is supported by this commenter. This commenter offers a text which does not differ fundamentally from proposed Section 23.1583(c)(3). Some detailed differences do exist, however, which stem from changes proposed to the requirements relating to establishing performance and an effort to more closely align to the existing provisions of Section 25.1533, JAR 25.1533, Sections 121.189 and 121.195. A new section, Section 23.1533, Additional operating limitations, is suggested by this commenter. The commenter's proposal for Section 23.1533 covers all flight phases in the proposed Section 23.1583(c)(3) of the Notice plus the takeoff run. The commenter states that the takeoff run constraint is necessary if credit is to be allowed for clearways in showing compliance with the takeoff performance operating limitations. This commenter notes that both the FAA and the commenter's proposals for commuter category airplane performance operating limitations go somewhat beyond the corresponding provisions for transport category airplanes of Section 25.1533 and JAR 25.1533, since the proposal in the Notice includes consideration of landing distance. The FAA has carefully considered the comments and suggestions of this commenter. The FAA does not agree that the inclusion in Section 23.1583(c)(4)(i) of the weight at which landing distance is determined in showing compliance with Section 23.75 goes beyond the provisions in Section 25.1533. Section 25.1533(a)(2) includes an equivalent requirement for transport category airplanes. Notice No. 83-17 sets forth requirements which include the intent of the commenter's suggested change. Structuring the airworthiness standards of Part 23 in exactly the same manner as Part 25 or JAR 25 is not needed. Therefore, the requirements are adopted as proposed in the Notice, except that in Section 23.1583(c)(4)(i) "landing field length" is changed to "landing distance" to conform with Section 23.75 as intended in the reference to Section 23.75 in Section 23.1583(c)(4)(i).

Proposal 56 -- One commenter contends that the procedures for a number of maneuvers, unique to the type certification of commuter category airplanes, should be covered in a new subparagraph Section 23.1585(c)(5). These procedures are for continued takeoff following engine failure, an abandoned takeoff, an approach and landing with one engine inoperative, and a one-engine-inoperative go-around. This commenter offers a text for each of these procedures. The FAA does not agree that a

requirement should be added to Section 23.1585, Operating procedures, to specify each type of procedure. The present requirements plus those contained in new paragraph (h) are adequately stated in objective form and encompass the normal and emergency procedures necessary for safe operation of the commuter category airplane. Accordingly, the requirement is adopted as proposed.

Proposal 57 -- One commenter contends that the FAA proposal appears to be incomplete in that by cross-referencing Section 23.1585, the requirement does not exist for the Airplane Flight Manual (AFM) to contain all of the performance data established in accordance with Subpart B - Flight. This commenter offers a revised text as an alternative to Section 23.1587(d)(1) as proposed.

The current requirements of Subpart G - Operating Limitations and Information, however, state the overall requirements in an objective manner to assure safe operation of the commuter category airplane. The current requirements, plus those adopted by this amendment, are considered to be appropriate and assure safe operation of commuter category airplanes at this time. In this regard, the references to Section 23.1585 in Section 23.1587(d)(1) should read Section 23.1583 because it relates to the takeoff weight limits in Section 23.1583 rather than the operating procedure of Section 23.1585. Accordingly, Section 23.1587(d)(1) is adopted as proposed with the exception of the substitution of section 23.1583 for Section 23.1585.

One commenter contends that the text of Section 23.1587(d)(2), (d)(4), and (d)(6), as proposed, related to operating procedures rather than to performance information and is covered by the commenter's proposed revised text of Section 23.1585(c)(5). The FAA does not agree that these requirements relate to operating procedures as such, but rather state the parameters of the conditions under which the performance information was obtained. An examination of the performance information requirements for transport category airplanes revealed similar requirements in Section 25.1587, Performance information. Accordingly, Section 23.1587 is adopted as proposed except as noted in the previous paragraph with regard to Section 23.1587(d)(1).

One commenter contends that the extrapolated performance data required by Section 23.1587(d)(3) should be available for all airplanes which the maximum takeoff weight exceeds the maximum landing weight and the requirement of Section 23.1587(d)(5) should not be limited to just the commuter category airplane. The FAA recognizes the merit of these comments; however, these comments are outside the scope of this rulemaking action.

Proposal 58 -- One commenter notes that paragraph (b) of Appendix F of Part 23, does not address tests for small parts or wire and cable insulation and should be amended by prefacing

paragraph (b) with the words: "Except as provided for materials used in electrical wire and cable insulation and in small parts,..." In addition, this commenter states that paragraph (b) should be revised to refer to tests under paragraphs (d) and (e) of this Appendix plus instructions for mounting the specimen referred to in paragraph (e). The FAA has determined that the prefacing words suggested are not appropriate to paragraph (b) because if the Administrator finds that these items would contribute significantly to the propagation of a fire, these items must then be tested as stated in Section 23.853(d)(3)(v) or by other approved equivalent methods. The FAA agrees with the commenter that paragraph (b) of Appendix F should be revised to refer to the tests under paragraphs (d) and (e), not just paragraph (d) of the Appendix. The FAA also agrees with the commenter that instructions for mounting the specimen referred to in paragraph (e) should be included, and paragraph (b) is revised to include the instructions for mounting the specimen for the horizontal test of paragraph (e). These instructions are substantially the same as those of Appendix F, paragraph (b) of Part 25 which contain an acceptable test specimen configuration for performing the horizontal test.

Another commenter notes that the minimum temperature at the flame center should be 1550 degrees F as stated in paragraph (d). The FAA agrees, and the temperature is changed accordingly.

Proposal 59 -- No adverse comments were received to this proposal. Accordingly, the requirements are adopted as proposed.

Additional Comments

One commenter recommends inclusion of a number of additional requirements from the airworthiness standards of Part 25 for type certification of the commuter category airplane, which this commenter considered necessary, as a minimum, in any regulation dealing with scheduled air transportation.

The FAA is of the opinion that the public should be made aware of these comments and the disposition of them by the FAA. The following areas of Part 25 were addressed by this commenter. The commenter states the requirements of Section 25.631, Bird strike damage, and Section 25.775, Windshields and windows, should be included to assure that the empennage and cockpit windows of commuter category airplanes are capable of absorbing a specified bird strike without incurring flight critical damage to the empennage or the cockpit and/or flight crew. This commenter contends that this category of airplane, because of the planned operating altitudes and stage lengths, will normally be exposed to the possibility of bird strike at a greater rate than most Part 25 airplanes, and because commuter category airplane speed below 10,000 feet will not be much different than the transport category of airplane. Therefore, this commenter states that the commuter category airplane should have the same protection from a bird strike as the transport category airplane. The FAA recognizes the possible merit in the recommendation made by this

commenter; however, this addition is considered to be outside the scope of the original proposal. The FAA has included the recommendations in the Part 23 Airworthiness Review program.

This commenter contends that Section 23.671, Control systems, General, is too broad and lacks specificity in that it does not address failures of the control system. This commenter states that a definite need exists to address both single and multiple failures of a control system in the manner addressed by Section 25.671 and feels confident that most manufacturers are already complying with this requirement; therefore, the requirement should not be a major economic burden. The FAA does not agree that Section 23.671 should be revised to read as Section 25.671. Part 23 contains other requirements for control systems that provide substantially the same level of safety as does Section 25.671. Specifically, the requirements of Section 23.677, Trim system, address the failure of a single element in the primary flight control system and require that subsequent to that failure, adequate control should be available for safe flight and landing.

The commenter contends that the requirements of paragraph (b) stated in Section 25.1303, Flight and navigation instruments, if made applicable to the commuter category airplane, would give the FAA the authority to require basic flight instruments for both the pilot and copilot and paragraph (c) would require warning devices for the more sophisticated commuter airplanes where compressibility is a factor. The reason given by this commenter for this contention depends on the commenter's interpretation of present Part 23 requirements and may not require flight instruments for both pilot and copilot. The FAA does not agree that the requirements of Section 25.1303(b) should be made applicable to the commuter category airplane. The present airworthiness standards provide sufficient flexibility to require flight and navigation instruments at required pilot positions in accordance with Section 23.1321 to safely operate the commuter category airplane without adopting the requirements as stated in Section 25.1303(b). With regard to the comment addressing warning devices as required by Section 25.1303(c), Section 23.1303(e) has substantially the same requirement for a speed warning device as Section 25.1303(c).

Another commenter stated that present Part 23 requirements permit single source information; e.g., static pressure, to be fed to both the pilot's and copilot's instruments. This commenter contends that reports, especially in pressurized airplanes, have indicated that a leak in one instrument or line has caused all static-sensing instruments on both the pilot's and copilot's panels to become totally useless and damaged. The FAA recognizes the merit of this comment; however, the commenter does not provide any data to support the contention. Additionally, the FAA is not aware of any service difficulty problems with the recertification of airplanes to SFAR No. 41 with single source information. Consequently, the FAA is of the opinion that such a requirement should be reexamined during the Part 23 Airworthiness

Review Program.

The comment was received that present Parts 23, 25, 121, and 135 do not address "Floor Proximity Emergency Escape Path Marking." However, Amendments 25-38 and 121-183 (49 FR 43182, October 26, 1984) requiring floor proximity escape path markings for Parts 25 and 121, Rules Docket 23792, address this subject. The commenter recommends that the FAA give serious consideration to incorporating the requirements adopted in Amendments 25-38 and 121-183 into Parts 23 and 135. Further, recommendations were made that the FAA should consider the requirements of emergency provisions in Part 25 for the commuter category airplane and extend the requirements of Section 135.177, Emergency equipment requirements for aircraft having a passenger seating configuration of more than 19 passengers, to include the commuter category airplane. If the requirements of Section 135.177 were extended to the commuter category airplane, then the requirements of Section 121.310 would be included automatically in accordance with Section 135.177(a)(4). The FAA has considered carefully the comments made, reviewed the requirements of Sections 135.177 and 121.310, and has concluded that these requirements are overly stringent, considering the distance between the seats and the nearest emergency exit, for the size of the airplane to be type certificated in the commuter category.

This commenter contends that Part 135, Subpart I - Airplane Performance Operating Limitations, authorizes takeoffs at weights that would not allow an airplane to clear all obstacles if an engine should fail after V sub 1 and recommends that Sections 121.177 and 121.189 - Takeoff limitations, should be required for commuter category airplanes operated in accordance with Part 135. The FAA does not agree with this commenter's contention that should an engine fail after V sub 1, the commuter category airplane would not be able to clear all obstacles. The Airplane Flight Manual contains operating limitations related to one-engine-inoperative takeoff and climb requirements and obstacle clearance requirements when operated pursuant to Part 135, and Section 135.399 prohibits operations beyond these operating limitations. The FAA also considers the takeoff limitations for Part 135 operations with commuter category airplanes substantially equivalent to those requirements stated in Sections 121.177 and 121.189.

This commenter states that the FAA should not authorize Designated Engineering Representatives (DER) or Delegation Option Authorization (DOA) approval of ice protection systems. The contention is that the FAA should be personally involved in both the system approval and flight test program, and this commenter states that their experience has shown that some of those airplanes certificated through the designee program had serious problems with their ice protection systems. The FAA does not agree that designees should be prohibited from the approval of ice protection systems. The involvement of the FAA in approval of ice protection systems by designees is determined on a case-by-case basis. The FAA sees no reason to change this

procedure.

This commenter summarizes by stating a belief that the traveling public would be served better if Part 23 remained as presently written and all airplanes configured for 10 or more passengers were classified in the large transport category and certificated to Part 25 as required by Amendment 23-10 (36 FR 2863, February 11, 1971). The commenter contends that if a particular applicant needed relief from a specific portion of Part 25, the applicant could apply for and gain relief for justified requests. The FAA thoroughly examined the options available to establish airworthiness standards for an airplane of the size proposed for the commuter category and Notice No. 83-17 was the appropriate course to follow. Subsequent events to Amendment 23-10 in addition to the withdrawal of proposed Part 24 - Light Transport Airworthiness Review Program support the need for airworthiness standards for the commuter category airplane by size, weight, and expected operational use. The comments support the decision to amend Part 23, as stated in Notice No. 83-17.

As discussed in the preamble to this amendment, the scope and objective of this rulemaking action are to integrate into Part 23, the airworthiness standards considered necessary for the commuter category airplane. The intent is not to propose substantive changes to Part 23 or to the airworthiness standards being integrated into Part 23, except as discussed in the Notice. The FAA is concerned about bird strike damage to windshields, as suggested by this commenter, and is of the opinion that further study is necessary before rulemaking action is taken on this additional suggestion for commuter category airplanes.

Section 21.17, Designation of applicable regulations. One commenter notes Section 21.17(b) specifies the life of a type certificate application as 5 years for the transport category and 3 years for other categories. Current evidence indicates, according to this commenter, that 3 years is not sufficient for the approval of present Part 23 airplanes; accordingly, 3 years is contended to be inadequate for the commuter category. This commenter recommends that Section 21.17(b) be changed to allow 5 years for all type certificate applications. The commenter submits no data or evidence that the current 3-year time limit for a type certificate application is inadequate. Therefore, the section is not amended under this rulemaking action.

Proposals 60 through 72 -- These proposals were to amend Part 21 to permit the type certification of commuter category airplanes in the same manner as other airplanes. No adverse comments were received to these proposals. Accordingly, the proposals are adopted as stated in the Notice. However, a discussion on the issuance of airworthiness certificates for normal and commuter category airplanes under the provisions of Section 21.183 has been included in the discussion of proposal number 3.

Proposals 73 through 78 -- Two commenters address the issue of the proposed extension of Part 36, Appendix F, standards to the new commuter category airplane. One commenter suggests an applicant be permitted to show compliance with Part 36 by complying with either Appendix F, which contains the standards for propeller-driven small airplanes, or with Appendix C, which contains the standards for transport category large airplanes. The FAA does not concur with this suggestion for two reasons. First, data collected both by the United States and by the International Civil Aviation Organization (ICAO) shows that turbine-powered, propeller-driven airplanes below the 19,000 pound limit would have little difficulty meeting the Appendix F limit. Second, the Appendix C standard was developed primarily for larger airplanes including the large commercial turbojet-powered airplanes. Accordingly, Appendix C involves more precision testing and data correction. Since the Appendix C tests are considerably more expensive to the applicant, the FAA considers the suggestion to be impractical and not in the public interest.

Several comments on the noise issue were received as these issues relate to consistency of the proposed commuter category standards with both existing and future ICAO noise standards for propeller-driven airplanes. As the commenters point out, the United States and ICAO have different rulemaking cycles and, as a consequence, an inconsistency between the two standards will result when the proposals of Notice No. 83-17 are adopted. The United States and members of ICAO currently are developing an improved noise standard for small propeller-driven airplanes. When this cooperative effort is completed, the FAA will consider amending Part 36 to require compliance with these improved standards for appropriate categories of airplanes, including the commuter category.

Accordingly, the proposals to amend Part 36 are adopted as stated in the Notice.

Proposal 79 -- Notice No. 83-17 proposed to amend Section 91.213, Second-in-command requirements, to allow operation of a commuter category airplane without a pilot who is designated as a second in command (SIC) if that airplane is type certificated for operations with one pilot.

Section 91.213 was first adopted on July 17, 1972 (37 FR 14758; July 25, 1972), in response to the safety concerns of the flying public. The majority of the public comments favored the SIC requirements of that section. The only exception to the two-pilot requirement of Section 91.213 is a provision for existing SFAR 41 airplanes. The exception was adopted (47 FR 30946; July 15, 1982) to relieve Part 91 operators of SFAR 41 airplanes of a perceived economic burden. Notice No. 83-17 proposed to allow operation of certain commuter category airplanes without an SIC in essentially the same manner as an SFAR 41 airplane.

The FAA received 28 comments in response to the NPRM. Only one commenter specifically addresses the SIC requirements. That commenter opposes the adoption of the Section 91.213 proposal. Another commenter later submitted a comment opposing those comments.

The Federal Aviation Act of 1958 charges the FAA with the duty of promoting safety of flight of civil aircraft and empowers the FAA to prescribe minimum standards as may be required in the interest of safety. In prescribing these standards, the FAA must make classifications of such standards, as appropriate, to maintain an equivalent level of safety for operations with varying levels of complexity and varying degrees of risk to the public. It necessarily follows that the more complex the operation and the greater the public exposure to risk, the higher the standards that are required.

In this connection, the FAA has had some safety concerns regarding the single-pilot operation of airplanes certificated for operation with up to 19 passengers as proposed in the NPRM. By its very nature, operation of an aircraft with a single pilot cannot provide a level of safety equivalent to operation by a crew of two or more.

There must be some point at which it is reasonable to require two pilots for all operations under Part 91. The current 12,500 pound weight demarcation between small and large airplanes was established more than 40 years ago and was based upon prevailing and anticipated future aircraft design considerations. Whether the demarcation of 12,500 pounds is arbitrary is not an issue in this rulemaking action. However, some line of demarcation must be drawn that will act as a buffer between the competing forces of safety and economics.

The FAA has determined, however, that this rulemaking action should not be delayed, nor is it within the scope of this action, to address all flightcrew requirements for future operations under Part 91. To do so would place an undue economic hardship on aircraft manufacturers who have ongoing airplane certification programs. Nevertheless, the FAA must establish, in the interest of safety, a line of demarcation in this final rule for those commuter category airplanes that need two pilots for all operations regardless of weight or type of operations. Other issues involving flightcrew requirements for Part 91 operations will be handled by a separate rulemaking action.

Based upon a careful review of additional safety data and comments received during the regulatory process, the FAA will amend Section 91.213(a)(1) to require two pilots for all operations of commuter category airplanes except commuter category airplanes that (a) have a passenger seating configuration, excluding pilot seats, of nine seats or less and (b) are type certificated for operations with one pilot. This line of demarcation will be consistent with that of Part 23 for certification of small airplanes and Part 135, which governs the

operations of air taxi and commercial operators.

Based upon the comments to the NPRM and the safety concerns discussed herein, the FAA is requesting further comments on the 9 seats or less demarcation for single-pilot operations under Section 91.213(a)(3). The FAA will review all additional comments submitted. If those comments and further study by the FAA indicate a need to make further regulatory changes, the FAA will initiate the appropriate action prior to the effective date of these amendments. Comments submitted to Docket No. 23516 within 45 days after the publication of this rule in the Federal Register will be considered.

Proposal 80 -- One commenter does not agree with the FAA's decision to classify commuter category airplanes as small airplanes. This commenter contends that numerous safety related items, such as pilot type rating, second-in-command requirements, and flight instruments for the second in command would be required if the airplanes were considered large instead of small. This commenter states that Sections 61.58, 91.4, and all of Subpart D of Part 91 would automatically be applicable when the airplane is being operated in accordance with operating rules other than Part 135. In addition, this commenter states that these same airplanes should have to comply with Section 135.175 which relates to airborne weather radar in lieu of Section 135.173, Airborne thunderstorm detection equipment.

In response to the commenter's position on classifying the commuter category airplane as a small airplane, the FAA has reexamined proposed section 135.4 and has determined that designation of all sizes of commuter category airplanes as small is not appropriate for Part 135. Accordingly, proposed Section 135.4 to identify a commuter category airplane as a small airplane for the purposes of Part 135 is not adopted. Commuter category airplanes have been included in Sections 135.169 and other Sections of Part 135 as discussed in proposals 81 and 82 below.

The FAA agrees with the commenter that the airborne weather radar requirements of Section 135.175 should apply to commuter category airplanes. While this requirement was not specifically proposed in Notice No. 83-17, the FAA will consider whether such an equipment requirement can appropriately be imposed based on the provisions of Section 135.149(e).

Proposal 81 -- No adverse comments were received directly addressing this proposal. However, due to the nonadoption of Section 135.4 as discussed above, Section 135.169 has been revised by changing the wording of Section 135.169(a) to permit the operation of a large commuter category airplane under Part 135 and exempt that category airplane from the cited requirements of Part 121. In some cases, these cited requirements of Part 121 would require the airplane design to include provisions that would be beyond the scope of Notice 83-17. As previously discussed, the FAA is considering additional cabin safety and

occupant protection requirements for commuter category airplanes. The additional requirements of Part 121 will be considered as a part of that rulemaking project. To permit the operation of small commuter category airplanes under Part 135, Section 135.169(b) is adopted as proposed. Because no commuter category airplane could have been operating under Part 135 prior to August 19, 1977, the proposed Section 135.169(c)(2)(iii) is not adopted.

Proposal 82 -- Following the above identified changes to section 135.169, it was also necessary to review the proposal for section 135.399. As proposed, this section contained performance operating limitations for small nontransport category airplanes and commuter category airplanes, with the possibility of confusion occurring. To clearly identify the performance operating limitations for each of these two categories of airplanes, the proposal for Section 135.399 has been revised by providing a new Section 135.398 Commuter category airplane performance operating limitations, which includes only those requirements proposed for commuter category airplanes. Performance operating limitations for small nontransport category airplanes remains unchanged in Section 135.399. In addition, Section 135.363 has been revised by adding a new paragraph (j) to require operators of commuter category airplanes to comply with Section 135.398.

One commenter agrees with a requirement for consideration of the required takeoff flight path data. However, the proposal is keyed to ICAO Annex 8 and the commenter contends that the word "net" should be deleted from the proposed Section 135.399(b). The FAA does not agree since the net takeoff flight path data is required to provide the necessary level of safety for operation of the commuter category airplane under the provisions of Parts 91 and 135. New Section 135.398(b) is adopted as proposed for Section 135.399(b).

Another commenter states that if the intended level of safety is to be achieved, a clear statement is needed regarding the performance operating rules which are applicable to commuter category airplanes. This commenter contends that this need is not met by Section 135.399, either in its existing form or proposed form. The commenter states that since the scheduled performance data for commuter category airplanes is very similar to that of transport category airplanes, any proposed performance operating rules for commuter category airplanes modeled on existing provisions for transport category airplanes in Part 121 would seem reasonable. A proposed text is offered detailing performance operating rules for inclusion in Part 135. The FAA does not agree. The existing requirements, and the amendments adopted by this action, provide for an appropriate level of safety for operations under the provisions of Part 135 for commuter category airplanes and more detailed requirements are considered unnecessary at this time.

Economic Impact

A regulatory evaluation has been conducted and a copy is available in the docket. A copy may be obtained by contacting the person identified under **FOR FURTHER INFORMATION CONTACT**.

This final rule provides for the certification and operation of a new category airplane, the commuter category. To accomplish this end, there are approximately 82 specific changes to the FAR. With four exceptions, all changes are similar in substance to requirements previously applied to propeller-driven airplanes of a size approximating that of the commuter category. The four exceptions require: (1) compliance with ICAO Annex 8, Part III, (2) consideration of obstacle clearance for takeoffs in Part 135 operations, (3) commuter category airplanes with more than 9 passenger seats to be operated in Part 91 operations with a second pilot, and (4) commuter category airplanes to be defined as large and small for Part 135 operations.

There are no additional costs associated with these amendments, since they do not amend the requirements applicable to any existing airplane category, but rather, provide an option for manufacturers to certificate propeller-driven airplanes of this size to requirements other than those applicable to transport category airplanes.

The provisions proposed in the previously withdrawn draft of Part 24 for light transport category airplanes, and the detailed airworthiness standards of Part 25, have not been applied to certification of new airplane designs of the commuter category size because the costs of compliance exceeded the benefits from future sales, purchase, and operation.

The benefits of having a commuter category certification standard in Part 23 are not readily quantifiable. However, based upon a study conducted when the FAA was considering a new Part 24, the cost of certificating a hypothetical 30-seat airplane under Part 25 would have cost $8,000,000 more than certificating under SFAR No. 41, Appendix A of Part 135. The unit cost of production of the airplane certificated to the airworthiness standards of Part 25 would have been approximately $200,000 higher. Clearly certification under Part 25 would be considerably more expensive than under the requirements of Part 23 as amended by this final rule. A copy of the study is filed in Docket No. 18600 for examination by interested persons.

Regulatory Flexibility Determination

The FAA has also determined that the rule changes will not have a significant economic impact on a substantial number of small entities. The FAA's criteria for a small airplane manufacturer is one employing less than 75 employees, and a substantial number is a number which is not less than 11 and which is more than one-third of the small entities subject to the proposed rules, and a significant impact is one having an annual cost of more than $14,258 per manufacturer.

A review of domestic general aviation manufacturing companies indicates that only six companies meet the size threshold of 75 employees or less. The amendments will therefore not affect a substantial number of small entities.

Trade Impact

The amendments to the FAR will improve trade opportunities for both U.S. firms doing business overseas and foreign firms doing business in the United States. In addition, the amendments have the beneficial impact of allowing a wider range of airplanes to be certified under Part 23.

Conclusion

For the reasons discussed earlier in the preamble, the FAA has determined that this document (1) involves regulations which are not considered to be major under the procedures and criteria prescribed by Executive Order 12291, and (2) is not significant under Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). I certify that under the criteria of the Regulatory Flexibility Act, these final rules will not have a significant economic impact on a substantial number of small entities. In addition, these final rules will have little or no impact on trade opportunities for U.S. firms doing business overseas or foreign firms doing business in the United States.

Adoption of the Amendments

Accordingly, Parts 21, 23, 36, 91, and 135 of the Federal Aviation Regulations (14 CFR Parts 21, 23, 36, 91, and 135) are amended effective February 17, 1987.

The authority citation for Part 21 is revised to read as set forth below, and the authority citations following each of the sections of Part 21 are removed:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 1857f-10, 4321 et. seq.; E.O. 11514; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-60

Designation of Applicable Regulations for the Type Certification and Airworthiness Certification of Special Classes of Aircraft

Adopted: March 3, 1987 Effective: April 13, 1987

(Published in 52 FR 8040, March 13, 1987)

SUMMARY: This amends Part 21 of the Federal Aviation Regulations (FAR) by providing procedures for the type certification and airworthiness certification of special classes of aircraft. Special classes of aircraft include gliders (including self-launching gliders), airships, and other kinds of aircraft that would be eligible for a standard airworthiness certificate but for which no airworthiness standards have as yet been established as a separate part of Subchapter C of the FAR. An example of such standards is designated in Advisory Circular (AC) 21.23-1 for the type certification of fixed-wing gliders under Section 21.23. This amendment broadens the concept presently applied to gliders to include airships and future nonconventional aircraft as the need may arise. In addition, this amends Sections 21.21, 21.175(a) and 21.183 to include manned free balloons, which were inadvertently omitted in previous amendments to Part 21.

FOR FURTHER INFORMATION CONTACT: Lyle C. Davis, Policy and Procedures Branch (AWS-110), Aircraft Engineering Division, Office of Airworthiness, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, DC 20591; Telephone (202) 267-9583.

SUPPLEMENTARY INFORMATION:

Background

This amendment is based on Notice of Proposed Rulemaking (NPRM) 85-21, which was published in the Federal Register on October 18, 1985 (50 FR 42368). The NPRM revises the type certification procedural rules in portions of Subparts B and H of Part 21 of the FAR to provide a procedural basis upon which airworthiness criteria may be designated as necessary for the type certification of special classes of aircraft. When the NPRM was published, the FAA had five applications for the type certification of airships. Prior to this amendment, no procedural rules were available for airship type certification.

There are currently numerous commercial development projects related to special classes of aircraft for which application may be made for FAA type certification. Accordingly, the FAA amends Section 21.17 to establish procedural requirements for the issuance of type certificates for special classes of aircraft (including airships) that comply with the applicable airworthiness standards of the FAR or such other airworthiness criteria that provide an equivalent level of safety to those standards. Means are provided to designate applicable airworthiness criteria for the type certification of special classes of aircraft by selecting appropriate provisions of the airworthiness standards currently in the FAR.

In the event that the airworthiness standards in the FAR are either inadequate or otherwise inappropriate as a certification basis for a special class of aircraft, due to its unique, novel,

and/or unusual design features, other airworthiness criteria may be established if the Administrator finds that such criteria provide the special class of aircraft with a level of safety equivalent to that provided for other types of aircraft by the FAR Parts listed in Subchapter C. Such additional airworthiness criteria may be provided by an FAA AC, or, once approved by the Administrator, by a designer, manufacturer, or other person. These airworthiness criteria would be announced in the Federal Register for comment, in a manner similar to that used for AC's, prior to their initial application as the certification basis of a special class aircraft.

Notice 85-21 states that the Administrator would issue special conditions in the event that the standards in the FAR are either inadequate or otherwise inappropriate as a certification basis due to the unique, novel, and/unusual design features for a special class of aircraft. After further review, it has been determined that it would be inappropriate to use special conditions as a part of the certification basis for special classes of aircraft.

Special conditions are issued when it is determined, during a type certification program, that the FAR do not provide adequate certification standards because of a novel or unique feature in an aircraft, aircraft engine or propeller. The process of issuing special conditions was established within the rules to ensure that a timely regulatory process existed, whereby the FAA could add to the existing airworthiness standards listed in Subchapter C, when establishing the certification basis for an aircraft, aircraft engine, or propeller. In the case of special classes of aircraft, some or all of the applicable airworthiness standards are not contained in the FAR, and are established in accordance with Section 21.17(b). In the case of airships, the FAA will issue a report containing airworthiness design criteria it considers to be appropriate for conventional state-of-the-art airships. These criteria, after publication for comment, would become the applicable airworthiness standards for conventional airships. Should an applicant propose to use those standards for an unconventional design, additional airworthiness standards may be necessary. The modified original design criteria or a completely new set of standards could be developed and approved in accordance with Section 21.17(b) without resorting to Section 21.16 for the establishment of special conditions. Thus, while the need still exists for a process to continually update the airworthiness standards, in order to establish an appropriate certification basis for special classes of aircraft with novel and/or unique features, the process for establishing the certification basis in Section 21.17(b) is sufficient to fulfill that need.

Discussion of the Amendment

Special classes of aircraft include gliders (including self-launching gliders), airships, and other kinds of aircraft that would be eligible for a standard airworthiness certificate

but for which no airworthiness standards have as yet been established as a separate part of Subchapter C of the FAR. This amendment establishes procedures for the development and application of airworthiness standards and criteria for special classes of aircraft for which adequate airworthiness standards do not exist in the FAR. The use of these criteria for type certification of special class aircraft is permitted providing the Administrator finds that, to the extent that the criteria do not meet the applicable airworthiness standards cited in Subchapter C, they provide a level of safety equivalent to those standards.

New Section 21.17(b) of the FAR provides a certification procedure for special classes of aircraft that previously lacked a regulatory basis for type certification. Aircraft, including the engines and propellers installed thereon, for which airworthiness standards have been issued as a separate part include: normal, utility, and acrobatic category airplanes, Part 23; transport category airplanes, Part 25; normal and transport category rotorcraft, Part 27 and 29; manned free balloons, Part 31; aircraft engines, Part 33; and propellers, Part 35. These Parts are used by the Administrator, to the maximum extent practicable and as considered appropriate, to designate the applicable airworthiness criteria for the type certification of special classes of aircraft, including the engines and propellers installed thereon.

Prior to this amendment, Section 21.23 established type certification procedures for gliders, both powered and unpowered. In this regard, the FAA issued AC 21.23-1, which provides several acceptable means of compliance for the type certification of gliders. Section 21.23 is deleted by this amendment. However, the concept of Section 21.23 is preserved in the new paragraph(b) of Section 21.17, and AC 21.23-1 will be renumbered as AC 21.17(b)-1 without substantive change.

Pursuant to Section 21.17(a)(1), the applicable airworthiness standards for existing type certificate applications are those in effect on the date of application. Prior to adoption of this amendment, the FAA received several applications for the type certification of airships. Since no procedural rules or appropriate regulations existed for special classes of aircraft (e.g., airships) at the time of receipt of these applications, it is appropriate to allow the applications to remain effective until 3 years after the effective date of this amendment. The applicants may also choose to reapply for a type certificate in accordance with the revised Section 21.17(b).

The term "manned free balloons" was inadvertently excluded in past amendments to Part 21 with respect to the titles of Sections 21.21 and 21.183 and the first paragraph of Section 21.175. Accordingly, this amendment corrects these titles and Section 21.175 to include the term "manned free balloons." In effect, these paragraphs have been interpreted as also being applicable to manned free balloons. Thus, these regulatory

changes have no effect on actual FAA practices. In addition, the term "special classes of aircraft" is added to the title and lead-in paragraph of Section 21.21, and Section 21.175(a), and to the title of Section 21.183 to allow for the issuance of type and airworthiness certificates for special classes of aircraft.

To clarify that special classes of aircraft will be required to have Instructions for Continued Airworthiness similar to those required in the airworthiness standards of Subchapter C, Sections 21.31(c) and 21.50(b) are revised to specify that the Airworthiness Limitations section of the Instructions for Continued Airworthiness constitutes a part of the type design for special classes of aircraft.

There are no other substantive differences between the proposed rule and the final rule.

Discussion of Comments

Six comments were received in response to Notice 85-21, representing the views of aircraft operators, aircraft and equipment manufacturers, and private individuals. The commenters support the objectives of the notice, and some request that the proposals be expanded to provide criteria for determining the degree of specialty or uniqueness. The FAA finds that it is not practical or possible to foresee the types of special class aircraft that may evolve in the future or to attempt to formulate any criteria in anticipation of those types. While gliders and airships are cited as obvious examples of special classes of aircraft, other designs that are not obviously in one category or another will require evaluation on an individual basis.

One commenter contends that the special class aircraft category should be expanded to include small, low-powered, sport-type, aircraft in lieu of Part 23 of the FAR. The FAA intends that the special class aircraft category include those aircraft that would: (1) be eligible for a standard airworthiness certificate; (2) not be eligible for certification under any of the parts listed in Subchapter C of the FAR due to their unique, novel, and/or unusual design features; and (3) have a level of safety equivalent to that provided by type certification under other airworthiness Parts of Subchapter C. The decision to type certificate an aircraft in either the special class aircraft category or under Part 23 of the FAR is entirely dependent upon the aircraft's unique, novel, and/or unusual design features. The level of safety for the special class aircraft category would be equivalent to that provided by Part 23 of the FAR, and, therefore, the level of safety would not enter into the selection of either of these categories in lieu of the other.

The same commenter suggested that ultralight aircraft be included in the special class aircraft category. The FAA is

currently studying the petition filed jointly by the Aircraft Owners and Pilots Association (AOPA) and the Experimental Aircraft Association (EAA) to establish a new category of aircraft entitled primary category. This proposal is envisioned to be applicable to aircraft intended for personal use, and would have simplified design requirements; simplified type certification and airworthiness certification procedures; and simplified, maintenance provisions. Ultralight aircraft would likely fall under such a primary category, if the proposal is adopted as envisioned. However, each design that is not obviously in one category or another will require evaluation on an individual basis.

In a related matter, several commenters suggest that the FAA allow type certification of a simplified aircraft both in the proposed primary category, as defined in the petition filed jointly by AOPA and EAA, and as a special class aircraft under this amendment. It is envisioned that the petitioners' proposed primary category and the special class aircraft category adopted under this amendment will apply to different types of aircraft, and will have different type certification and airworthiness certification procedures. Therefore, type certification of an aircraft in both of these categories would be inappropriate.

One commenter suggested that consideration should be given to adjusting the operating rules to accommodate the unique operating features of special classes of aircraft. Amending operating rules, which is outside of the scope of this rulemaking, would not be practical or possible at this time, since the FAA cannot accurately anticipate all of the unique operating features of future special classes of aircraft.

One commenter requests that his type of aircraft (a rotorcraft derivative) be included in the example for special classes of aircraft. The rotorcraft derivative may qualify under one of the airworthiness regulations listed in Subchapter C. Therefore, this type of aircraft would not qualify under the definition of special classes of aircraft.

Many comments were received in response to the publication of draft AC 21.17(b)-2 and FAA-P-8110-2, "Airship Design Criteria," which were published in the Federal Register on October 18, 1985, (50 FR 42243). Comments on the AC and the Airship Design Criteria, which are not part of this rulemaking, will be considered in the development of the final AC and Airship Design Criteria.

Planned Advisory Circular (AC) and Airship Design Criteria.

The preamble of NPRM 85-21 announced the availability of proposed airship airworthiness criteria, which are contained in AC 21.17(b)-2 and FAA-P-8110-2. These are companion documents that will provide acceptable criteria for type certification of airships as permitted by this amendment. As additional airworthiness criteria for airships are approved, AC 21.17(b)-2

will be revised to identify these criteria.

Economic Analysis

The assumptions used to support the estimates in determining the economic impact of the proposed changes to Sections 21.17, 21.21, 21.31, 21.50, 21.175, and 21.183 have been developed by the FAA. The amendments to Sections 21.175 and 21.183 are editorial and clarifying only and have no economic impact. The anticipated benefit derived from the changes to Sections 21.17, 21.21, 21.31, and 21.50 will be the potential economic value of manufacturing and operating safe airships in the United States (wages, interest, rent, and profits) while maintaining an acceptable level of public safety. Quantification of these benefits is not possible because of the highly speculative nature of potential airship markets and the undetermined time that may elapse before a type certificate is actually issued. Nonetheless, this amendment will provide for U.S. type certification of special class aircraft designs and will also encourage and reinforce commercial development of innovative and utilitarian aircraft. Manufacturers will incur administrative costs, because they will be required to submit type design drawings, test reports, and computations necessary to show proof of compliance with this amendment. The FAA estimates that this effort will involve a maximum total of $104,000 per certification. The anticipated benefits of this amendment include increased convenience and expedition in the type certification process which, in the absence of this amendment, would otherwise consume time to develop a new type certification basis for each special class of aircraft. With this amendment in place, applications for special classes of aircraft type certificates will be processed more quickly since a procedure, and possibly applicable airworthiness standards, for their type certification will already exist. We anticipate the benefits associated with the convenience afforded by this rule will outweigh the costs related to the amendment.

The FAA finds that these costs are consistent with the costs that any future applicant would incur in the process of seeking to obtain a type certificate for a special class aircraft for which no airworthiness criteria have been established in the FAR.

Trade Impact Statement

These rules will have little or no impact on trade opportunities, because newly-manufactured airships for the U.S. market, whether made by U.S. or foreign manufacturers, would have to comply with rules or other criteria which would provide an equivalent level of safety.

Conclusion

The FAA has determined that this amendment (1) is not a major rule under Executive Order 12291; and (2) is not a significant rule under Department of Transportation Regulatory

Policies and Procedures (44 FR 11034; February 26, 1979). Further, it is certified that this amendment will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act, as relatively few small entities will be affected. The FAA small entity size standards criteria define a small aircraft manufacturer as an independently-owned and managed firm having fewer than 75 employees. A substantial number of entities is defined as more than 1/3 of the entities subject to the rule, but not less than 11. Under the FAA size standards, only one of the manufacturers currently applying for an airship type certificate has fewer than 75 employees. A copy of the regulatory evaluation prepared for this action is contained in the regulatory docket. A copy of it may be obtained by contacting the person identified under the caption "**FOR FURTHER INFORMATION CONTACT**."

Adoption of the Amendment

Accordingly, Part 21 of the Federal Aviation Regulations (14 CFR Part 21) is amended as follows, effective April 13, 1987.

The authority citation for Part 21 continues to read as follows:

AUTHORITY: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 1857(f)-10, 4321 et seq.; E.O. 11514; 49 U.S.C. 106(g) (Revised Pub L. 97-449, January 12, 1983).

Amendment 21-61

Noise Standards for Helicopters in the Normal, Transport and Restricted Categories

Adopted: January 21, 1988 Effective: February 5, 1988

(Published in 53 FR 3534, February 5, 1988)

SUMMARY: This final rule adds to the Federal Aviation Regulations noise certification standards applicable to helicopters. This rule applies to civil helicopters in the normal, transport, and restricted categories and provides noise level limits and test procedures for the issuance of original and amended type certificates. The rule prohibits changes in type design of helicopters that may increase noise levels beyond certain limits. This rule does not limit further manufacturing of existing helicopter types. This rule provides for commonality between U.S. standards and those adopted by the International Civil Aviation Organization (ICAO). In addition, the rule contains the technical noise measurement and procedures for conducting and evaluating helicopter noise tests. This rule is necessary to provide current and future relief and protection of the public health and welfare from helicopter noise.

FOR FURTHER INFORMATION CONTACT: Mr. Steven R. Albersheim, Noise Policy and Regulatory Branch, (AEE-110), Noise Abatement Division, Office of Environment and Energy, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, D.C. 20591; telephone (202) 267-3560.

SUPPLEMENTARY INFORMATION:

The purpose of this revision is to amend portions of the Federal Aviation Regulations (14 CFR Part 36) and amend

references to specific rules of Part 36 in other parts (14 CFR Parts 21 and 25). This amendment is based on Notice No. 86-3 (51 FR 7878, March 6, 1986; Docket No. 24929) in which comments were invited. All comments received were fully considered in the issuance of this Final Rule.

Synopsis of the Proposal

Part 36 of the Federal Aviation Regulations (14 CFR Part 36) contains noise standards for aircraft type and airworthiness certification. As the part is currently organized, Subparts B and C and Appendices A, B, and C apply to transport category, large airplanes and subsonic turbojet powered airplanes regardless of type certification category; Appendix F contains the provisions applicable to propeller-driven small airplanes. This amendment prescribes noise levels and test procedures for civil helicopters certificated in the normal, transport, and restricted categories; included are rules governing the issuance of original and amended type certificates for helicopters for which application is made on or after the adoption date of this amendment. The rule prohibits certain growth, or other design changes, if the changes are likely to result in noise levels above prescribed limits. The rule prescribes test conditions and procedures for conducting helicopter noise tests to demonstrate compliance with the prescribed noise levels, including the technical noise measurement and evaluation specifications, employing Effective Perceived Noise Level (EPNL) as the evaluation unit. The helicopter noise standards have the following effects:

Certification Procedures Provisions.

FAR Part 21, as amended, prescribes the procedural requirements for noise certification of civil helicopters certificated in the normal, transport, and restricted categories. These amendments apply to issuance of new type certificates in the normal, transport, or restricted categories for which application was made on or after the publication date of Notice 86-3. The effect of these provisions is to prohibit issuance of the affected certificates after the effective date of the amendments for helicopters which have not been shown to comply with the applicable noise requirements of Part 36. Thus, newly

type certificated helicopters (except those for which application was made before the publication date of Notice 86-3) are required to comply with Part 36 noise standards. Further, the "acoustical change" provisions prescribe requirements that must be met to obtain approval of certain changes in type design of helicopters that may increase noise levels.

Appropriate references to Part 36 acoustical change requirements are contained in Part 21. The acoustical change rules for helicopters apply to any type design change, including operational limitations, that the Administrator determines may increase noise levels of that helicopter, such as changes in rotor size or trim, rpm, number of blades, weight or power. Under this amendment to Part 36, test procedures, conditions, and noise limits for acoustical changes are now prescribed.

Noise Standard Provisions.

FAR Part 36 is amended to prescribe noise standards for civil helicopters certificated in the normal, transport, and restricted categories. These provisions are similar to those currently applicable to other aircraft under Part 36 and are summarized as follows:

General

The general provisions of Part 36, Subpart A, are amended to provide applicability, definitional, and acoustical change provisions covering civil helicopter noise certification. For example, the word "aircraft" is substituted for "airplane" in those provisions where the applicability simply would be expanded to include helicopters. Under this proposal, definitions identify two "stages" or levels of helicopter noise, "Stage 1" and "Stage 2." Stage 2 helicopters are those which have been shown to comply with the Stage 2 noise levels. Stage 1 helicopters are those which have not been shown to comply with Stage 2 levels.

A new section is added to prescribe noise requirements for those changes in type design defined as "acoustical changes" under FAR Part 21. Those provisions apply to acoustical change approvals applied for on and after the publication date of Notice 86-3. Specifically, no increase in any noise level (takeoff, flyover, or approach) is allowed after a change in the type design of a Stage 1 helicopter. For acoustical changes of Stage 1 helicopters, the tradeoff provisions cannot be used to increase any Stage 1 noise level. A Stage 2 helicopter before a change in type design may not be a Stage 1 helicopter after the design change. It should be noted that the ICAO Annex 16 acoustical change standards applicable to Stage 1 helicopters are more stringent than those proposed herein that all helicopters must meet the complete Stage 2 limits after such a change.

The helicopter noise standards apply to all helicopters, as defined under FAR Part 1, except those configurations designated

exclusively for agricultural operations, the dispensing of fire fighting materials, or the transport of external loads. This exception is similar to the one for small propeller-driven airplanes, but is especially important for helicopters since nearly every type has provisions for at least occasionally carrying external loads. Such loads would make it extremely difficult to meet either the weight or performance requirements; thus, the noise standards only apply to internal load configurations. On the other hand, an exclusion of all helicopters with external load capability would defeat the entire purpose of the regulation. It should be noted that these standards are applicable to type certification actions for which applications are received on or after the publication date of Notice 86-3.

Manuals, Markings, and Placards.

The Part 36 provisions regarding requirements for operating limitations in manuals, marking, and placards under current Subpart G is redesignated as Subpart 0 and amended to extend their applicability by including approved Rotorcraft Flight Manuals, manual materials, or placards, as appropriate.

Helicopter Noise Rule.

A new Subpart H to Part 36 prescribes the basic requirements for demonstrating compliance with the helicopter noise rules. The technical standards, conditions, and procedures for conducting noise tests and the helicopter noise limits are presented in the Appendix H.

Noise Measurement and Evaluation.

The new Subpart H to Part 36 is a stand-alone document containing, among other things, the technical specifications for conducting and evaluating helicopter noise tests. With exceptions necessary to account for the unique operating characteristics of helicopters, the rule applies the specifications currently applicable to tests of transport category large airplanes and turbojet-powered airplanes under Appendices A and B of Part 36 (as amended by FAR Amendment 36-9, 43 FR 873, March 2, 1978, and as proposed in Notice 85-2, FR 4172, January 29, 1985).

Highlights of the differences for helicopter noise test under Appendix H and the requirements of Appendices A and B are summarized as follows:

a. Three noise test series are used: takeoff, flyover, and approach. Simultaneous noise measurements are made for each test series at a measuring station under the flight track and at two sideline measuring stations with one on each side of the flight track.

b. Helicopter height and lateral position from the noise

measuring station are measured relative to the referenced flight path.

c. The approach angle for the helicopter approach noise test is 6 degrees (plus/minus 0.5 degrees) rather than the 3.0 degrees + 0.5 degrees used for fixed wing aircraft.

d. Symbols and units appropriate to helicopter noise certification have been substituted for fixed wing aircraft noise symbols in Section A36.7 "Flight Profile Identification Positions" and "Distance-Unit-Meaning" descriptors used in Part 36.

Noise Levels.

The new Appendix H to Part 36 contains helicopter noise levels for which compliance must be shown by actual flight tests. These levels include:
(1) "Stage 1" and "Stage 2" noise limits for each test series which are related to the maximum certificated takeoff weight of the helicopter; (2) tradeoff provisions which govern limited "exceedances" of noise levels for one or two tests series when such exceedances are offset by reductions in the noise levels of the other test series; and (3) separate test conditions for each of the three noise test series including airspeed, altitude, and operational profile over the noise measuring station, power, and helicopter position relative to the flight-track noise measuring station.

"Stage 1" noise limits include prohibition of noise level increases prescribed for "acoustical changes" of those helicopters which cannot achieve Stage 2 noise limits. These limits are prescribed separately for the takeoff, flyover, and approach test series. Depending upon maximum certificated weights of the helicopter, maximum allowable noise levels are between 88 and 108 EPNdB for flyover, 90 and 110 EPNdB for approaches and 89 and 109 EPNdB for takeoff. The highest noise limit applies to maximum weights of 176,370 pounds or more. The noise limit is then reduced by 3.01 EPNdB for each halving of the maximum weight down to a maximum weight of 1,764 pounds.

Tradeoffs of any "exceedances" are limited to a sum not greater than 4 EPNdB with no single exceedances greater than 3 EPNdB; this is consistent with the ICAO standard. (For turbojet powered airplanes, the numbers are 3 and 2 EPNdB respectively.) The exceedances must be completely offset by noise levels below those required at the other two points. The noise level limits apply to helicopters of all weights, just as the noise level limits for other categories of aircraft are applied. However, no United States civil helicopters currently have maximum weights above 50,000 pounds.

This rule allows the first civil derivative of a military helicopter, including those operated by the U.S. Coast Guard, to

be treated as though the military "parent" were a Stage 1 civil helicopter the noise levels of which are more than two dB decibels above the Stage 2 noise level limit. This has the effect of removing noise data requirement from the parent aircraft. Among the reasons for instituting this are: (1) lack of availability of noise level data for military aircraft and; (2) the costs associated with performing test on both versions.

Applicability to current production types.

As noted earlier, the rule is not applicable to helicopter types currently in production as long as an "acoustical change" is not made that may increase noise levels.

Regulatory History

On December 28, 1973, the FAA published an Advanced Notice of Proposed Rulemaking (ANPRM) (Notice No. 73-32; 38 FR 35487) in which it announced that it was considering proposing noise standards for aircraft that were expected to be developed for efficient short stage length operations. It was anticipated that such a class of aircraft, referred to as "short-haul", would include aircraft having short, reduced, vertical or near vertical takeoff and landing capabilities. Since the noise technologies appropriate to those aircraft as a separate class required further study, original FAR Part 36 in 1969 did not prescribe separate rules for those aircraft; some, such as helicopters, were not covered by any regulation. Notice No. 73-32 (ANPRM) was issued as part of an additional study to invite early public participation in the identification and selection of a course, or alternative courses, of action to develop noise standards which would provide additional relief and protection to the public health and welfare from aircraft noise. On July 9, 1979, a Notice of Proposed Rulemaking (NPRM) Notice No. 79-13; (44 FR 42410) was published by the FAA. This notice proposed helicopter noise certification standards and limits on further production of older, noisier helicopter types. The procedures proposed for noise testing in NPRM 79-13 were similar, although not identical, to those proposed in Notice 86-3; however, the proposed noise level limits were significantly more stringent. Information submitted to the Docket indicated that the economic impact on the industry of limiting future production of existing helicopter types might be several hundred million dollars, due to the general unavailability of the noise abatement technology needed to meet the specified noise levels. After careful consideration of the economic impacts of the proposed rule and of the Docket comments on the effects of those impacts, Notice No. 79-13 was withdrawn (December 17, 1981; 46 FR 61486). At the time of withdrawal, the FAA stated that the action neither precluded consideration of similar proposals in the future nor committed the agency to any further or future course of action on this subject.

During the time since Notice No. 79-13 was withdrawn, the FAA has continued to study issues surrounding noise level

certification of helicopters. One of such issue is the ICAO rule, contained in Annex 16, Chapter 8. The United States has been an active participant in modifications to that rule, including raising the allowable noise levels, with the aim of better balancing economic costs and environmental benefits.

As noted before the FAA has been studying issues surrounding noise level certification of helicopters since 1973. On March 6, 1986, a Notice of Proposed Rulemaking (NPRM) ¢Notice No. 86-3, 51 FR 7878| was published by the FAA, based on the comments and issues raised during this period. In addition, the NPRM provided for a commonality between U.S. standards and those adopted by ICAO. This rule revises portions of FAR 14 CFR Part 36 and amends references to Part 36 in other parts (14 CFR Parts 21 and 25) with the purpose of better balancing the economic costs and the environmental benefits.

Aircraft Noise Rules

Public Laws 90-411 and 92-574 were enacted to provide the statutory basis, under the Federal Aviation Act of 1958 (the Act), for relief and protection of the public health and welfare from noise and sonic boom from civil aircraft. Under the Act, the Administrator of the Federal Aviation Administration, after consultation with the Secretary of Transportation and the Administrator of the Environmental Protection Agency, is responsible for the adoption and amendment of rules which prescribe the necessary standards and regulations. On November 3, 1969, the Administrator adopted FAR Part 36 entitled "Noise Standards: Aircraft Type Certification" (34 FR 18355, November 18, 1969). That regulation initiated the FAA noise abatement regulatory program under the new statutory authority by prescribing noise type certification standards for subsonic turbojet powered airplanes regardless of category. Part 36 also prescribed the technical specifications for illustrating compliance with the noise level limits.

In promulgating proposals and amendments under the authority of Section 611 of the Act, factors which the FAA must consider include the following:

1. Available data relating to aircraft noise, including results of research, development, testing, and relating evaluation activities.

2. The appropriate views and position of other Federal, state and interstate agencies.

3. Whether the proposed regulations are consistent with safety in air commerce and air transportation and the public interest.

4. Whether proposed regulations are:

a. Economically reasonable;

b. Technologically practicable; and

c. Appropriate for the particular type of aircraft, aircraft engines, appliances, or certificates to which they would apply.

5. The extent to which the proposed regulations contribute to providing protection to the public health and welfare by carrying out the purposes of Section 611 of the Act. The overall environmental impacts of the regulations including environmental factors other than noise must be addressed in accordance with the National Environmental Policy Act of 1969, and implementing Federal guidelines and directives.

Need for Regulation

FAA data of the active rotorcraft fleet for 1985 shows 2,221 U.S. helicopter operators in the United States utilizing an active fleet of 6,412 helicopters. U.S. corporate/executive use of helicopters accounted for 1,391 aircraft and U.S. commercial helicopters accounted for 4,244 aircraft. The remainder of the fleet are comprised of emergency service aircraft. In 1984, there were 4,020 public use heliports and helistops in the United States. Approximately 9 percent of these heliports are rooftop facilities located in noise sensitive areas. The usage of helicopters is fully recognized in today's society.

For example, city ordinances in Chicago and Los Angeles require that buildings above a certain height be provided with rooftop emergency landing facilities for helicopters because modern fire-fighting apparatus cannot reach above eight floors. As other municipal governments recognize the need to provide increased protection for high-rise inhabitants, the number of heliports for both routine and emergency uses may increase significantly.

The growth of the civil helicopter fleet caused by the increased and more diversified use of helicopters, has intensified the demand for additional heliports. However, environmental concerns are imposing restrictions on heliport operations at an increasing rate. Environmental pressure has also forced closing of heliports with the resultant loss of helicopter services at those locations. The FAA believes that the adoption of appropriate helicopter noise standards will help protect the public by reducing helicopter noise and thereby maintain the benefits of their services in the air transportation system.

One of the key issues in the withdrawal of Notice 79-13 was lack of effective noise abatement technology. To develop this technology, an accelerated joint research program was set up in 1982 by the National Aeronautics and Space Administration (NASA), the FAA, and American helicopter manufacturers. This National Rotorcraft Noise Research Program is a multi-year twenty-million

dollar cooperative effort under the technical guidance of NASA and has two major goals: (1) development of noise abatement technology for reducing helicopter external noise levels and (2) the development of detailed parametric noise prediction techniques. This program is expected to furnish the technological basis for helicopter noise reduction into the twenty-first century and could significantly lower the cost of applications of that technology. At the conclusion of the program, the FAA will consider the appropriateness of lowering the certification noise levels for the helicopters; however, the FAA does not consider it appropriate, in light of the considerations listed in Section 611 of the Act, to delay all rulemaking on noise standards for helicopters until the cooperative research program is completed.

The FAA has evaluated the helicopter as a noise source which affects persons and property and as a result concluded that it is now appropriate to adopt helicopter noise regulations necessary to protect the public health and welfare according to Section 611 of the Act. This rule achieves that objective by preventing further escalation of helicopter noise levels and by laying the regulatory foundation for assuring that future helicopter types and eventually all newly produced helicopters of older type designs comply with realistic noise standards. The FAA has determined that sufficient noise control technology exists to meet the considerations of Section 611(d) of the Act.

Economic aspects of this regulation are discussed in more detail in the rulemaking assessment prepared in conjunction with this rulemaking, and placed in the Docket. However, it should be noted that U.S. manufacturers of rotorcraft are already subject to the ICAO noise certification standards for each helicopter type that they wish to export. Since exports account for approximately 40 percent of the civil sales of U.S. helicopter manufacturers and, since the standards in this rule (except for "acoustical changes" of older, Stage 1 aircraft) are nearly identical to those of ICAO, only minimal cost impacts are expected from this standard. Offsetting these minimal costs are savings which will accrue to American manufacturers by one-time certification in the U.S. rather than certificating in each foreign country as necessary.

Rule Structure

As part of this rulemaking, certain portions of the current Part 36 were reorganized and restructed without any changes in their substance to improve their usefulness and understandability. The technical provisions of Appendices A & B, governing the measurement and evaluation of aircraft noise test data, which were referenced in Notice 86-3, were brought into Appendix H where appropriate. This was done in answer to several comments to the Docket citing confusion over the number and length of referenced sections.

Regulatory Impact Evaluation

The FAA conducted a detailed regulatory evaluation which is included in the regulatory docket and also reviews the changes to FAR Parts 21 and 36. The FAA determined that the rule is consistent with the objectives of Executive Order 12291 and does not impose an unnecessary or unreasonable regulatory burden on the private sector or on the public.

These amendments provide benefits that outweigh the costs of compliance. Specifically, the benefits are the greater acceptability of helicopters and heliports in urban environments and the attendant increased market for helicopters and helicopter services. Thus, the economic benefits accrue not only to the manufacturers and operators, but to the general public as well. The environmental benefits would accrue mainly to those working or residing near heliports, although some noise level improvements can be expected near helicopter flight corridors.

Costs result from increased development and certification expenses and are originally borne by the manufacturers but are expected to be passed on to helicopter operators and eventually to the public. These costs are mitigated by two factors: (1) the National Aeronautics and Space Administration has underway a joint helicopter noise reduction technology program with U.S. manufacturers and the FAA to improve the state-of-the-art and to lower the cost of application and (2) all helicopter models for export are required to comply with ICAO noise standards even if the U.S. were not to adopt the requirements contained in this rule.

Regulatory Flexibility Determination

As detailed in the evaluation, the only cost associated with the changes to FAR Part 36 will be the cost to manufacturers related to the noise certification test. However, no domestic helicopter manufacturer is considered a small entity as is currently defined. Therefore, it is certified that the rule will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

Environmental Analysis

Pursuant to the Department of Transportation "Policies and Procedures for Considering Environmental Impacts" (FAA Order 1050.1D), the FAA has determined that this rule does not constitute a major federal action significantly affecting the quality of the human environment. The amendment has the effect of limiting the growth of noise from new helicopter types and derivatives of existing types. This will reduce noise levels around heliports and, to some extent, under helicopter flight corridors, when compared to unconstrained growth. Little noticeable short-term general effect is expected, since it is estimated that it will take at least five years after adoption of the rule before a significant number of affected aircraft enter

the nation's fleets. However, some helicopter operations and heliports are expected to be designed based upon the lower noise capabilities of newer aircraft, making site-specific improvements in the noise environment. Therefore, no environmental assessment or environmental impact statement was prepared.

Trade Impact Analysis

There will be little or no impact on U.S. or foreign trade from this rulemaking. Absent the rule, U.S. helicopter exports would have been placed at comparative cost disadvantage since each helicopter model still would be required to meet ICAO standards. The cost of multiple certifications would have resulted in either higher selling prices or lower profits to U.S. manufacturers.

Discussion of Comments

Interested persons were afforded the opportunity to participate in development of this rulemaking by submitting written comments to the public regulatory docket on or before June 5, 1986. All comments received have been reviewed and duly considered in promulgating this amendment.

Sixteen public comments were received in response to the notice (Docket No. 24929). All of the commenters supported promulgation of noise certification standards for helicopters; however, each commenter also had specific suggestions about one or more of the FAA's proposed amendments.

The comments received in public Docket No. 24929 are discussed below. They are grouped by broad categories of issues.

Flight Procedures

Notice 86-3 proposed both flight test procedures and flight reference procedures. The first of these procedures gives instructions to the pilots so that the helicopters can be flown allowing realistic variations in weather, piloting techniques, and aircraft performance. The second specifies uniform flight path profiles so that the measured data may be compared to the standard. Several comments were received concerning the amount of variation in flight test techniques that the regulation should allow. Commenters explicitly stated that the rule should allow the helicopter operator to use a "normal" approach during the noise certification test. In addition, some comments claimed that noise data measured during normal approach differs significantly from noise measured under the constant six degree glide slope approach. They further stated that the certification flight test procedures should be used based upon practical "real-world" flight procedures rather than rigidly-prescribed procedures which are seldom used in service.

Much of the concern with flight procedures lies with their effect on the generation of the distinctive helicopter blade

slap. Helicopter noise levels vary between models for different glide slopes. In 1979, the ICAO Committee on Aircraft Noise considered adding a blade slap correction to the calculation of EPNdB for helicopters. However, after extensive investigation, it was determined that the six degree approach would not unduly penalize any particular helicopter type.

Regarding the commenters' position, the development of alternative procedures was pursued by the FAA and the Helicopter Association International which was represented by both operators and manufacturers. However, experience showed that the versatility of helicopters was so great that there was often no single "real world" approach procedure. Conversely, redefining the procedures to allow applicants to choose any normal approach between three and nine degrees would result in an undesirable decrease in the stringency of the standard, unless the noise level limits were adjusted.

Further, it is noted that Section 36.801 specifically allows certification noise measurements to be made using an FAA-approved equivalent procedure. This provision is intended to prevent hardships occurring as the result of the application of an inappropriate certification process.

Lastly, the FAA notes that the six degree approach glide slope has been adopted by ICAO in its helicopter noise certification standard and that both foreign and domestic manufacturers will have to certificate using six degrees, whether or not the United States adopts that procedure. The economic costs of developing and using a separate flight procedure specification that does not conform to the international standard are unjustified.

For the above mentioned reasons, the FAA is adopting the test and reference flight procedures as proposed.

No-Correction Window

The FAA solicited comments on the need for a "no-correction window", i.e., combinations of test and weather conditions that are so close to the standard reference conditions that no corrections to the measured test data are necessary. In response, several commenters expressed the opinion that the rule should have a "no-correction window". Their opinion was that a practical test "window" would limit the cost and complexity of the helicopter certification process.

The FAA believes that since most of the measurements have to be made either to make the corrections or to determine which measurements are inside the "window", it serves little purpose to avoid making appropriate corrections. Cost savings, if any, would be negligible and would be far outweighed by the quality of the data available to the applicant. However, it is noted that the ICAO standard does not require corrections of reported noise levels for small variations from the reference conditions of

flight path, airspeed, weight, ambient temperature, relative humidity, and rotor rpm for the takeoff and approach tests. Only the level flyover test does not have a no-correction window. Because it would be unfair to require American helicopter manufacturers to bear disproportionately high costs, the FAA has determined to follow the lead of ICAO and allow small no-correction windows for takeoff and approach tests.

Upper Bound Weight Limit

The FAA requested comments with regard to establishing an appropriate upper bound to the noise versus weight standards. There are currently no American civil helicopters which have maximum weights above 50,000 pounds. Under Notice 86-3, the noise level limits for takeoff, approach, and sideline would vary with maximum takeoff gross weight. An earlier industry proposal would have the noise limits end at an upper weight of 56,000 pounds.

There were no comments in support of the 56,000 lb. limit. The manufacturers reported that there was no need for such a restriction at this time. One commenter objected to the proposal on the basis that it violated the ICAO agreements. The FAA has determined that there is no valid reason to enact a rule which would have the effect of creating a unique class of unregulated helicopters that would be at a distinct disadvantage on the export market. Therefore, this rule does not contain an upper weight limitation.

Applicability to Current Production

Notice 86-3 proposed establishing noise limits for new and derivative helicopter types, but did not propose to require compliance with the new standards as a condition for further production of current helicopter types. The FAA solicited comments on the appropriateness of this exclusion.

One commenter indicated that the industry had over seven years of notice of this rule. The commenter further indicated that industry consistently opposed the rule, even to the point of successfully arguing for the withdrawal of the original NPRM in 1982. He observed that all helicopters now in production meet the Stage 2 noise limit and, therefore, there is reason to establish a Stage 2 rule for all helicopters in production. This would assure that no Stage 1 helicopters would be produced. Another commenter recommended that the regulation be revised to set a date beyond which Stage 1 helicopters may no longer be introduced into the U.S. fleet. He was concerned that the rule almost ensures that excessively noisy helicopters will continue to be introduced into the fleet.

The FAA recognizes that most, if not all, of the civil helicopters in production were derived from military aircraft. The FAA believes that it would create an undue economic burden on the industry by requiring lower noise levels for which the

military helicopters were originally designed. However, the FAA has a statutory responsibility to ensure that economically reasonable and technologically practicable noise limits are applied fairly and uniformly. The rules prohibit noise level increases from those helicopters which already cannot achieve Stage 2 noise levels before a change in type design. The rule would not allow a Stage 1 helicopter the noise levels of which exceed the Stage 2 noise limits by more than 2 EPNdB to grow in noise after the change in type design. Those Stage 1 helicopters the noise levels of which do not exceed the Stage 2 noise limits by more than 2 EPNdB may "grow up" to the plus 2 EPNdB limit. The FAA believes that this limited growth does not place undue restrictions on industry, but provides a realistic "cap" on the growth of helicopter noise impacts. Even though the rule allows helicopters currently in production to continue to be produced and added to the fleet, the fact still remains that all of the helicopters currently being produced meet Stage 2 limits. The FAA reserves the right to propose a new production rule that would restrict production to Stage 2 helicopters if and when it is warranted.

Stringency

One of the key issues in the public Docket was the stringency of the proposed noise level standards. Several commenters stated their belief that the noise level limits were not stringent enough and noted that the noise level standards were higher than those proposed in Notice 79-13 for both new helicopter types and derivatives. It was also noted that all helicopters currently in production would meet the standard, even though little or no effort had been made by their manufacturers to lower their noise levels. The opinion was expressed that the proposed rule would provide no real protection to the public.

The FAA generally agrees with the comments as far as they go. However, there is more to the issue of stringency than just the noise levels of current helicopters. After all, a certification regulation is actually applied to future aircraft types and to changes in existing types, not to aircraft already in service. In this case, the helicopters for which the regulation is intended are the next generation of high speed, high performance aircraft that will be introduced into service in the late 1980's and beyond. Current civil helicopters are largely derived from military versions. Accordingly, the missions for which they were designed have limited civilian application. However, the new helicopters are being designed for the speed and productivity demanded by a business-oriented economy.

From a technical point of view, new helicopters pose a greater noise control design challenge because the characteristics that would make a helicopter successful in the open market will also make it noisier. For instance, the increased speed and payload capabilities are largely the result of modern, high speed rotor design. As the rotor speed

increases, the noise increases even more. As the payload increases, the rotor loading also increases and so does noise. Thus, the noise level limits will cap the noise to ensure that helicopters do not get noisier as new technology is introduced.

Some have suggested that the FAA should now place a cap on the noise levels with the intention to lower the permissible noise by 3 to 5 decibels in a specific time, possibly five years. The FAA believes that such a suggestion is premature, as NASA and the U.S. industry have an extensive research program under way to provide the tools needed to design and evaluate effective noise abatement technology for new type design helicopters. At the conclusion of the NASA program, the FAA will consider the appropriateness of lowering the noise certification levels of helicopters. Lastly, the standards in this rule are identical to ICAO's standards which industry must meet to maintain its export market and which foreign-made helicopters must also meet.

Test Costs

Several commenters were of the opinion that the complexity of the rule, especially the requirement for correcting the data if the test is performed outside of the "no-correction window," is too costly. For certain helicopter models, the sales are in such small quantities and at such irregular intervals, that a requirement to perform extensive and costly noise certification testing could lead to discontinuing the sales, despite the fact that the helicopter as measured by the FAA meets the noise limits. A commenter stated that because fewer commercial helicopters are being manufactured, the cost of any design modification must be absorbed by these few, increasing the per-unit cost, which is ultimately passed on to the consumer. If sales decrease substantially, the per-unit cost becomes so high as to be totally impractical and the design is no longer profitable. One commenter indicated that the cost of certificating a helicopter to the noise standards in the rule would be approximately $500,000, which exceeds the costs of some helicopters by as much as a factor of ten.

The cost as cited above is unsubstantiated and the FAA estimates the costs to range between $5,000 to $50,000, depending largely on the manner in which the helicopter flight time was billed. Standardization of the FAA and ICAO test procedures should provide further savings. The issue of the complexity of the rule regarding a "no-correction window" resulting in extra cost is not supported. As indicated previously, the manufacturer would be required to make most of the measurements anyway to determine whether the data had to be corrected. The extra cost to adjust the data to a given standard is negligible with today's microcomputers.

Other Issues

Commenters to the Docket raised a number of other technical and editorial issues. One industry group observed that the rule

as proposed in Notice 86-3 was difficult to follow because it repeatedly referenced other sections of FAR Part 36. This was especially noted in those sections which specified acoustical and meteorological instrumentation and correction procedures. Several comments were also received about the organization of Appendix H and about the perceived need to reorganize it more along functional lines. The FAA agrees with these suggestions and has brought into Appendix H most of the materials that were referenced in the Notice. The one major exception to this process is that the definition of the noise metric, Effective Perceived Noise Level (EPNL) and the procedures for computing it, remain solely in Appendix B. This arrangement will insure that the EPNL used for each aircraft category remains consistent with that used for any other category. Any modifications to the basic formulations will automatically apply to all categories.

The contents of Appendix H have been reorganized to make them clearer and easier to follow. The new Table of Contents is at the beginning of the appendix. Typographical mistakes that appeared in the Notice have been corrected. In addition, several minor changes to the test specifications have been made to incorporate test tolerances that correspond to ICAO values and to incorporate metric equivalents where they had been inadvertently omitted.

The Amendment

Accordingly, the Federal Aviation Administration amends Parts 21 and 36 of the Federal Aviation Regulations (14 CFR Parts 21 and 36) effective February 5, 1988.

The authority citation for Part 21 continues to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2); 42 U.S.C. 1857f-10, 4321 et seq.; E.0. 11514; 49 U.S.C. 106(g)(Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-62

Standards Governing the Noise Certification of Aircraft

Adopted: April 14, 1988 Effective: May 6, 1988

(Published in 53 FR 16360, May 6, 1988)

SUMMARY: This final rule revises certain provisions of the regulations prescribing requirements for aircraft noise certification to make them more understandable and easier to use. This amendment also contains substantive regulatory changes simplifying noise certification test and recordkeeping requirements. This regulation is part of the President's

regulatory reform program and is based on the body of good engineering practice that has developed since the original adoption of Part 36 in 1969. It also reflects comments received from the general public and the aviation industry in response to a Petition for Rulemaking from the Aerospace Industries Association of America and to an FAA Notice of Proposed Rulemaking.

FOR FURTHER INFORMATION CONTACT:

Mr. Harvey VanWyen, Noise Policy and Regulatory Branch (AEE-110), Noise Abatement Division, Office of Environment and Energy, Federal Aviation Administration, 800 Independence Ave., SW, Washington, DC 20591: telephone (202) 267-3558.

SUPPLEMENTARY INFORMATION:

The purpose of this revision is to amend portions of the Federal Aviation Regulations (14 CFR Part 36) and amend references to Part 36 contained in other parts (14 CFR Parts 21 and 25). This amendment is based on Notice No. 85-2 (50 FR 4172, January 29, 1985). Comments were invited. All comments have been received and considered in the issuance of this final rule.

SYNOPSIS OF THE PROPOSAL:

Part 36 of the Federal Aviation Regulation (14 CFR Part 36) contains noise standards for aircraft type and airworthiness certification. As the part is currently organized, Subparts B and C and Appendices A,B, and C apply in part to transport category large airplanes and subsonic turbojet powered airplanes regardless of category. This amendment revises these sections of the part to better reflect the actual technical basis for noise certification of aircraft. Substantive changes are made in the noise certification testing, recordkeeping and reporting requirements. The Federal Aviation Administration (FAA) has found that while there will be substantial cost reduction realized as a result of these changes, there will be no net increase or decrease in noise standard compliance stringency for any class of aircraft. Further, this amendment will not result in any increase or decrease in aircraft noise levels.

Changes in Test Requirements

This amendment to the noise certification test requirements is intended to simplify the noise test procedures, to clarify the purpose of the tests, to update equipment specifications to better accommodate the use of modern digital electronics, and to further reduce the number of flight tests conducted solely for approval of relatively minor aircraft modifications. One such change involves decreasing from four to two the minimum number of sideline noise measuring stations which are used to define the maximum sideline noise. By placing the remaining microphones on either side of the point where the jet aircraft reaches 1000 feet or 1440 feet altitude (AGL), the maximum aircraft noise can be

accurately determined at significantly lower costs for equipment, installation, calibration, and data reduction.

Similarly, relative humidity and wind limits on test conditions are eased to maximize available test sites and usable days at those sites. The humidity limit is increased for those applicants using higher-precision instruments, while the wind limit increase is based on wide industry/government experience. The requirement which specifies the location of the meteorological instrumentation is clarified to require that the weather be measured in the vicinity of the noise measuring stations, rather than at the nearest airport.

A number of technical amendments to the analyzer specifications and to the data reporting requirements are adopted to facilitate the use of a wider variety of instrumentation, particularly the newer digital analyzers. Further, because recent computer processing advances make it possible to use data closer to the ambient noise floor and, in some cases, to reconstruct data where parts of the spectrum are below the ambient, greater flexibility is provided to the FAA in approving test and analysis procedures.

One of the major purposes of this amendment is to provide clearer guidelines on the use of nonflight, supplemental tests to meet Part 36 certification requirements. The cost of noise certification of a single jet aircraft type often runs from several hundred thousand dollars to well over a million. Where a long production run of a complex and sophisticated aircraft is anticipated, this cost is generally insignificant when compared to the total development cost of the project. However, to meet the increasingly competitive nature of aviation in this decade, aircraft manufacturers have shortened production runs of standard models and now produce families of related short production run versions. This revision will make it easier to collect a flight data base of sufficient quality and breadth from the first aircraft in such a family so that other related aircraft can be noise certificated using that data base, supplemented by only relatively simple and inexpensive tests and analyses. For instance, noise data from static tests conducted at either the engine or aircraft manufacturer's ground facilities may be approved, as appropriate, by FAA certificating authorities.

Changes in Documentation Requirements

The documentation requirements placed on industry and on individual applicants are reduced as a result of this amendment. These changes will result in lower expenditures in manpower and effort by the government in the review and approval of noise certification documents.

The elimination of certain requirements for prior FAA approval of test procedures greatly simplify the paperwork prior to the test, as well as simplify the test itself. As amended, Part 36 retains the requirement for an approved test plan, albeit

a simpler one. Similarly, the certification report requirement which contains the engineering data supporting the certification also remains.

Reduction of the post-certification paperwork, however, is where this amendment works its greatest effect. Previously, Part 36 required that each Airplane Flight Manual (AFM) must contain all procedures that are employed in the flight test, the certificated noise levels, any weight limitations that were required to meet the noise level requirements, and "other information for the flight crew." While this did not appear to be an onerous burden at the time the original Part 36 was adopted, the FAA has found a number of situations where these seemingly simple requirements have resulted in a distortion of the AFM functions. Several large commercial jet aircraft types have been certificated with hundreds of different versions within each type. As a result, the AFMs contain hundreds of pages of noise "information." Under these circumstances, it becomes extremely difficult to identify which data are applicable to any particular airplane on a given day.

The AFM is a required document providing on-board information necessary for the flight crew. It contains specific aircraft performance data, flight procedures, and aircraft limitations vital to the safe operation of the airplane. As indicated above, noise information is also included. However, after careful consideration, the FAA found that it was appropriate to greatly reduce and simplify the noise portion of the manual. Aircraft weight limits or operating configurations required to meet Part 36 certification will continue to be placed in the limitations section of the AFM. However, beyond this, the FAA feels that only the minimum information necessary to obtain a Part 36 compliance statement and the takeoff, approach, and sideline noise levels for that specific airplane configuration is needed. Thus, the FAA clarifies Parts 25 and 36 to preclude the inclusion of inappropriate information in the AFM.

Other Changes

The acoustical change provisions of Part 21 are clarified by specifically excepting from the noise certification requirements several temporary configurations and conditions used for maintenance. Since none of these conditions represents the permanent configuration of any aircraft type, the FAA finds that this action is consistent with Section 611 of the Federal Aviation Act (as amended).

Numerous references to obsolete **DATES** and conditions are removed to shorten and simplify Part 36 while several sections have been retitled more appropriately.

Regulatory History

Since its adoption in November 1969, FAR Part 36 has been a significant basis for all Federal aircraft noise regulations in

the United States. That regulation was structured to provide a firm, consistent foundation for subsequent rulemaking activities to abate and control aircraft noise. Part 36 includes precise instructions concerning the acquisition, processing, and documentation of noise data from inflight aircraft. As originally promulgated, Part 36 applied only to turbojet aircraft and propeller-driven transport category airplanes over 12,500 pounds maximum gross weight.

Amendment 36-4 (40 FR 1029, January 6, 1975) added noise certification standards for propeller-driven small airplanes. The noise level limits for certain new turbojets and transport category airplanes were lowered in 1977 by Amendment 36-7 (42 FR 12360, March 3, 1977). In 1978, these lower noise level standards were applied to derivatives of older aircraft types. Noise standards for Concorde supersonic transport airplanes were also adopted in 1978 by Amendment 36-10 (43 FR 28406, June 29, 1978).

Amendment 36-9 (43 FR 873, March 2, 1978), which was adopted in 1978, widely revised the test and analysis specifications contained in Appendices A and B of Part 36. The specifications were expanded to include technical details that had been omitted from the original publication. An example of this was the addition of a section on the calibration of acoustical test equipment. Other changes were made to bring FAR Part 36 into substantial agreement with international standards on noise measurement and with the procedures adopted for noise certification by the Internal Civil Aviation Organization (ICAO).

The FAA published (47 FR 47854, October 28, 1982) for public comment, a petition from the Aerospace Industries Association of America (AIA) on behalf of its member aircraft manufacturers for amendment of FAR Parts 21 and 36. Notice No. 85-2 (50 FR 4172, January 29, 1985) contained a **SUMMARY** of the comments submitted to the Docket in response to the petition, and the disposition of the issues raised. Notice No. 85-2 also proposed 41 specific changes to Part 36. A discussion of docketed comments on those proposals and the disposition of the issues follow.

Discussion of Comments

Interested persons have been afforded the opportunity to participate in development of all aspects of this rulemaking by submitting written comments to the public regulatory docket. The period for submitting comments closed April 4, 1985. All comments received have been reviewed and considered in the issuance of this final rule.

Thirteen public comments were received in response to the notice (Docket No. 23340). All of the commenters supported the stated goals and most of the 41 proposed amendments. In addition, nearly every response contained specific suggestions or recommendations about one or more issues.

The comments are discussed below. They are grouped by broad categories of issues.

Acoustical Change

Meeting the noise requirements of Part 36 is one of the steps in the certification approval process for any change to an already certificated aircraft. Included are changes to the aircraft type design which might affect the noise emission characteristics of the aircraft. The definition of acoustical change and the requirement to meet Part 36 standards for design changes within that definition are in Part 21. In Notice 85-2, the FAA proposed to exempt from the definition of acoustical change for turbojet aircraft and transport category large aircraft configured for (a) gear down flight with one or more retractable landing gear down during the entire flight and (b) carriage of a spare engine and nacelle carriage external to the skin of the airplane (and just the pylon or other external mount).

Only two comments were received on this issue. Both supported the proposed change as reasonable and necessary. The FAA agrees and is adopting the modification as proposed.

Aircraft Flight Manual

Over the past several years, there has been some concern that the aircraft operational limits, if any, that are established as a result of FAR 36 noise certification are not being expressed properly in the Aircraft Flight Manual (AFM) when promulgated with reference to the airworthiness limitations. To clarify the intent of the existing regulations, Notice No. 85-2 proposed to add clarifying language in Part 25 (where additional AFM requirements are listed) and in Part 36.

Section 25.25(a) clarifies that the maximum gross weight which meets the noise requirements of Part 36 limits the maximum certification weight. One of the two commenters supported the clarification; the other, a large trade association, reported that some members were opposed while others were favorable. The FAA notes that this provision does not change the regulatory requirement, but simply clarifies the Part 25 certification process by expressly referencing the weight certification requirements of Part 36. The FAA, therefore, is adopting this clarification.

Similarly, Notice No. 85-2 proposed to clarify the definition of Stage 1, Stage 2, and Stage 3 airplanes by categorically stating that each airplane can only be classified in one stage given a specific configuration.

Five commenters responded on this issue. All were opposed to the specific wording proposed for Section 36.1(g) because, in their opinion, the words could be interpreted as requiring each airplane to remain within one Part 36 stage. However, none of

the commenters appeared to object to the stated intent of the proposal and several suggested small changes in the regulatory language to eliminate the problem.

For more than a decade, the FAA has both encouraged and required the application of available noise reduction technology. The goal has been to move Stage 1 aircraft into Stage 2 and Stage 2 aircraft into Stage 3. In most cases, this has been done voluntarily without the need for regulation. The FAA does not intend to inhibit such actions. Therefore, in light of the comments, the FAA has decided to accept the suggestion of one commenter that the regulation should more clearly indicate that an airplane may not be certified to two stages simultaneously or that an airplane may not, without a change in type design configuration, comply with one stage and then another. Further, it should be noted that current regulations clearly prohibit Stage 2 or Stage 3 aircraft from becoming Stage 1 aircraft.

Notice No. 85-2 also proposed three minor changes in Section 36.1581 to clarify that the AFM allows only one certification noise value each for takeoff, approach, and sideline. Since, for flight safety reasons, the AFM on board any airplane may only describe the one current certificated configuration for that airplane, the present rules only require the AFM to have the noise information for that one configuration. As noted in Notice 85-2, the lack of clarity in the Federal Aviation Regulations has caused some manuals to contain detailed noise information on dozens and possibly hundreds of different configurations. The AFM, however, is basically a flight safety document containing vital information for the pilot and crew. While it was determined more than 15 years ago that it would serve a legitimate and useful purpose for the AFM to contain limited noise information, it never was intended for the AFM to become a noise primer on every possible variation in noise levels that might result from changes in configuration, operating procedure, or weather conditions. Thus, Notice 85-2 proposed to consolidate the existing regulations that affect the selection of noise data for the AFM and eliminate the requirement for noise certification test procedures to be included.

Seven comments were received on the proposed amendments to Section 36.1581. All agreed with the need to reduce the volume of noise information in the AFMs and with the proposal to eliminate the requirement for noise certification test procedure documentation. Several commenters expressed concern that the FAA's proposed language would limit the use of several "configurations" that have been approved for both safety and noise. The FAA cannot agree.

An airplane is a versatile machine. In most cases, it is designed and built so that it may be operated with different combinations of weight, speed, flap settings, engine power setting, etc. Combinations of these parameters are optimized by the manufacturer for different missions (range payload, speed, weather, runway length, etc.). Each combination is called a

configuration. Each configuration, in turn, has clearly stated operating limits involving various parameters. These limits are set by the airplane's manufacturer on the basis of safety. Occasionally, these limits may be further restricted by the manufacturer to lower the noise level of the airplane. The FAA oversees this process on each configuration of every airplane type, maintaining first the highest degree of safety. The FAA's approval is called certification. As a part of this certification, the FAA approves the manufacturer's AFM which contains detailed information needed by the pilot and crew to safely operate the airplane within the limitations of one configuration.

An airline or other operator may purchase from the manufacturer the right to use several different configurations of the same airplane. However, for safety reasons it is vital that the pilot and crew know the limitations applicable to the specific configuration that they are flying that day. Thus, FAA safety rules require each AFM to describe only one configuration at any point in time, no matter how many other configurations the manufacturer has sold to the operator. The proposed changes to Section 36.1581 would not change this; they would only restate the existing airworthiness requirement in that portion of Part 36 which deals with AFM information. The FAA believes that this is necessary to avoid confusion. For that reason, the proposed amendments to Section 36.1581 are adopted.

Obsolete Dates and Conditions

Numerous references to **DATES** and conditions that are no longer pertinent to present and future applicants for type certification were proposed for removal under Notice No. 85-2. All commenters to the docket endorsed this activity. Three, however, had comments on specific proposed deletions. A U.S. trade association suggested that "(except as provided in Section 36.7)" be inserted in Section 36.201(b) after the words "type certifications." The FAA does not agree and the language as proposed in the Notice is adopted.

A British trade association and a British manufacturer submitted identical comments suggesting deletion of the provisions, contained in Section 36.7(d), which use the engine bypass ratio in determining which provisions apply to applications for "acoustical changes". The FAA agrees that Section 36.7(d) should be simplified and shortened. However, the FAA also believes that implementation of this specific suggestion would be neither economically reasonable nor technologically practicable. The differing technologies available to high and low bypass ratio engines require different treatment under the regulation. Thus, the FAA believes that implementation of this suggestion would have the effect of restricting the applicability of Part 36 to new type designs and to the first few derivative configurations. Since adoption of this restriction would prevent the FAA from complying with the intent of Part 36, the FAA declines to accept the suggestion.

Certification Reports

Sections 36.1501 and A36.5 contain the documentation requirements for technical data reports on certification tests and results. Notice 85-2 proposed to clarify the required information and further proposed to specifically allow inclusion of data from supplemental test (such as ground-based static tests of engines). This increased flexibility would allow wider use of cost-saving equivalent procedures as long as the data could be analyzed to yield results that would be equivalent to the results of actual aircraft flight tests.

Only one comment was received on the proposed change to Section 36.1501. The commenter opposed the use of "equivalent procedures" such as ground-based static engine tests since such tests by themselves would not be a true measure of the noise increments experienced from an engine change. The commenter states that such changes are often accompanied by changes in nacelles, wing design, fuselage length, and gross weight. The FAA, on the basis of experience, agrees with the reasoning but does not agree with the conclusion. No equivalent procedure has ever been approved (nor would it be under the revised text) under the conditions described where the only supplemental data are those derived from static engine testing. All acoustical and performance data used to develop noise certification levels are based on actual flight tests. The supplemental tests which would be documented under Sections 36.1501 and A36.5 are only used to make adjustments to the flight data where it can be shown that there are no other changes to the noise sources, including their relative contributions to the total noise signature. Supplemental flight data or a totally new flight data base might be necessary to derive the noise level numbers under the cited conditions. For these reasons, and because the proposed change would not affect the approval of equivalent procedures but only the test documentation, the FAA disagrees and adopts the language proposed in the Notice.

Two comments were received on the proposed change to Section A36.5. Both suggested the inclusion of "appropriate propeller powered aircraft performance parameters relevant to noise generation." While the FAA believes this suggestion may be valuable, its inclusion would be outside the scope of Notice 85-2. The FAA will consider including this concept in future rulemaking.

One commenter also noted that the wording of the proposed revision to Section A36.5(b)(5)(vii) would remove the requirement for aircraft height and position data independent of normal flight instrumentation. Since this is a key part of ICAO certification, adoption of the proposed wording could have the effect of invalidating international acceptance of U.S. certifications, along with the attendant economic consequences. The FAA did not intend to remove the requirement for independent height and position data, but agrees that the proposed wording

would have that effect. Consequently, the FAA has decided not to adopt the proposed revision of that section.

Test Procedures

Notice 85-2 proposed nine separate changes in the Part 36 noise certification test procedures. In each case, the intent of the proposed change was to lower the cost of certification without significantly diluting the quality of the noise data used for certification.

Seven comments were received on the proposed changes to Section A36.1(b). All supported the proposed simplifications, although one commenter expressed concern with regard to the FAA's credibility in administering the noise certification process. It should be noted that the FAA continues its commitment to a strong noise regulatory structure. To this end, the FAA has reviewed these procedures with national and international experts and remains confident that the noise certification process will remain intact and effective. Simplification and cost savings are not being purchased by a decrease in stringency or thoroughness.

In response to a British suggestion, the word "height" is substituted for "altitude" in Section A36.1(b)(7) to signify the airplane's height above the local terrain containing the noise measuring sites. Similarly, a test tolerance (500 to 0 ft.) on this height is inserted, because without such a tolerance the airplane would be required to make every test flight 1000 or 1440 ft. above the terrain.

Notice 85-2 proposed to require more accurate measurements of ambient temperature and relative humidity. It also establishes a higher upper limit average wind speed for the microphone and a higher limit crosswind speed average for the aircraft. It also proposed to increase the upper limit average wind speed from 10 knots to 12 knots for the instrumentation and the acceptable crosswind speed for the microphone from 5 knots to 7 knots. The maximum wind speed cannot exceed 15 knots for the instrumentation and 10 knots for the crosswind. The Notice also proposed to clarify that the meteorological variables should be measured in the vicinity of the noise monitors. Widening these weather windows would lower costs to both industry and government by minimizing delays which presently tie up equipment, aircraft, and personnel for days while waiting for specific weather conditions. Five comments were received. One supported the proposal, one wanted to remove all test weather limits under certain conditions, and three foreign organizations objected because of the belief that the Notice proposed maximum winds of 15 knots and crosswind limits of 10 knots. They suggested use of the ICAO limits, 12 and 7 knots, respectively. However, the FAA notes that Notice 85-2 did, indeed, propose the ICAO values of 12 and 7 knots for the upper average limits while also setting maximum values. Therefore, the FAA adopts the proposed revisions.

A number of changes were proposed in the technical specifications for the electronic equipment used in the collection and analysis of the noise data. These changes generally follow the standards adopted by the ICAO and should minimize costs where manufacturers have to certificate to both ICAO and U.S. standards.

Eight comments were received on the proposed revisions to the microphone specifications. Most were general comments on the need to duplicate the ICAO specifications. One specific comment noted that the wording of the last sentence of Section A36.3(c)(2)(ii) varied somewhat from the ICAO standard and that this difference would cause applicants difficulty. After considering the issue, the FAA agrees and the amended specification is adopted with the suggested change.

The FAA also proposed to revise the electronic specifications for the noise analyzer. Earlier specifications were based on the analog system used a decade ago. Notice 85-2 proposed, instead, to update this section, based on the digital equipment currently in use. Since ICAO has not yet adopted similar revisions, most of the seven commenters recommended delaying adoption. However, the FAA believes that the problems encountered by both applicants and government in trying to qualify digital systems under analog specifications require the FAA to act. Thus, the proposed revision to Section A36.3(d) is adopted. However, should ICAO eventually adopt differing specifications, it is the intention of the FAA to issue a subsequent notice proposing adoption of the ICAO standard in the U.S. In adopting Section A36.3(d)(5)(i), the FAA also corrects a typographical error that appeared in the Notice. The correct standard deviation is 0.48 decibels.

Data Correction and Analysis

Notice 85-2 proposed to amend Section A36.5 to clarify the information that is needed to correct the data to standard reference conditions in that the referenced atmosphere should be considered to be homogeneous. Specifically, only those engine performance parameters relevant to noise generation, such as net thrust, engine pressure ratio, exhaust temperatures, and fan or compressor rotational speeds, would be reported. Aircraft sound pressure levels need to exceed the ambient background by only 3 decibels instead of the present 5 decibels. The Notice proposed to allow lower signal-to-noise ratios if the method for separating the signal from the noise is approved by the FAA. Several other amendments to Appendices A and B of FAR 36 were proposed that would make relatively minor changes to mathematical constants in the correction procedures or that would make minor revisions in the description of the procedures. These were considered to be clarifying, not substantive, even when the amount of data to be reported was reduced.

Seven of the commenters responded to these proposed changes with suggestions for improving the clarity of the revisions.

These minor typographical suggestions have been incorporated.

Other Comments

Several respondents to the docket took the opportunity to make suggestions for additional changes and modifications outside the scope of Notice 85-2. Even though some of these comments appear to have merit, the FAA does not believe their cumulative value justifies a delay in issuing this final rule in order to issue a supplemental NPRM.

Section-by-Section Analysis

Part 21

Section 21.93 prescribes the procedural requirements for the approval of changes in type design that may increase the noise levels of an airplane type. Paragraph (b)(2) is amended to add an exclusion for gear down flight with one or more retractable landing gear down during the entire flight and for spare engine and nacelle carriage external to the airplane skin (and the return of the pylon or other external mount).

Part 25

Section 25.25 contains the criteria upon which the maximum weight of an aircraft is based. This section is clarified to note that the highest weight at which compliance is shown with the certification requirements of Part 36 may be, under some circumstances, the limiting maximum weight.

Part 36

The last sentence of Section 36.7(c)(1) is amended to clarify that Part 36 noise tradeoff provisions may not be used to increase non-complying Stage 1 noise levels. The Part 36 tradeoff provisions can be used, however, once the modified airplane qualifies as a complying Stage 2 airplane. This could occur, for instance, when the aircraft increase in weight raised the allowable Stage 2 limit by more than the measured increase in noise.

Sections 36.7(d) and (e) and 36.30(b) are revised to remove obsolete language, **DATES**, and references. Sections 36.201(c) and (d) are deleted for similar reasons.

Section 36.1501 is expanded to clarify the need for approval of equivalent procedures and to allow wider flexibility in the use of non-flight test data to supplement approved flight data bases.

Two subparagraphs are added to Section 36.1581(a) to clarify that only one value for each noise certification test point for

takeoff, sideline, and approach as defined by Appendix C may be placed in the Aircraft Flight Manual, along with associated weight and configuration. Similarly, one value for flyover as defined by Appendix F for propeller driven small airplanes may be placed in the Aircraft Flight Manual. If additional operational noise information is included in the Aircraft Flight Manual, it must be segregated from the certification data in accordance with Section 36.1581(b). The old Section 36.1581(c) is reworded to clarify its intent and redesignated as (d).

Appendix A of Part 36

Section A36.1(b) is revised to allow flight path intercept tests, rather than requiring only full stop takeoffs and landings for every test. This section is also amended to allow a minimum of two symmetrically-placed microphones to measure the sideline noise rather than the minimum of four currently required. Both changes are expected to provide wider flexibility in the choice of test sites and to significantly lower the cost of such tests.

Section A36-1 is revised to expand the flight test weather window when the dew point and dry bulb temperature are measured with an instrument accurate to within one-half degree Centigrade. The allowable winds during the test are increased to those specified in ICAO Annex 16. The requirements to generate noise level versus weight information for takeoff and approach are deleted.

A number of the technical specifications in Section A36.3 are revised to accommodate the use of digital recording and filtering techniques. Section A36.3(e)(7) is revised to require a performance calibration analysis of each piece of calibration equipment at least once every six months.

Section A36.5 contains the requirements on reporting and correcting measured data. Section A36.5(b) is revised to eliminate the need to obtain engine performance data solely from flight instrumentation or manufacturer's data. By this revision, static tests and other sources of supplemental data can be employed. Section A36.5(c) is also amended to indicate that the noise certification atmosphere is homogeneous. That section is also amended to replace an erroneous reference to "design" landing weight with the correct reference to "maximum," landing weight.

Section A36.5(d) is amended to accept one-third octave band data that are at least 3 decibels above the mean background noise in that band. Before this amendment, the data had to be at least 5 decibels above ambient. This change permits greater flexibility in the choice of test conditions and is particularly necessary for the test of quiet airplanes. Greater flexibility is also provided by the approved use of time/frequency interpolation and equivalent procedures within the indicated limits.

Section A36.5(e) is revised to add a new paragraph (4) which specifically allows the orderly development of noise certification for certain derivatives of aircraft type design, and provides simplified methods for computing the 90 percent confidence limits for those derivatives.

The requirements in Section A36.9(b) for locating meteorological measurements have been changed to permit their placement near the measuring stations, rather than using meteorological data from the nearest airport. This is intended to improve the quality of the meteorological data in those cases where the flight tests are not conducted at an airport. Another change to the meteorological specifications is made in Section A36.9(d)(2) where the criterion for using the simplified method for deriving the values of the atmospheric coefficients has been broadened. Accordingly, the simplified method may be used if the atmospheric absorption coefficients do not vary over the sound propagation path of the maximum noise by more than plus or minus 1.6 decibels per thousand feet in the 3150 Hertz one-third octave band.

Section A36.11(a)(3)(v) is amended to delete the requirement for graphical or tabular data presentations during data correction. These corrections may not be done by computer or other appropriate means.

Several small corrections are made to Section A36.11(e). One up**DATES** a cross-reference to Sections A36.11(b) and (c), while the others correct a mathematical constant used in the Delta 2 calculations for takeoff, approach and sidelines.

Section A36.11(f) is completely revised and considerably shortened to provide clearer guidance or appropriate correction procedures when the takeoff and/or approach noise measurements are made at non-standard locations. Two alternative methods are provided.

Appendix B of Part 36

Section B36.5(h) and Table B-2 are revised to eliminate calculation of tone penalties for tones less than 1.5 decibels.

Sections B36.9, B36.11, and B36.13 contain the technical and mathematical details of the methods for calculating Effective Perceived Noise Levels (EPNL). Several small changes are made in the formulation to simplify the computerized procedure.

Appendix C of Part 36

Sections C36.5(c), C36.7(d), and C36.9(d) are deleted as unnecessary and the subsequent sections are redesignated accordingly. Sections C36.7 and C36.9 are retitled to better describe their functions.

Regulatory Impact Evaluation

The FAA conducted a detailed regulatory evaluation which is included in the regulatory docket. This evaluation assesses the economic impact of all changes to Parts 21, 25, and 36. The FAA has determined that this rule is consistent with the objectives of Executive Order 12291 as part of the President's Regulatory Reform Program to reduce regulatory burdens on the public. This rule imposes no additional costs on the Federal government.

The amendments in this rule will provide benefits in the aggregate to the aviation industry and the general public. These benefits arise from deletion of unnecessary noise certification testing and recordkeeping requirements, clarification of regulatory text, and relaxation of certain test and documentation requirements. The amendments better reflect new technologies and consequently many amendments are clarifying and editorial in nature. As an overall result of these amendments, the regulations are more concise and easier to understand. None of the amendments are expected to result in a major cost to the aviation industry. There are 10 amendments which are expected to yield minimal to minor benefits and three amendments are expected to result in minimal to minor costs. One of the amendments which will reduce from 4 to 2 the number of sideline measurement stations needed as part of the aircraft noise certification process is estimated to save manufacturers approximately $2.0 million discounted over a 10 year period. For the reasons stated above, the benefits flowing from these amendments substantially outweigh any associated costs.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires government agencies to review rules which may have a "significant economic impact on a substantial number of small entities."

These amendments directly impact large manufacturers of aircraft. The FAA size threshold for a determination of a small entity for aircraft manufacturers is 75 employees; that is, any aircraft manufacturer with more than 75 employees is considered not to be a small entity. Based upon this size threshold, the aircraft manufacturers affected by this rule are not small entities. Moreover, of the potential cost impacts, three require minimal computer programming changes which can be accomplished in-house. One of the amendments is estimated to save the manufacturers approximately $2.0 million. The remaining changes are editorial in nature. This rule will not have any significant economic impact.

Therefore, the FAA certifies, this rule will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

Environmental Analysis

Pursuant to Department of Transportation "Policies and Procedures for Considering Environmental Impacts" (FAA Order 1050.1D), a Finding of No Significant Impact has been made. These amendments are primarily administrative, clarifying and organizational, and do not significantly affect the quality of the human environment.

Conclusion

For the reasons stated above, the FAA has determined that this document involves a regulation which is not major as defined in Executive Order 12291 and not significant under Department of Transportation Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). In addition, the FAA certifies that under the criteria of the Regulatory Flexibility Act this final rule will not have a significant economic impact on a substantial number of small entities. A copy of the regulatory evaluation may be examined in the regulatory docket or obtained by contacting the person identified under the caption "FOR FURTHER INFORMATION CONTACT."

The Final Rule

Accordingly, the Federal Aviation Regulations (14 CFR Parts 21, 25, and 36) are amended, effective May 6, 1988.

The authority citation for Part 21 continues to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 1857f-10, 4321 et seq.; E.O. 11514; 49 U.S.C. 106(g)(Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-63

Noise Certification Standards for Propeller-Driven Small Airplanes

Adopted: September 23, 1988 Effective: December 22, 1988

(Published in 53 FR 47394, November 22, 1988)

SUMMARY: This final rule, which is based on Notice 86-10 (51 FR 25500), revises noise certification standards for propeller-driven small airplanes and propeller-driven, commuter category airplanes by substituting the use of actual takeoff tests for the level flyover tests currently specified. Subsequent to the publication of Notice 86-10, Parts 21, 23, 36, 91, and 135 of the Federal Aviation Regulations (FAR) were amended to adopt certification procedures, airworthiness and

noise standards, and operating rules for an additional category of propeller-driven, multiengine airplane, designated as the Commuter Category. As a result of these amendments, propeller-driven, commuter category airplanes have been included in this final rule. This rule revises noise certification test procedures as of December 22, 1988, and revises the noise level limit numbers to approximate the sound levels measured and corrected in accordance with Appendix F of Part 36. This rule resulted from industry requests that noise certification be more directly based upon typical in-service noise measurements and from studies conducted over a three year period under the auspices of the International Civil Aviation Organization. The rule exempts both antique airplanes and airplanes modified by the addition of floats or skis from the acoustical change measurement and documentation requirements of Part 21.

DATE: Effective date of this amendment is December 22, 1988. The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of December 22, 1988.

FOR FURTHER INFORMATION CONTACT: Mr. Steven Albersheim, Noise Policy and Regulatory Branch (AEE-110, Noise Abatement Division, Office of Environment and Energy, Federal Aviation Administration, 800 Independence Ave., S.W., Washington, D.C. 20591; telephone (202) 267-3560.

SUPPLEMENTARY INFORMATION:

Synopsis of the Final Rule

Part 36 of the Federal Aviation Regulations (14 CFR Part 36) contains noise standards for aircraft type and airworthiness certification. Appendix F of Part 36 contains the provisions currently applicable to propeller-driven small airplanes and propeller-driven, commuter category airplanes. Compliance with Appendix F is now determined by a level flyover test for which the measured noise is subjected to a calculated "correction" to account for differences in aircraft performance between level flight and takeoff. This rule amends Part 36 by adding an Appendix G to include actual takeoff noise tests, instead of the present level flyover test, eliminating the need for the performance correction. The amendment provides the test conditions, procedures, and noise levels necessary to demonstrate compliance with certification requirements. The new noise standard affects the following items:

Certification Procedure Provisions

The new rule amends FAR Part 36 by adding an Appendix G which contains the specifications for conducting takeoff noise certification tests. This appendix also contains procedures for adjusting measured noise data for the differences in aircraft performance and acoustic propagation between the test day and the

reference standard day. The effective date for Appendix G is December 22, 1988.

Noise Level Standard

Appendix G provides for the continued use of the A-weighted sound level (LA) as the noise measure for propeller-driven small airplanes and propeller-driven, commuter category airplanes.

The Appendix G noise level limit is simply a translation of the current Appendix F noise limit which accounts for the difference in noise level resulting from the change in test airspeed and distance that the airplane is from the microphone. Even though the Appendix G noise level limit is not 5 decibels higher than the Appendix F limit, no change in absolute noise level requirements is expected to occur from this amendment.

Acoustical Change.

FAR Part 21 has been amended to remove the present limitations on acoustical changes. These limitations were based on the use of the level flyover test and had no provision for increased airplane weight or decreased performance. With this revision, FAR Part 21 now uses one acoustical change provision for all airplanes that are noise certificated using a takeoff test.

The revision to FAR Part 21 also exempts from the acoustical change requirements antique airplanes, i.e., those that had flight time before January 1, 1955, and airplanes modified by the addition of floats or skis. The owners of antique aircraft often experience difficulty in finding airworthy parts, e.g., engines, needed to keep aircraft in safe operable condition. They, therefore, often opt to make changes based on current parts availability and safety. The typical operator of an antique aircraft owns only one airplane and the acoustical change situations arise infrequently; thus, the FAA does not believe that adding noise requirements is justified either economically or environmentally.

Regulatory History

On December 31, 1974, the FAA adopted noise standards (40 FR 1029) for propeller-driven small airplanes, which prescribed noise standards for the issue of normal, utility, acrobatic, transport, and restricted type certificates. The rule also prescribed noise standards for airworthiness certificates and restricted category airworthiness certificates for newly produced propeller-driven small airplanes of older type designs. Finally, the rule prohibited acoustical changes in the type design of those airplanes where those changes increased noise levels beyond specified limits. Section 611 of the Federal Aviation Act of 1958 (49 U.S.C. 1431), as amended by the Noise Control Act of 1972 (P.L. 92-574) provided the statutory authority for the provisions published in Notice 73-26 in the Federal Register on October 10,

1973 (38 FR 28016). A corrective amendment was published in the Federal Register on February 11, 1975 (49 FR 6346). The adopted standards were again amended (41 FR 56506; December 23, 1976) as a result of two proposals submitted to the FAA by the Environmental Protection Agency (40 FR 820, January 3, 1975, and 40 FR 1061; January 6, 1975).

A further amendment (45 FR 67064, October 9, 1980) applied to new production of previously exempt agricultural and fire-fighting airplanes (without flight time before January 1, 1980), and to acoustically changed airplanes (without flight time in the changed configuration before January 1, 1980) that had not been shown to comply with Part 36 noise levels.

In May 1983, the International Civil Aviation Organization (ICAO) Committee on Aircraft Noise recommended replacing the ICAO flyover noise standard with a takeoff noise standard. In July 1986, a Notice of Proposed Rulemaking (NPRM) was published in the Federal Register (Notice 86-10, 51 FR 25500; July 14, 1986) to solicit comments on the proposal to revise noise certification for propeller-driven small airplanes by substituting the use of actual takeoff tests for the level flyover tests specified in Appendix F of Part 36. This final rule is substantially the same as the ICAO recommendation, except for microphone placement and associated noise limits.

Need for Regulation

The noise certification method for propeller-driven small airplanes contained in Appendix F approximated the takeoff noise by requiring level flyovers and making "corrections" calculated from measured or assumed aircraft performance. However, ground measurements recorded during actual takeoffs seldom agreed with the Appendix F certification levels. As a result, the General Aviation Manufacturers Association suggested that the noise certification rules should be changed to employ actual takeoff noise measurements. Thus, the purpose of this amendment is only to change the noise testing procedure and not to lower the absolute noise limitations.

Additionally, under Section 611 of the Federal Aviation Act of 1958, as amended (the Act), the FAA Administrator, in prescribing or amending aircraft noise regulations, is required to consider, among other things, whether the action is consistent with the highest degree of safety in air commerce and whether it is economically reasonable, technologically practicable, and appropriate for the particular type of aircraft to which it would apply. The FAA believes that this final rule meets the requirements of Section 611 of the Act.

Rule Structure and Timing

As a part of this rule, an Appendix G has been added to Part 36. This appendix is structured along the general lines of Appendix F which contains the requirements for noise

certification of propeller-driven small airplanes and propeller-driven, commuter category airplanes using the level flyover test. While both procedures share some common elements e.g., the use of the A-weighted decibel as the unit of noise measure), their differences are so pervasive that concern for the clarity of the resulting regulation requires the use of a separate appendix.

Similarly, to preclude questions of the applicability of each procedure, the FAA will require the use of Appendix G for all tests conducted on or after December 22, 1988, regardless of the date of application for type certification. This will eliminate the regulatory burden that would be imposed on applicants if different standards and tests were required for different airplanes, or models thereof, in the same product line. On or after December 22, 1988, all noise certification tests will be conducted pursuant to Appendix G.

Analysis of the Amendments

The amendment to establish a takeoff test procedure for the noise certification of propeller-driven small airplanes and propeller-driven, commuter category airplanes revises existing Parts 21 and 36 to the Federal Aviation Regulations (14 CFR Parts 21 and 36) as follows:

1. Section 21.93 defines changes to an aircraft type design which require recertification for noise, i.e., acoustical changes. Recertification for those "acoustical changes" for propeller-driven small airplanes and propeller-driven, commuter category airplanes was limited to (a) changes to or removal of mufflers or similar noise-control components or (b) increases in installed power or propeller tip speed. This amendment expands the definition of acoustic change. As amended, Section 21.93 states that any voluntary change in the type design of an airplane which may increase the noise levels of that airplane is an "acoustical change". This change allows one "acoustic change" definition to be used by all airplanes.

Section 21.93 has also been amended to eliminate recertification for acoustic change for antique airplanes and land-based airplanes which only add (or substitute) floats or skis to already certificated wheeled aircraft. Recertification for acoustic change is required for acoustic changes made after a wheeled aircraft has been reconfigured with floats or skis. The new definition of "antique" airplane is limited to U.S. registered airplanes with flight time prior to January 1, 1955. As amended in this respect, Section 21.93 is not consistent with Section 45.22(b) which grants an exemption to antique aircraft from nationality and registration marking. There is no change in airworthiness certification requirements as a result of this rule.

2. Two additional technical publications have been incorporated by reference in Section 36.6. The publications

contain technical specifications for noise measurement and analysis equipment and are available from the International Electrotechnical Commission. Section 36.6 provides information concerning the purchase of these additional publications and a listing of the U.S. Government offices where the publications are available for inspection. The listing of these offices has been updated to account for changes which occurred subsequent to publication of Notice 86-10. However, this change does not effect the scope of this final rule.

3. Section 36.9 has been amended to require that noise tests conducted for acoustical changes be performed in accordance with Section 36.501. At present Section 36.9 requires compliance with Appendix F. However, Section 36.501 directs applicants to the appropriate appendix.

4. Section 36.501 has been expanded to direct applicants for new, amended, and supplemental type certificates to the appropriate noise limit in Appendix F for certification tests completed before December 22, 1988, or Appendix G for certification tests completed on or after December 22, 1988.

5. Paragraphs (b) and (c) of Section 36.501 have been amended to direct applicants for new, amended, and supplemental type certificates to the appropriate noise certification regulation. The amendment establishes December 22, 1988, as the date on or after which all noise certification tests for propeller-driven small airplanes and propeller-driven, commuter category airplanes will be conducted using the methods and procedures of Appendix G. All tests completed before this date will use Appendix F. The noise levels appropriate to each procedure are contained in the applicable appendix.

6. The title of Appendix F has been changed to clearly indicate that it only pertains to the flyover test requirements for propeller-driven small airplanes and propeller-driven, commuter category airplanes.

7. Similarly, the description of the scope of Appendix F, contained in Section F36.1, has been amended to reflect its new status.

8. An Appendix G has been added to FAR Part 36 and its contents are summarized as follows:

Part A - General

The scope of Appendix G is specified in Section G36.1. The appendix prescribes procedures and certification noise levels applicable to tests of propeller-driven small airplanes and propeller-driven, commuter category airplanes which are conducted on or after December 22, 1988. Tests for propeller-driven small airplanes and propeller-driven, commuter category airplanes which are conducted prior to December 22, 1988, will be performed under Appendix F.

Part B - Noise Measurement

Section G36.101 specifies takeoff test conditions including both the physical conditions for the noise measurement site and the meteorological "test window". The meteorological window in which testing is allowable is larger for Appendix G than for Appendix F. Specifically, temperature and relative humidity limits for Appendix G have been increased to match those currently used for testing of large propeller-driven and turbojet powered aircraft. These new limits should decrease the need and costs of waiting for acceptable weather conditions before starting tests. The wind limits have been changed to include limits on both total wind and cross-wind velocity. Appendix F only has a total wind limit coupled with a requirement to align the airplane flight direction within +15 degrees of the wind under certain circumstances.

Section G36.103 describes the acoustical measurement system. Since the noise unit chosen for Appendix G is the same as that for Appendix F, no changes in this section have been made.

Section G36.105 is similar to the corresponding section of Appendix F, with some additional technical guidance provided. Specifically, two additional documents from the International Electrotechnical Commission (Publication No. 651, entitled "Sound Level Meters" and No. 561, entitled "Electro-acoustical Measuring Equipment for Aircraft Noise Certification") are incorporated by reference. A reference to the calibration procedures contained in Appendix A is also added to clarify the requirements in this area. The section adds two more categories of acceptable sound level recording instrumentation, graphic level recorders and sound level meters. These additions increase the flexibility of the rule and lower the costs to the applicant. Additionally, use of an inexpensive windscreen is required when the wind speed exceeds 5 knots. This requirement will improve the signal-to-noise ratio on windy days, improve the data, and increase the number of test days available to applicants.

Section G36.107 specifies the requirements for noise measurement procedures, including the orientation of the microphone during takeoff. The orientation of the microphone sensing elements during the test must be related to the direction from which the sound was coming during calibration. Similarly, the recorder must be calibrated within 10 decibels of the full-scale value. Both of these requirements are intended to ensure that differences between measurement systems will not affect measured sound levels.

Section G36.109 provides guidance on the types and extent of data necessary for noise certification including information on the equipment and its response, and meteorological and topography features that might affect noise measurements, aircraft performance, and noise levels. For takeoff noise tests, information must be gathered on aircraft performance and position

when the airplane is directly over the microphone to make the corrections required in Section G36.201.

Section G36.111 specifies airplane flight procedures with measurement distances taken from the microphone location at the noise measuring site. Specifically, the start of takeoff roll must be 8200 feet from the noise measuring site and the aircraft must pass over it within ten degrees from the vertical and within twenty percent of the reference (standard day) altitude. The reference day is a no-wind, sea level day at 59 degrees F and 70 percent relative humidity. The 59 degrees F standard is that used for calculating aircraft performance for airworthiness certification and by using this value, rather than the 77 degrees F used in Appendix F, applicants need not re-compute aircraft performance solely for noise certification purposes. Such calculations are not currently necessary under Appendix F since aircraft noise during level flyover can generally be assumed to be independent of temperature.

Part C - Data Corrections

Section G36.201 contains the technical specifications for the corrections to measured data necessary under Appendix G. Corrections are required to convert the data to standard reference conditions for (1) atmospheric absorption, (2) noise path length differences caused by conditions such as changes in altitude, (3) propeller tip speed, and (4) engine power. This section does not require correction for atmospheric absorption if the test is conducted within a "no-correction" window, shown in figure G1. A similar "no-correction" window is provided for certain tests conducted within five percent of the reference power.

Section G36.203 requires that the measurement point be overflown at least six times to get enough measurements for a statistically valid average sound level. Further, the variation of these flights must be such that the confidence limit does not exceed 1.5 dB(A).

Part D - Noise Limits

The noise level limits for the takeoff tests of propeller-driven small airplanes and propeller-driven, commuter category airplanes are contained in Section G36.301. The noise level must not exceed 73 dB(A) up to and including aircraft weights of 1,320 pounds. Between 1,320 pounds and 3,300 pounds, the noise limit increases linearly at a rate of 1 dB(A) for each 165 pounds from 73 dB(A) to 85 dB(A). Between 3,300 pounds and 19,000 pounds, noise cannot exceed 85 dB(A). The maximum weight of the airplane at brake-release must be the maximum weight for which noise certification is requested.

These limits (and all of Appendix G) apply to tests conducted on or after December 22, 1988, for noise certification for a new, amended, or supplemental type certificate. The choice

of a single date on which to apply Appendix G, is intended to provide for the smooth transition to the new test procedures and to ensure equitable treatment for all applicants.

Regulatory Impact Evaluation

The FAA conducted a detailed regulatory evaluation which is included in the regulatory docket. This evaluation reviews all changes to Parts 21 and 36. The FAA determined that the final rule is considered to be significant as defined in Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979) and is not major as defined in Executive Order 12291.

Little or no increase in costs will result from the proposed changes in certification procedures. Such costs, when they occur, could result from limits on future versions of existing aircraft types where those affected aircraft types demonstrate poorer-than-average climb capabilities during takeoff.

Regulatory Flexibility Determination

As detailed in the evaluation, the amendments adopted to Part 36 will not impose any new requirements on small or large entities. In fact, several amendments will reduce regulatory burdens to owners of certain airplanes (e.g., antique airplanes). The majority of changes to Part 36 are either editorial or clarifying in nature. Stringency is neither increased nor decreased. Since no substantial costs are incurred with adoption of the new amendments, it is certified under the criteria of the Regulatory Flexibility Act, the final rule will not have a significant economic impact on a substantial number of small entities.

Environmental Analysis

Pursuant to Department of Transportation "Policies and Procedures for Considering Environmental Impacts" (FAA Order 1050.1D), the FAA has determined that this rule will not constitute a major Federal action significantly affecting the quality of the human environment. The amendment will have no net effect on noise levels around airports, including those used exclusively for general aviation. Therefore, no environmental assessment or environmental impact statement is necessary.

Trade Impact Analysis

Little or no impact on U.S. or foreign trade will occur as a result of this amendment. The majority of changes to Part 36 are either editorial or clarifying in nature, and stringency is neither increased nor decreased. Absent the rule, U.S. propeller-driven small aircraft and propeller-driven, commuter category aircraft exports may be placed at a competitive cost disadvantage since each model would be required to be certificated to both the current Appendix F flyover test and the

ICAO takeoff test. The cost of multiple certifications would result in either higher selling prices or lower profits to U.S. manufacturers.

Federalism Implications

The regulations adopted in this final rule will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Thus, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Discussion of Comments

Interested persons were afforded the opportunity to participate in development of this rulemaking by submitting written comments to the public regulatory docket on or before October 9, 1986. All comments received have been reviewed and duly considered in promulgating this amendment.

Nineteen public comments were received in response to the notice (Docket No. 25034). All of the comments supported the revision of noise standards for propeller-driven small airplanes by substituting the use of actual takeoff tests for the level flyover tests specified in Appendix F; however, each commenter also has specific suggestions about one or more of the FAA's proposed amendments.

The comments received in public Docket No. 25034 were grouped by broad categories of issues and are discussed below.

Microphone Placement

A number of commenters recommended that a ground plane microphone be used for the measurement program instead of a microphone situated four feet above ground level. The ground plane microphone was recommended for greater accuracy of measurements and for standardization with ICAO measurement procedures. One commenter suggested that some recognition, in this rule, of measurements taken concurrently with both the ground plane microphone and the four foot high microphone is necessary in order to ensure that the FAA's verification of ground plane microphone measurements will be accepted by foreign certification authorities.

After consideration of the ground plane microphone, the FAA has chosen to continue using the four foot high microphone location for several reasons. First, the four foot microphone height measures noise where people receive it. Second, since noise measurements to date have been taken using a four foot microphone height, establishing a noise limit based on ground plane microphone measurements would require the FAA to first

obtain additional data using the ground plane microphone in order to establish a reference database. Third, the class of airplanes to which this rule applies often use airports where jets and other large aircraft also fly. The noise from those other aircraft is measured at four feet above ground level. Thus, there would be no way to compare the certificated noise levels of different aircraft using the same airport.

To lessen the burden on U.S. manufacturers which export aircraft, the FAA will approve, upon request, supplemental measurements obtained using the ground plane microphone. Although approved by the FAA, this supplemental information will not be considered a certification unless it is approved by the civil aviation authority of the country of import.

Aircraft Weight

Several commenters recommended that the upper weight limit of aircraft tested under this rule be increased to comply with the ICAO standard and to be consistent with NPRM, Notice 83-17 (48 FR 52010; November 15, 1983) which contained requirements for an additional category of propeller-driven, multiengine airplane, designated as the Commuter Category. The Commuter Category applies to airplanes with a maximum seating capacity, excluding pilot seats, of 19 or less, and a maximum certificated weight of 19,000 pounds or less. The final rule for the Commuter Category airplane was adopted on January 15, 1987 (52 FR 1806). NPRM, Notice 86-10 (51 FR 25500; July 14, 1986) was published for comment before the Commuter Category final rule was adopted and only covered certification of propeller-driven small airplanes of weights up to and including 12,500 pounds. To include Commuter Category airplane noise certification in Appendix G of Part 36, the upper weight limit for testing under Appendix G has been increased to 19,000 pounds.

Meteorological Conditions

Several commenters were concerned with the meteorological conditions and measurement procedures necessary for compliance with Appendix G. One commenter questioned the need to apply a restriction on tests where the atmospheric absorption at 8 KHz is greater than 12 dB/100 meters since the propeller blade passing or engine firing frequencies and their harmonics rarely produce energy above 1 KHz. Another commenter recommended locating the thermometer to measure ambient temperature and the hygrometer to measure relative humidity at 4 feet above the ground to avoid the need for remote monitoring. The NPRM proposed that meteorological measurements be made between 10 feet and 33 feet of the surface. Several commenters recommended that the no-correction window for atmospheric absorption be changed to comply with the ICAO standard. The NPRM proposed a requirement for atmospheric absorption correction for noise data obtained when the temperature is outside the range of 50 to 95 degrees F (10 to 35 degrees C) and/or when the relative humidity is outside

the range of 45 to 95 percent. One commenter suggested that testing with a temperature inversion should be permitted if a layered atmosphere with appropriate temperature and relative humidity measurements is used.

After consideration of the technical issues involved, the FAA has determined that the rule should not include a restriction on test conditions based on the atmospheric absorption at 8 KHz. By eliminating this restriction, the temperature/relative humidity window required for testing is now the same as the ICAO window, i.e., the ambient air temperature must be between 36 and 95 degrees F (2.2 and 35 degrees C) and relative humidity must be between 20 percent and 95 percent.

Further, for test simplification, the rule allows temperature and relative humidity measurements to be made with the thermometer and hygrometer situated between 4 feet and 33 feet of the surface instead of the NPRM measurement height of between 10 feet and 33 feet.

The no-correction window for atmospheric absorption has been modified to comply with the ICAO standard. Figure G1 contains the no-correction window for atmospheric absorption.

The correction to account for differences between the test and reference height of the airplane over the noise measuring point has been changed to that used by ICAO. The NPRM specified the correction Delta (1) = 22 log (HT/HR), where HT is the height of the test aircraft when directly over the noise measurement point and HR is the reference height. The final rule requires the correction Delta (1) = 20 log (HT/HR) be used when test day conditions are outside of those specified in the atmospheric absorption no correction window (Figure G1). Delta (1) = 22 log (HT/HR) will only be used when test day conditions are within those specified in figure G1.

Finally, it should be noted that Section G36.101 is not intended to preclude using a layered atmosphere to correct for a temperature inversion, provided the correction procedure is approved by the FAA. The rule allows as much flexibility as possible with regard to meteorological conditions. Thus, no provision was made to require that a layered atmosphere be used when testing with a temperature inversion if the inversion would not significantly alter the measured noise level of the airplane.

Rule Effective Date

Several comments were received regarding the effective date of the rule. Appendix G prescribes procedures and noise levels applicable to noise certification of propeller-driven small airplanes and propeller-driven, commuter category airplanes conducted on after December 22, 1988. The comments recommended that the date of applicability for the rule be based upon the date of application for the type certificate rather than on when the airplane is tested. In addition, two comments recommended

that a time period be established during which a manufacturer who fails to meet the new standard may revert to the existing standard to protect his investment. One comment stated that it was possible for an airplane to satisfy Appendix F, the existing noise certification standard, but be rendered non-compliant under Appendix G.

While recognizing the commenters' concerns about meeting Appendix G certification requirements, the intent of the FAA is to standardize the takeoff noise tests for all propeller-driven small airplanes and propeller-driven, commuter category airplanes. The criteria of Appendix G are designed so that airplanes which meet Appendix F certification requirements should also meet Appendix G requirements. Thus, the final rule requires certification to Appendix G for airplanes tested on or after December 22, 1988.

Acoustical Change

One comment stated that the FAA proposal to remove limitations on the definition of acoustical change for propeller-driven small airplanes and align this definition with that used by all other airplanes may impose an unnecessary burden on the manufacturers of this class of airplane. The comment went on to say that the definition of acoustical change currently in Section 21.93 has considerable utility because it effectively excludes the need to retest airplanes for minor configuration changes that experience has shown do not increase (or decrease) the measured noise levels.

Section 21.93 of the FAR currently limits the definition of acoustical change for propeller-driven, commuter category airplanes and propeller-driven small airplanes in the normal, utility, acrobatic, transports, and restricted categories to the following type design changes:

(1) Any change to or removal of a muffler or other component designed for noise control.

(2) Any change to, or installation of, a powerplant or propeller that increases maximum continuous power or thrust at sea level, or increases the propeller tip speed at that power or thrust, over that previously approved for the airplane.

The new rule defines an acoustical change as any voluntary change in the type design of an airplane that may increase the noise levels of that airplane. The FAA agrees with the intent of the comment to avoid retesting for minor configuration changes which are known no to increase the noise level and believes that the new wording more clearly meets that intent. This rule will not require testing for changes which, by past experience, have been shown not to increase noise.

Sound Recording

Two comments were received concerning the use of a sound level meter to record test data. Section G36.105 allows airplane noise to be recorded using a magnetic tape recorder, graphic level recorder, or sound level meter when approved by the regional certification authority. One commenter stated that the requirement in Section G36.105(a) that the test data should be recorded allowing a graphic level recorder or sound level meter to be used instead of a magnetic tape recorder is inconsistent with the rest of the section. Another comment, addressing the same section, questioned why a sound level meter is acceptable if the sound must be recorded. The comment went onto say that the reading of a sound level meter may be recorded, but this does not constitute recording the noise.

Appendix G is written with the intent of allowing the greatest amount of flexibility possible in order to avoid imposing undue economic burden on any applicant. Allowing the option to use a graphic level recorder or sound level meter is done to permit certification to be accomplished as inexpensively as possible. Thus, when approved by the regional certification authority, a sound level meter, graphic level recorder, or magnetic tape recorder is acceptable for recording airplane noise.

A further clarification has been added to Section G36.105 concerning the type of sound level meter to be used. The intent of the rule is to use Type 1 sound level meters, as specified in Appendix F (IEC publication 179). The NPRM specified that sound level meters must comply with International Electrotechnical Commission (IEC) Publication No. 651, entitled "Sound Level Meters." Publication No. 651 supersedes Publications 123 (1961), 179 (1965 and 1973), and 179A (1973). Although Publication 651 contains standards for Type 0, 1, 2, and 3 sound level meters, it does not specify the type of sound level meter to be used for noise measurement. To correct this ambiguity, Section G36.105 has been revised to specify the use of Type 1 sound level meters for Appendix G noise certification.

Limiting Noise Value

One commenter recommended that the FAA adopt the aircraft noise limits established by ICAO for noise certification of propeller driven small airplanes.

The aircraft noise limits specified in the FAA rule are as follows. The noise level must not exceed 73 dB(A) up to and including aircraft weights of 1,320 pounds (600 kg). For weights greater than 1,320 pounds, the limit increases at the rate of 1 dB/165 pounds (1 dB/75 kg) up to 85 dB(A) at 3,300 pounds (1,500 kg), after which it remains at 85 dB(A) up to and including 19,000 pounds (8,640 kg).

ICAO specifies a 76 dB(A) limit up to an airplane mass of 600 kg, then increasing with the logarithm of airplane mass at the rate of 9.83 dB(A) per doubling of mass until 88 dB(A) is

reached, after which the limit is constant up to 9000 kg. Thus, the difference in noise limits between the FAA rule and ICAO rule is approximately 3 dB(A) throughout the range of weight values for which the rule applies.

The higher ICAO noise limits can be attributed to their use of a ground plane microphone instead of the four foot height installation. Generally, a ground plane microphone will provide a noise level several dB(A) greater than a microphone situated four feet above ground level for the same airplane. Thus, the difference in limiting noise values between the FAA rule and the ICAO rule is due to a difference in measurement technique rather than a difference in noise standards.

Helical Tip Mach Number Correction

One commenter recommended that, in Section G36.201(d)(3), the phrase "no correction is to be made when Mt is larger than M_T should be deleted since it might be interpreted to apply to all cases, even those for which a specific value of the constant "k" has been determined. The constant "k" is equal to the slope of the line obtained for measured values of noise level in dB(A) versus helical tip Mach number.

The FAA agrees that if a specific value of k has been determined, a correction should be allowed when the test helical tip Mach number, M_T, is larger than the reference helical tip Mach number, Mr. The NPRM phrase "no correction is to be made when M_T is larger than M_R" was meant to apply only to cases where the nominal value of k is to be used for the correction. To avoid confusion over this point, Section G36.201(d)(3) has been revised as follows. The phrase "no correction is to be made when M_T is larger than M_R" has been deleted. The sentence "No correction may be made using the nominal value of k when M_T is larger than M_R has been added.

Noise Level vs Airplane Weight Graph

One commenter suggested including a figure showing graphically the noise level limits as a function of airplane weight. The FAA agrees that the addition of a figure showing noise limits as a function of airplane weight would simplify interpretation of the rule. Thus, figure G2 has been added to Section G36.301.

Microphone Diameter

One commenter recommended that since the ICAO test procedure specifies that a one half inch diameter microphone be used for data measurement, a one half inch microphone diameter should be specified for the FAA rule in order to achieve better international acceptance of data measured in accordance with the FAA procedure (and of data measured using the ground plane microphone). The NPRM did not specify a microphone size required for data measurement.

The FAA does not find it necessary to specify microphone diameter for noise certification testing in accordance with Appendix G. Both ICAO and the FAA require the same microphone frequency response tolerance. Therefore, the data should be accepted internationally. The one half inch diameter microphone is required for the ground plane microphone installation and thus is only an issue when the ground plane microphone is used.

Altitude Tolerance

One commenter recommended that the FAA consider eliminating the requirement that the aircraft pass over the measurement point within 20 percent of the reference altitude. The commenter stated that this requirement is unnecessary since Section G36.201 requires a correction to the noise level if the test altitude differs from the reference altitude.

After consideration of this comment, the FAA chose to retain the requirement that the aircraft pass over the measurement point within 20 percent of the reference altitude. This requirement is necessary due to the inaccuracy of the correction for deviations from the reference altitude and for consistency with the ICAO standard.

Test Flight Tolerances

In keeping with the general recommendation of most of the commenters that the FAA maintain standardization with the ICAO noise certification rule and to simplify the certification test flight procedure, the FAA has included a tolerance on the flight test speed and weight. As written, the language in the NPRM would have required each test flight to be conducted at a single precise airspeed and weight. The FAA notes that all other Part 36 flight test procedures include reasonable tolerances for the specified reference test conditions. Further, the FAA believes that such tolerances are necessary to account for pilot and meteorological variability from test to test, and for the weight of fuel burned during testing. Accordingly, the ICAO Annex 16 test tolerances have been added to Section G36.111(a).

Adoption of the Amendments

Accordingly, Parts 21 and 36 of the Federal Aviation Regulations (14 CFR Parts 21 and 36) are amended effective December 22, 1988.

The authority citation for Part 21 continues to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 1857F-10, 4321 et seq.; E.011514; 49 U.S.C. 106(g)(Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-64

Responsibilities of Manufacturers of Parts and Products Produced Under a Production Certificate

Adopted: November 28, 1988 Effective: January 3, 1989

(Published in 53 FR 48520, December 1, 1988)

SUMMARY: This amendment clarifies the responsibility of a production certificate holder with respect to the manufacture of a replacement or modification part for installation on a type certificated product. The amendment is intended to ensure that such manufacturers are aware of their responsibility to determine that each part produced conforms to its approved design and is in a condition for safe operation.

FOR FURTHER INFORMATION CONTACT: Melanie R. Miller, Aircraft Manufacturing Division, (AIR-200), Aircraft Certification Service, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591, telephone (202) 267-8361.

ADDRESSES: Comments may be mailed or delivered in duplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket (AGC-10), Docket No. 25745, 800 Independence Avenue, S.W., Washington, D.C. 20591. Comments may be examined in the Rules Docket weekdays, except Federal holidays, between 8:30 a.m. and 5 p.m.

SUPPLEMENTARY INFORMATION

Comments Invited

Even though this action is in the form of a final rule which involves clarification of an existing rule and was not preceded by notice and public comment procedure, comments are invited on the rule change. Interested persons are invited to comment on any portion of this rule by submitting written data, views, or arguments as they may desire. When the comment period ends, the FAA will use the comments submitted, together with other available information, to review the regulations. After the review, if the FAA finds that changes are appropriate, it will initiate rulemaking proceedings to amend the regulations. Comments that provide the factual basis supporting the view and suggestions presented are particularly helpful in evaluating the effects of the rule. Anyone wishing the FAA to acknowledge receipt of their comments submitted in response to this final rule must submit with those comments a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 25745." The postcard will be date/time stamped and returned to the commenter. All comments submitted will be available, both before and after the closing date for comments,

in the Rules Docket for examination by interested persons. A report summarizing each substantive public contact with FAA personnel concerned with this rulemaking will be filed in the docket.

Background

Section 21.303 of the Federal Aviation Regulations (FAR) specifies that no person may manufacture a replacement or modification part for sale for installation on a type certificated product unless it was produced by an owner or operator for use on his own product, or was produced under a Parts Manufacturer Approval (PMA), a type certificate or production certificate, or a Technical Standard Order (TSO). The requirement that these parts be produced under an FAA-approved quality control system helps ensure that installation of replacement or modification parts on type certificated products does not adversely affect the airworthiness of the product. In addition, with respect to parts produced under a PMA, Section 21.303(k) specifically requires that the manufacturer determine that each completed part conforms to the design data and is in a condition for safe operation. With respect to parts produced under a production certificate, however, Section 21.165(b) provides that the manufacturer must determine that each completed product conforms to the type design and is in a condition for safe operation.

Discussion

The FAA has historically regarded the requirement of a determination of conformity and condition for safe operation as applicable to all parts produced for installation on a type certificated product, including those manufactured under a production certificate, even though the word "parts" does not appear in Section 21.165(b). However, it has come to the attention of the FAA that recently there has been some confusion as to the applicability of the requirement to parts produced under a production certificate. Compliance with this requirement by all parts manufacturers is essential to aviation safety and, therefore, the FAA is amending the rule to clearly establish that a manufacturer under a production certificate is also required to ensure conformity and condition for safe operation of each part.

Good Cause Justification for Making this Amendment Effective Without Prior Public Comment

Since this amendment merely clarifies an existing standard and imposes no additional burden on any person, I find that notice and public procedures are unnecessary and would not reasonably be expected to result in the receipt of beneficial information. However, interested persons are invited to submit such comments as they may desire regarding this amendment.

Conclusion

The adoption of this amendment serves to clarify currently existing responsibilities of manufacturers of parts and products under production certificates. The amendment imposes no additional burden on any party. Therefore, the FAA has determined that this amendment is not a major rule under Executive Order 12291 or a significant rule under the Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). In addition, it is certified that under the criteria of the Regulatory Flexibility Act, this rule will not have a significant impact, positive or negative, on a substantial number of small entities, and the rule does not warrant preparation of a regulatory evaluation as the overall impact on manufacturers will be minimal.

Federalism Determination

The amendment set forth herein would not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. The amendment set forth would be promulgated pursuant to the authority in the Federal Aviation Act of 1958, as amended (49 U.S.C. 1301, et seq.), which has been construed to preempt state law regulating the same subject. Therefore, in accordance with Executive Order 12612, it is determined that such a regulation does not have federalism implications warranting the preparation of a Federalism Assessment.

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends Part 21 of the Federal Aviation Regulations (14 CFR Part 21) effective January 3, 1989.

The authority citation for Part 21 continues to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2); 42 U.S.C. 1857f-10, 4321 et seq., E.O. 11514; 49 U.S.C. 106(g) (Revised, Pub. L. 97-449, January 12, 1983).

Amendment 21-65

Location of Passenger Emergency Exits in Transport Category Airplanes

Adopted: June 16, 1989 Effective: July 24, 1989

(Published in 54 FR 26688, June 23, 1989)

SUMMARY: This final rule establishes a new standard that limits the distance between emergency exits on transport category

airplanes. This rule prohibits airplane manufacturers and air carriers from increasing the distance between emergency exits to more than 60 feet. Existing regulations do not limit the distance. This rule is intended to ensure an opportunity for safe passenger evacuation during an emergency.

FOR FURTHER INFORMATION CONTACT:

Arthur J. Hayes, Aircraft Engineering Division (AIR-200), Aircraft Certification Service, Federal Aviation Administration, 800 Independence Avenue, S.W., Washington, D.C. 20591; telephone (202) 267-9937.

SUPPLEMENTARY INFORMATION:

Background

Since 1967, the Federal Aviation Administration (FAA) has regulated the location of emergency exits on airplanes by requiring that an exit be provided for every specified number of passengers, that an exit be located where it would allow the most effective means of passenger evacuation, and that exits be distributed as uniformly as practicable taking into account passenger distribution. (14 CFR 25.807) An underlying assumption has been that a uniform distribution of exits accounting for passenger distribution results in reasonable seat-to-exit and exit-to-exit distances.

However, some recent exit configurations have exit distances that are greater than those envisaged when the exit rule was adopted. Of the new wide-body transports that were being designed when the rule was adopted, the Boeing Model 747 had a maximum distance between exits of 44 feet; the McDonnell Douglas Model DC-10, 47 feet; and the Lockheed Model L-1011, 50 feet. (All figures are rounded off.) Basic narrow-body transport models typically had shorter distances. Derivative configurations of these models show an increase in typical distances. Exit-to-exit distance, originally 50 feet in the L-1011-385-1, increased to nearly 70 feet in a later model, the L-1011-385-3. The Boeing 747 showed an increase from 44 feet in the 747-100, -200, and -300 models to nearly 70 feet in the 747-200 and 747-300 models with the No. 3 exits deactivated. A recent certification request proposed a derivative configuration with a distance substantially greater than 80 feet. The FAA denied this request. These recent cases of exit configuration design indicate that the exit distribution requirement of Section 25.807(c) alone is ineffective in preventing increases in escape path distances. While the agency recognizes that exit distance considered alone is not dispositive of the conditions which provide for a safe evacuation, under our current state of safety knowledge, this factor is clearly an important variable. As discussed below, however, the agency considers it preferable that a performance standard for evacuation be employed in the future, so as not to artificially constrain design options. With the specific intent of developing the information necessary to

propose such a performance standard to replace (among other factors affecting safe evacuation) this artificial exit distance limitation, the agency will gather the best available safety expertise in a formally chartered advisory committee to consider and report on the best means for achieving that end.

The agency's concern over the significance of escape path distance recently increased in connection with type certification activities for a derivative of the Boeing Model 747 (B-747), necessitating this action in the interim, until better knowledge permitting development of a performance standard becomes available. In September 1984, at the request of the Boeing Company (Boeing), the Seattle Aircraft Certification Office (ACO) approved a modification of the B-747 which would deactivate a pair of over-wing exits and reduce the maximum passenger capacity of the main deck by 110, from 550 to 440. The Seattle ACO approved the modification on the basis that such a modification was within the requirements of the regulations at that time. The FAA received many letters from the public objecting to the deactivation of emergency exits. In response to the public objections, the FAA Administrator asked the Office of Airworthiness (presently the Aircraft Certification Service) for a review of the ACO action. The review, dated March 1, 1985, found that the B-747, as modified, fully met all applicable rules and that no exemptions, waivers, or special conditions were granted or considered. Notwithstanding this conclusion, on June 12, 1985, the FAA Administrator wrote a letter to a number of U.S. air carriers strongly encouraging them to maintain the original number of emergency exits on their passenger-carrying Boeing 747 airplanes, because of safety concerns not addressed by the rule.

On June 24, 25, and 26, 1985, the House Subcommittee on Investigations and Oversight heard testimony from witnesses opposed to exit deactivations and from the FAA Administrator. The Administrator promised the committee a review of all issues raised in the letters received by the FAA and in testimony given before the committee. The review was summarized in a report to the Administrator, dated August 5, 1985. It found that the approval for design modifications to B-747 airplanes was technically valid in accordance with the regulations but that issues raised by the public added new emphasis and perspective to the issue of escape path distances. The report concluded that all of the issues raised by the public questioned the efficacy of the rules rather than the validity of the approval. The report stated that the FAA would hold a Public Technical Conference on emergency evacuation. As a result, an Emergency Evacuation Task Force was formed in Seattle, Washington, in September of 1985. The task force consisted of members of the interested public and was chaired by the FAA. The task force reviewed recent design, maintenance, and operational experience of the new generation of narrow- and wide-body transports. It examined the full range of emergency evacuation topics, including passenger emergency exits, cabin configuration, emergency evacuation demonstrations, evacuation slides, crewmember duties and training, and passenger

safety information. Although no consensus was reached by the task force, the task force efforts were helpful to the FAA in its own ongoing efforts to improve emergency evacuations. Unfortunately, the task force did not provide any basis for a performance standard to address the concerns raised by increasing exit distances.

The FAA reviewed the issues surrounding the Boeing approval as well as information gained on modifications of other wide-body transport airplanes, information received from flight attendants who are knowledgeable about emergency evacuation procedures, and information from the public and other interested persons. As a result, the FAA decided that the rules on number and location of passenger emergency exits were not adequate to maintain the original intent of those rules that exits be located to provide an opportunity for passenger evacuation in an emergency, because aircraft designs had significantly changed in the over 20 years since the rule was written.

The agency's reassessment of the rules in light of recent aircraft designs and events has confirmed the importance of the distance between exits and the potential impact of excessive distance on the chances of passenger survival in an emergency. Accordingly, in the absence of a performance standard which provides acceptable safety, the FAA is amending Parts 21, 25, and 121 of the Federal Aviation Regulations (FAR) to prohibit any passenger emergency exit from being located more than 60 feet from any adjacent passenger emergency exit. The FAA has determined that the specification of the distance between exits along with the existing uniform distribution rule is sufficient to provide the appropriate distance between a passenger seat and an emergency exit, though the preferable alternative would be a performance standard. For the purposes of this rule, the distance between exits is measured along a line parallel to the airplane's longitudinal axis for exits on the same deck and on the same side of the fuselage.

This rulemaking action covers only one of many factors affecting cabin evacuation. The FAA considers evacuation within a systems or "holistic" framework, i.e., a number of interrelated factors affect the success of an evacuation. These factors include: cabin attendant training, fuselage attitude, door design, door reliability, chute design and reliability, chute inflation times, aisle design, seat materials, exit row lighting, aisle lighting, crew check lists, passenger safety information, cabin configuration, and other factors.

The FAA is addressing these and other related issues by establishing an emergency evacuation advisory committee to develop recommendations for an evacuation performance standard and appropriate further modifications and additions to the agency's existing evacuation regulations. The committee will include representatives of crewmembers, airlines, manufacturers, and other interested organizations. The committee will provide the FAA with recommendations on areas which concern improved

specification of emergency evacuation regulations and other new techniques which should enhance cabin evacuation. Specifically, the committee will be tasked to design a performance standard against which safe evacuation capability of existing and new aircraft designs can be measured in order to replace artificial exit distance limitations and other nonperformance oriented design criteria mandated by this and other regulations. This group will be asked to submit recommendations on airplane evacuation standards by July 1, 1991, and to review all relevant cabin evacuation issues that the FAA asks it to consider, as well as issues raised by passengers, the National Transportation Safety Board, and the Congress. The FAA will use the committee's recommendations as a basis for reformulating the agency's evacuation regulations, if warranted by analysis in accordance with Executive Order 12291. While such a reformulation into an evacuation performance standard is hoped to obviate the need for distance limitations established by this final rule, the FAA finds that, in the interim until such performance standards are available, distance limits between emergency exit doors are necessary in the interest of airline passenger safety.

On October 20, 1987, the FAA published Notice of Proposed Rulemaking No. 87-10 (Notice No. 87-10)¢52 FR 39190| which proposed to establish new standard limits on transport category airplanes for the distance between any passenger seat and the nearest emergency exit and the distance between exits. On March 2, 1988, the Administrator testified before the House Committee on Public Works and Transportation, Subcommittee on Investigations and Oversight. In that testimony the Administrator stated that, having reviewed the public comments, the FAA planned to issue a final rule to prescribe a new standard to limit the distance between exits. Comments received on the proposals are described and responded to below.

Discussion of Comments

The FAA received 31 comments on the proposals. Approximately two-thirds of the comments are generally supportive of the FAA proposals. These supportive comments are from associations of airline employees, from individual flight attendants and private citizens, and from an association of airline passengers. In addition to these groups, there are favorable comments from the National Transportation Safety Board (NTSB), The Airworthiness Authorities Steering Committee, Transport Canada, and The Civil Aviation Administration of China.

Although about one-third of the commenters oppose the proposals, none of these comments contains either a supportable alternative performance standard or any additional proof that would convince the FAA that the proposals should be withdrawn. These opposing comments come from foreign air carriers, from airline associations, and from airplane manufacturers.

The discussion of comments is divided into the following categories of issues: (1) common sense support of the agency's

approach; (2) retroactive nature of the agency's action; (3) claimed discriminatory and inconsistent nature of the agency's action; (4) offsetting factors; (5) accident and service experience; (6) actual emergency evacuation conditions versus evacuation demonstrations; (7) sixty-foot determination; (8) economic costs; and (9) comments beyond the scope of the proposals.

Common Sense Support of the Agency's Approach

Most of the supporting commenters agree that, given our present state of knowledge regarding safety matters, exit-to-exit distances affect the outcome of emergency evacuations. Throughout the favorable comments, the common sense assumption is presented that a passenger who is close to an emergency exit has a better chance to escape than a person farther away. A British aeronautical engineer states:

> With the considerable test and operational data available to the FAA it is reassuring to read that they now also support my long held opinion, and that of my colleagues, that the escape path distance can have a major effect on the outcome of the evacuation.

The commenters who support the proposals think that the FAA should address the issues of exit-to-exit distance and seat-to-exit distance as well as other cabin improvements (e.g., smoke hoods and location of cabin attendant stations).

The FAA agrees that distance from a passenger to an exit and distance between exits are relevant factors (though not the only important ones) in emergency evacuations and, therefore, is amending its airworthiness requirements to establish a standard limit on distances between exits, in the absence of a preferable performance standard. For reasons discussed under the heading Rule Clarifications, the FAA is not adopting a specific limit on the distance between a passenger seat and the nearest emergency exit. In recent years, the FAA has completed several rulemaking actions that addressed other safety features that could increase the likelihood of passenger survival in an emergency evacuation. On July 10, 1986, the FAA issued Amendments 25-61 and 121-189 (51 FR 26206) to upgrade fire safety standards for cabin interior materials in transport category airplanes. On May 29, 1987, the FAA issued Amendment 121-194 (52 FR 21472) to establish new carry-on baggage requirements. The Task Force Report on Emergency Evacuation of Transport Airplanes (discussed in the background section of the preamble of Notice No. 87-10) identified additional areas that are under study within the FAA and that could be the subject of future rulemaking. The agency expects that the emergency evacuation advisory committee to be formed will consider all of these data in its development of a recommended performance standard for emergency evacuations.

Retroactive Nature of the Agency's Action

Several commenters state that the FAA is attempting by general rulemaking to disapprove, retroactively, a particular emergency exit design that the FAA admits is legal under existing regulations. Specifically, The Boeing Company describes three ways that this rule would be applied retroactively.

(1) It would apply to applications for supplemental type certificates (STC) or for amendments to type certificates that were submitted to the FAA before October 16, 1987 (Section 25.2).

(2) It would apply to airplanes that already have STC's or amended type certificates but have not yet received standard airworthiness certificates (Section 21.183(f)).

(3) It would prevent airplanes that are already in service from being modified in a way that was legal under the certification rules that applied to those airplanes when they were manufactured (Section 121.310(m)).

Only one commenter specifically criticizes the agency's intention to make Section 21.183(f) and 121.310(m) applicable as of the date of issuance of the proposals.

Boeing states that the FAA does not have discretion to change the rules in the ways described above. Boeing also states that once the FAA has approved a type design and issued a production certificate the manufacturer is entitled under Section 21.183(a) to a standard airworthiness certificate without further showing. Boeing states that the FAA cannot change the automatic nature of Section 21.183(a) because it maintains that Section 21.183(a) is taken directly from the agency's statutory mandate. Section 603(c) of the Federal Aviation Act of 1958 (Act), 49 U.S.C. section 1423(c), provides:

> If the Administrator finds that the aircraft conforms to the type certificate therefor, and, after inspection, that the aircraft is in condition for safe operation, he shall issue an airworthiness certificate.

Boeing further states that Congress passed legislation giving the FAA specific authority to issue retroactive regulations relating to aircraft noise and sonic boom which shows that the FAA does not otherwise have the authority to issue retroactive regulations under the Act.

Boeing's description of how the new rule is applied retroactively is correct; however, Boeing and other commenters are incorrect in claiming that the FAA does not have any authority to apply airworthiness certification rules retroactively.

The basic scheme of the type certification regulations is set out in Section 21.17. Paragraph (a) of Section 21.17 reads

as follows:

(a) Except as provided in Section 23.2, Section 25.2 and in Part 36 of this chapter, an applicant for a type certificate must show that the aircraft, aircraft engine, or propeller concerned meets -

(1) The applicable requirements of this subchapter that are effective on the date of application for that certificate unless -

(i) Otherwise specified by the Administrator, or

(ii) Compliance with later effective amendments is elected or required under this section, and

(2) Any special conditions prescribed by the Administrator.

Section 21.17(a) has described for many years four methods by which an applicant for a type certificate could be required to comply with regulations that are not the applicable requirements that are effective on the date of application for the type certificate. First, retroactive regulations could be applicable under Section 25.2. Second, under Section 21.17(a)(1)(i), the applicable regulations could be otherwise specified by the Administrator. Third, under Section 21.17(a)(1)(ii), compliance with later effective regulations could be required. Fourth, under Section 21.17(a)(2), special conditions could be prescribed by the Administrator.

In addition, airplane manufacturers have always been affected by either special airworthiness requirements or instrument and equipment requirements that have been included in the applicable operating rules (e.g., Subparts J and K of Part 121). Even though an airplane fully met the type certification requirements, an airline could not operate the airplane unless it also met the special airworthiness or instrument and equipment requirements that apply to that airline.

Thus, for many years, the FAA has had the authority to upgrade applicable type certification and airworthiness requirements as needed to ensure that the appropriate level of safety is maintained. This authority to apply rules in a manner that has certain retroactive effects has been exercised by the FAA on many occasions and applies to supplemental type certificates and to amendments to type certificates. The language in Section 603(c) of the Act in no way limits the above described authority since the issuance of an airworthiness certificate becomes automatic only after the Administrator has found full compliance with the type certificate or production certificate, as applicable. (See Section 21.183)

Therefore, the fact that the FAA was given specific authority in Section 611 of the Act to issue retroactive rules

relating to aircraft noise and sonic boom does not lead to Boeing's conclusion. As described above, the authority to promulgate retroactive requirements to address safety issues is consistent with the proper exercise of the agency's safety rulemaking authority, and exists independently from the authority to promulgate standards to address the control and abatement of noise and sonic boom. Therefore, the enactment of Section 611 in no way diminishes the authority of the FAA under the Act to adopt the standard described herein.

Claimed Discriminatory and Inconsistent Nature of the Agency's Action

Boeing states that the proposed Part 121 amendment is arbitrary and capricious and discriminates against Boeing because it is specifically targeted at the B-747. Boeing's basic argument is that if safety is the justification for the operating rule, then all airplanes that do not meet the 30-foot/60-foot requirements would have to be barred from future Part 121 operations. According to Boeing, however, Section 121.310(m), as proposed, would permit Lockheed Model L-1011-500 (L-1011-500) airplanes that are presently operating under Part 121 to continue to operate under that part even though they do not meet the 30-foot/60-foot requirements while prohibiting operation of comparably modified or newly-manufactured B-747 airplanes. Boeing and other commenters state that the FAA position is inconsistent in the following ways:

(1) A 10-door B-747 would be considered safe for 550 passengers on the main deck while an 8-door B-747 would not be considered safe for 440 passengers or even for substantially lower maximum seating configurations.

(2) L-1011-500 airplanes with emergency exits that are 65.6 feet apart would continue to be legal under Part 121.

(3) Foreign air carriers could continue to operate their previously-modified 8-door B-747's into and out of the United States but could not sell a modified B-747 to a Part 121 certificate holder unless the over-the-wing exits were reactivated.

The Lockheed Corporation (Lockheed) states that the regulatory evaluation prepared for the proposals is inconsistent with the proposed rule language because, while the regulatory evaluation states that the L-1011-500 airplanes would not be impacted by the proposed rule, the language of proposed Section 121.310(m) would prevent such airplanes now owned by foreign operators from being sold to U.S. airlines.

KLM Royal Dutch Airlines (KLM) suggests that because the agency's distinctions may not be understandable to the public, airlines like KLM might be forced to reactivate exits so that they would not have internal inconsistencies in their operations.

That airplanes will be flying side by side in air carrier

operations even though they neither meet the same requirements nor possess the same characteristics is in no way a new concept. At times the FAA has adopted retrofit rules that apply to all airplanes operating under a particular operating rule, and at other times it has allowed certain airplanes to continue operating until they are retired.

Under this rule there would continue to be inconsistencies in the seat-to-exit ratios of various airplane types. Under the current rules, airlines have chosen to configure their cabin space in various ways and many airplanes do not have as many seats as would be allowed for that airplane under Section 25.807; however, this rulemaking addresses exit-to-exit distance as a separate issue from seat-to-exit ratios. The current seat-to-exit ratios in Section 25.807 are not changed by this rulemaking. Perhaps the emergency evacuation advisory committee will develop recommendations for a performance standard which accommo**DATES** the changes implied by this comment.

The statement from the regulatory evaluation referenced in the Lockheed comment did not mean that L-1011-500 airplanes would be excluded from the effect of proposed Section 121.310(m). The statement referred to the fact that, since Lockheed is no longer manufacturing the L-1011-500, there would be no direct economic impact on Lockheed. Under new Section 121.310(m), no existing foreign-owned airplane (whether a L-1011-500 or a modified B-747 or any other transport category airplane) that exceeds the exit-to-exit limit can be obtained by a U.S. airline to be operated under Part 121.

This rule intended to "hold the line" on growth of exit distance until an adequate performance standard can be developed. The overall effect of this final rule is threefold:

(1) No operator of U.S.-registered airplanes can modify one of its existing airplanes to exceed the exit-to-exit limit established by this rulemaking under Part 121.

(2) No operator can purchase from a foreign air carrier and operate under Part 121 any existing airplane that exceeds the exit-to-exit limit established by this rulemaking.

(3) No airplane manufactured after October 16, 1987, that exceeds the exit-to-exit limit will receive a U.S. standard airworthiness certificate.

Thus, while this rule contains the above-mentioned effects, this rule does not require any operator of a U.S.-registered airplane to expend any resources to retrofit any airplane that was in its fleet as of October 16, 1987. These effects clearly are associated with no direct costs.

Offsetting Factors

Several commenters state that improvements to emergency exit slide design and maintenance and to emergency exit door maintenance and actual seating configurations are offsetting factors which would allow faster and safe evacuations with fewer exits. This, in fact, might be true and could be a factor to be considered by the emergency evacuation advisory committee in its attempts to develop a suitable performance standard.

Boeing cites specific emergency exit and slide design improvements for the B-747's in the following areas.

(1) Reduced inflation time of up to 50 percent;

(2) Use of higher strength, tear, and puncture-resistant sliding surface materials;

(3) Improved 25-knot wind performance;

(4) An escape slide design with improved load-bearing capacity; and

(5) Lengthening the No. 2 door escape slide so that it can be usable for a wider range of conditions.

Virtually all of the foreign air carriers state that the FAA failed to consider that the standard seating configuration for the main deck of their B-747's ranged from 322 passengers to 384 passengers, all well below the 440 that would be the maximum under the present rules for an 8-door configuration. British Airways suggests as an alternative to the FAA proposals a 10-percent reduction in the present limit of 440 passengers to 396 for the 8-door configuration.

While the FAA recognizes that there have been improvements in emergency evacuation equipment and maintenance in recent years, in the absence of an accepted and validated performance standard against which to measure these factors and their contribution to evacuation success, these improvements do not offset the need to place a limit on the distance between exits until the performance standard is developed. Furthermore, as one commenter notes, a large proportion of the world fleet is not yet fitted with the inflatable slides which incorporate the latest safety advances. Also, this commenter notes that, despite improvements in emergency evacuation procedures for wide-bodied transports, the time necessary to evacuate these types of airplanes in full-scale demonstrations remains close to the time necessary to evacuate narrow-bodied airplanes.

The FAA is not addressing seat-to-exit ratios in this rulemaking. As discussed previously, this rulemaking is needed to hold the line on maximum exit-to-exit distance to provide the appropriate level of safety until a performance standard can be developed. This requirement will work together with present seat-to-exit ratio requirements, uniform distribution requirements, and improvements in evacuation equipment to

increase the likelihood that passengers will survive in emergencies involving fire where evacuation is necessary.

Accident and Service Experience

Boeing and others point to actual evacuations in emergency situations in which 8-door B-747's were evacuated safely. British Airways describes its own experience in two emergency evacuations (Azores, 1985, and Los Angeles, 1987) where 334 and 370 passengers, respectively, plus crewmembers evacuated with only a few minor injuries to passengers.

The examples cited by commenters do not contradict the proposed rule changes. The main objective of the 60-foot exit-to-exit distance requirement is to prevent any further increase in exit-to-exit distances until an adequate performance standard can be developed.

While the evacuation situations described by British Airways are both examples of successful actual emergency evacuations, neither involved crash conditions. The evacuations involved neither fire nor smoke, and all emergency exits were operable. In accidents studied where some passengers survived and some did not, evidence indicates that proximity to an exit increased the likelihood of survival. (See the following discussion.)

Actual Emergency Evacuation Conditions Versus Evacuation Demonstrations

Positions vary on the question of whether distance to exits is as important as other factors in evacuation. The Association of Flight Attendants (AFA) states that distance to exits is as important as other factors. In support of its position, the AFA provides quotes from two earlier FAA reports. A 1964 report entitled "Human Factors of Emergency Evacuation" stated that no passenger should be more than 22 feet from an exit. (AM 65-7, p. 8, Mohler, Swearingen, McFadden, and Garner). A 1970 FAA report entitled "Survival In Emergency Escape From Passenger Aircraft," stated:

> In all three accidents, the distance between initial seat location and the nearest usable exit tended to be greater among fatalities than survivors. This leads to the not unsurprising conclusion that it is better to sit closer to an exit than farther away.

(AM-70-16, p. 55, Snow, Carroll, and Allgood)

The AFA also states that testimony of flight attendants who had been in crashes confirms that distance to exit doors is important in escaping.

Many commenters who think that the FAA is overemphasizing distance to exits appear to agree with one commenter who states that the time needed to evacuate airplanes in emergencies is a

function of both distance to the nearest emergency exit and the time to evacuate. This commenter suggests that with shorter distances, lines may form and that the piling up or queuing of passengers in emergency evacuations may actually impede the ability to evacuate airplanes because passengers could be more prone to panic if they are lined up and waiting.

Most of the opposing commenters also appear to believe that the FAA is not giving adequate recognition to the numerous emergency evacuation demonstrations that have proven that airplanes, such as models of the B-747 with 8 doors on the main deck, could be evacuated within less than 90 seconds with 50 percent of the exits blocked along with the other simulated emergency conditions required by the rules.

As noted in Notice No. 87-10, the evacuation demonstration required by Section 25.803 neither establishes a maximum escape path distance nor demonstrates that escape path distance is not a major factor in actual emergencies. That demonstration is conducted to provide a benchmark against which the FAA can consistently evaluate emergency exit performance with various internal seating and emergency exit configurations. It does not simulate actual post-crash emergency evacuation conditions, nor could it reasonably do so. It is not an acceptable evacuation performance standard.

As explained in Notice No. 87-10, with present designs, excessive escape path distance can be a major impediment to evacuation in a number of situations which service experience has shown might occur during an actual emergency. The typical passenger cabin with a single aisle feeds evacuees to pairs of exits, one exit on each side of the cabin (or dual aisles to dual lane exits in typical wide-body cabins). In an actual emergency evacuation, exits at one end of the cabin might be made unusable by fire, smoke, structural damage, water submersion, landing gear collapse, or other causes, leaving one or more pairs of usable exits in the remainder of the cabin. This is commonly the case in a pool fire accident, where escape time differences of only a few seconds can be critical. In this situation, the aisle cannot feed evacuees to a pair of typical floor level exits fast enough to use the full evacuation capability of the exit pair. The flow rate of the aisle is less than that of the exit pair, making the aisle itself the critical impediment which determines the time required for passengers to escape the airplane. Similarly, dual aisles inadequately feed pairs of exits equipped with dual-lane evacuation slides.

In the situation where one exit in a pair of exits is unusable, as in an evacuation demonstration, the aisle is not the critical impediment to evacuation. In this case the aisle can feed more evacuees to the remaining single exit than that exit can handle. This results in passenger queues at exits. The limited flow rate of the single exit is the impediment which determines evacuation time. This is the situation which some commenters contend demonstrates that aisle length has no effect

on evacuation time. The FAA acknowledges that in evacuation demonstrations, aisle distance may not be as critical a factor in evacuation time as it is in real accident emergencies where the aisle may be barely passable. The agency expects that these variables will be more appropriately accounted for in a performance standard developed by the emergency evacuation advisory committee.

Sixty-Foot Determination

A number of commenters address the proposed maximum distance between emergency exits. Several commenters who support the proposed maximum distance between exits cite the historical increase in distance between exits as described in Notice No. 87-10. These commenters agree with the FAA position that earlier improvements in crashworthiness safety regulations had not focused on the distance between exits because as a practical matter those distances were all within a range generally agreed to be acceptable. Some of these commenters suggest that while they think a distance of less than 60 feet could be justified, they will accept the agency's proposal of 60 feet.

Virtually all of the commenters who oppose the proposal state that there is no basis for the 60-foot maximum distance requirement. Typical of these commenters is KLM Royal Dutch Airlines' statement that the 60-foot limit between emergency exits was and is an arbitrary figure, not supported by objective evidence or analysis. KLM states that the 60-foot limit was a subjective opinion expressed by airline cabin crew delegations at the 1985 Evacuation Technical Conference in Seattle. KLM and other commenters urge the FAA to consider other factors besides exit distance: factors such as dual aisles versus single aisles and the number of people who have been evacuated within the 90-second limit in demonstrations of emergency evacuation procedures under Part 121.

Several commenters assume that the primary justification for the proposed 60-foot maximum distance is the tests discussed in Notice No. 87-10 that were conducted in the emergency evacuation simulator at the FAA Civil Aeromedical Institute (CAMI). These commenters specifically dispute the statement made in Notice No. 87-10 that the CAMI tests indicate that a reduction in aisle flow by about one-third could be reasonably expected when the floor is inclined because of, for example, gear collapse.

Boeing contends that the FAA selectively used the CAMI data. British Airways states that it disagrees with the conclusions drawn by the FAA on flow rates and has not been able to support it in its reading of the appropriate CAMI report.

As the discussion in Notice No. 87-10 clearly indicated, the justification for the maximum 60-foot distance between exits is not based on specific empirical research (CAMI's or other) success or failure of evacuation demonstrations, or anecdotal evidence from actual crash evacuations. However, testing,

historical data, analysis, and informed engineering judgment lead the FAA to conclude that, in the absence of a preferable but presently unavailable evacuation performance standard, it would not be prudent to allow distances between emergency exits to increase without providing a limit. As Notice No. 87-10 stated, the issue of maximum distance between exits was not addressed in the major crashworthiness regulations in the 1960's because even the new wide-bodied transports then being designed had a maximum exit-to-exit distance ranging from 44 feet to 50 feet. Before Notice No. 87-10 was issued, one designer of a derivative version of an existing airplane proposed exit-to-exit distances substantially exceeding 80 feet. This is not acceptable, for reason of safety, in present designs.

For the FAA to determine that 60 feet is the maximum allowable distance between exits, the FAA does not have to conclude, as Boeing and many other commenters seem to assume, that 65 feet or 75 feet or even 85 feet would never under any circumstance be safe. A survivable crash situation in which upwards of 400 people safely evacuate an airplane with exits more than 60 feet apart is certainly possible. But, as other commenters note, there also have been survivable crashes in which many people died or were injured because some or nearly all of the available exits were unusable. As the FAA has stated on numerous occasions, Part 25 of the FAR contains many requirements for built-in redundancy because it would be imprudent to allow otherwise. For instance, three-engine transport category airplanes must be capable of maintaining safe flight with two engines inoperable, not because such flight is desirable but because such capability may be necessary, although rarely, to avoid a catastrophe.

Therefore, the decision to establish a maximum distance of 60 feet between exits is not a decision based on specific provable data. Rather, in the absence of a technically acceptable evacuation performance standard, it is a decision based on a balancing of door distance in the total equation of cabin evacuation, that is, how door distance interrelates with aisle design, exit row lighting, door design, chute inflation time, and other factors that go into the cabin evacuation scenario, given our present understanding of the interrelationship of these variables. The FAA finds that the selection of a maximum 60-foot distance between exits is a prudent and necessary safety decision consistent with its mandate under the Act and in the absence of an acceptable performance standard.

The agency has placed in the public docket (No. 25419) an explanation of its analysis and use of the CAMI tests in arriving at the one-third reduction in flow rate mentioned in Notice No. 87-10. These tests were just one factor in the agency's decision. The primary technical basis for the difference between the one-third reduction and lesser figures mentioned by commenters is the emphasis given to different parameters in the tests.

Economic Costs

Many foreign air carriers and Boeing comment that the agency's regulatory evaluation did not consider potential revenue loss to air carriers because they could not increase their passenger capacity. These commenters state that with 8 emergency exits on the main deck, it would be possible to increase the seating capacity by 6 to 12 seats while maintaining an interior layout consistent with the current layout (a mix of first class, business class, and coach seating; seat pitch and width; and interior service areas such as closets, galleys and lavatories). Commenters provide a range of estimates of the annual value of these seats to air carriers in additional passenger revenues.

The loss of potential revenue because an air carrier cannot increase its passenger capacity should not be considered as an impact of this rulemaking. Airlines are currently operating B-747's well below the type certificated maximum seating capacities: 440 with 8 exits and 550 with 10 exits on the main deck. This rulemaking does not prohibit an airline from increasing passenger seating capacity to the maximum allowed. Although allowing deactivation of two of the exit doors could potentially provide air carriers with an opportunity to increase passenger seating capacity without changing the present interior layout, it is not a cost directly related to this rulemaking. It is a cost resulting from air carrier management decisions regarding cabin configuration and passenger service.

Only foreign air carriers and Boeing raised the issue of increasing passenger seating capacity. The Air Transport Association of America (ATA), which represents U.S. air carriers, states in its comments. "Few ATA member airlines are directly affected by the proposed limitations on seat-exit locations; those which are directly affected have, for reasons of their own, elected to restrict their future airplane seat/exit configurations to those which comply with the proposed limits." Consequently, this rulemaking does not have a substantial impact on U.S. air carriers.

The cost figures submitted regarding lost opportunity are inaccurate. For example, both Boeing and Korean Airlines assume that the present passenger load factor would apply to the additional seats gained by deactivation of the exit doors; however, if the current passenger load factor is about 70 percent on an airplane with 350 seats, the additional 6-12 seats would be used only when flights were full or nearly full. The additional seats would more accurately have a load factor of about 10 percent. Such an adjustment would significantly reduce the lost opportunity costs of the air carriers.

KLM Royal Dutch Airlines expresses concern that it would be forced to reactivate exit doors in its 8-door B-747's because the public may think the airplanes with 8 doors on the main deck are unsafe. KLM states that reactivating the doors would cost

$450,000 per airplane. The FAA is not requiring exit doors to be reactivated as a condition for continued airworthiness. As stated previously, the FAA is prohibiting air carriers and manufacturers from increasing exit-to-exit distances beyond the limitations in this rule because the preferable alternative of a performance standard cannot now be exercised. As a result of this rulemaking, airlines may voluntarily reactivate exit doors in the interest of safety. These costs would be voluntary and, therefore, are not being considered.

The Orient Airlines Association and Korean Airlines state that orders for 8-door B-747's have been placed with Boeing. In anticipation of delivery of these airplanes, the airlines have made plans; to change these plans, as the final rule would require, would involve incurring added costs. The FAA recognizes that inconvenience may be involved for foreign air carriers that had placed orders. However, any such lost opportunity costs are not considered except as they relate to U.S. trade (discussed in the International Trade Impact Assessment).

Boeing submitted cost estimates on fuel costs associated with additional weight and maintenance cost of the equipment for the two exits. These avoided costs were considered in the regulatory evaluation for the proposed rule. The estimated cost impact is $8,300 per B-747 per year operated. This consists of $6,800 in avoided fuel costs and $1,500 in avoided maintenance expenses. Boeing estimates an annual cost increase of $4,780 per B-747. This consists of fuel costs of $1,080 and maintenance costs of $3,700. In light of these figures, an appropriate range of the potential per airplane annual cost increase of this final rule is from $5,000 to $8,000.

In **SUMMARY**, no additional cost/benefit information, which significantly alters the agency's original assessment of the proposed rule, was submitted in response to Notice No. 87-10.

Comments Beyond the Scope of the Proposals

The following are a number of comments that while relating to the overall issue of emergency evacuation are beyond the scope of this rulemaking:

• One commenter recommends a separate proposal to resolve the shortcomings and controversial aspects of simulated emergency evacuation demonstrations.

• British Airways recommends further evacuation testing to establish supportable, repeatable criteria rather than the subjective opinions expressed in Notice No. 87-10.

• McDonnell Douglas states that the issue is more complex than just distance alone and that the FAA should consider seat pitch, aisle width, door size, and seat density.

• ALPA states that the FAA should correlate distance to size of exit. For example, for less than a Type A exit, the maximum distance between exits should be 50 feet.

• Several commenters suggest that a flight attendant be required at each Type A emergency exit.

As stated earlier, this rulemaking focuses on exit-to-exit distances because an acceptable performance standard has not yet been developed. The FAA may address related issues, such as emergency evacuation demonstrations, cabin configuration, and location of flight attendants in other actions and in the deliberations of the emergency evacuation advisory committee. The recommendation by British Airways to conduct further evacuation testing before establishing criteria would only allow for continuing increase in exit-to-exit distances. The FAA will continue to conduct research in emergency evacuations and will use such research results to increase the likelihood of passenger survival in emergencies. The FAA will also fully support and aggressively address the recommendations of the emergency evacuation advisory committee regarding proposal and adoption of a regulation implementing an evacuation performance standard.

Rule Clarifications

In addition to minor editorial corrections, the following specific changes have been made to the proposed rule language that appears in Notice No. 87-10.

Section 25.2

The phrase, "involving an increase in distance between any adjacent passenger emergency exits," in proposed Section 25.2(b) has been replaced with the words "for an airplane manufactured after October 16, 1987,". This change makes the language of Section 25.2 consistent with Section 21.183(f) and clarifies the intent that Section 25.2(b) applies only to newly manufactured airplanes.

Sections 25.807(c)(7) and 121.310(m)

One commenter notes that the distance from the furthest upper deck seat (down the staircase) to a main deck exit in the B-747 is greater than 30 feet. This commenter recommends that the distance to the exit on the upper deck should be allowed to meet the rule. Two other commenters emphasize that both distances (seat-to-exit and exit-to-exit) should be measured parallel to an airplane's longitudinal centerline axis.

The intent is for each distance to be measured along a line parallel to an airplane's longitudinal axis for exits on the same deck and on the same side of the fuselage. The wording in the rule has been changed to accommodate these concerns, to clarify that adjacent exits are on the same side of the same deck, and to set a limit on exit-to-exit distance only on the same side of the

same deck.

In addition, proposed Sections 25.807(c)(7) and 121.310(m)(1) have been withdrawn because they are redundant with respect to existing requirements. (Proposed Section 25.807(c)(8) has been renumbered Section 25.807(c)(7) in this final rule.) Section 25.807(c) currently requires that at least one floor level exit per side be located near each end of the cabin. Therefore, for a passenger seat located aft of the aft-most exit or forward of the forward-most exit, the escape path distance will not be excessive.

Regulatory Evaluation Summary

The regulatory evaluation prepared for this rule considers costs and benefits associated with amendments to Parts 21, 25, and 121 to limit passenger emergency escape path distance by establishing a standard that limits the distance any exit may be from an adjacent exit (no more than 60 feet).

The potential impact of this rule falls primarily on U.S. airline operators of B-747 airplanes. Although no B-747 airplane currently in use by U.S. air carriers has an exit-to-exit distance greater than 60 feet, a loss of potential revenues could occur if any U.S. air carrier intended to deactivate two exit doors from B-747 airplanes thereby increasing exit-to-exit distances beyond the standard limit established in this rulemaking.

This rule could have a potential impact on operators of Lockheed Model L-1011-385-3 (L-1011-500) airplanes. These airplanes are no longer in production and those currently in existence in U.S. air carrier service have been excluded from the requirements of this rulemaking. Noncomplying L-1011-500's may not enter Part 121 operations after October 16, 1987. The L-1011-500's owned by foreign operators before October 16, 1987, cannot be used by a Part 121 operator unless they are modified to comply with the exit distance requirements. To modify such an airplane is prohibitively expensive.

After reviewing the comments received on Notice No. 87-10, the FAA has revised its regulatory evaluation of this final rule. No U.S. air carrier indicated any interest in deactivating emergency exits on its existing B-747 airplanes or ordering new airplanes with exits deactivated even if regulations allowed such deactivation. The ATA, which represents U.S. air carriers, stated in its comments, "Few ATA members are directly affected by the proposed limitations on seat/exit locations; those which are directly affected have, for reasons of their own, elected to restrict their future airplane seat/exit locations to those which comply with the proposed limits." Therefore, the FAA concludes that the final rule will not have an effect on the revenues of U.S. air carriers because it incorporates current industry practice into regulation.

There may be some unquantifiable safety or cost effects on firms which produce executive configurations of airline transport category airplanes. Some of these newly-manufactured airplanes may be affected by the final rule. However, since most executive conversions are destined for overseas customers, any such airplanes which did not meet the final rule could be accommodated under the deviation authority of Part 21.

A benefit of the final rule is that it will ensure that the current level of safety of B-747 airplanes used in Part 121 operations is maintained by precluding the deactivation of emergency exits. The rule also will prevent any decrease in safety related to emergency exit distances in future airplane designs when compared to current airplanes by establishing an exit-to-exit distance standard.

Regulatory Flexibility Determination

The Regulatory Flexibility Act (RFA) of 1980 was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by Government regulations. The RFA requires agencies to review rules which may have a significant impact on a substantial number of small entities.

This final rule will not have a significant economic impact, positive or negative, on a substantial number of small entities. This regulation will potentially impact primarily two types of entities: the manufacturer of B-747 airplanes and airline operators whose fleets contain B-747 airplanes.

The FAA size threshold for determination of a small entity for aircraft manufacturers is 75 employees; that is, any aircraft manufacturer with more than 75 employees is considered not to be a small entity. The Boeing Company, manufacturer of the B-747 airplane, is not a small entity.

The FAA size threshold for a determination of a small entity for aircraft operators is 9 owned aircraft; that is, any operator with more than 9 owned aircraft is considered not to be a small entity. The FAA threshold for a substantial number of small entities is one third and at least eleven of the small entities must be impacted. There are less than eleven small entities that own B-747 airplanes.

International Trade Impact Assessment

This rule is not expected to have any measurable impact on international trade. Although some foreign operators could modify their airplanes by deactivating exit doors, such an action would not result in any serious competitive disadvantages of U.S. operators doing business abroad. This assessment is based on the fact that some foreign operators have already deactivated exit doors and this practice is not expected to continue to any great extent because virtually all of the world fleet operators, on average, are flying below their maximum seating capacity. Thus,

this rule is expected to have no measurable impact on the trade opportunities for U.S. operators doing business abroad or for foreign operators doing business in the United States.

Federalism Implications

These regulations are issued under the authority of the Federal Aviation Act (Act) of 1958, as amended (49 U.S.C. 1301 et seq.).

The regulations adopted herein will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Thus, in accordance with Executive Order 12612, it is determined that this final rule will not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Conclusion

For the reasons discussed in this preamble and based on the findings in the Regulatory Flexibility Determination and the International Trade Impact Assessment, the FAA has determined that this regulation is not major under Executive Order 12291. In addition, it is certified that this rule will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. This rule is considered significant under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). A regulatory evaluation of the rule, including a Regulatory Flexibility Determination and Trade Impact Assessment, has been placed in the docket. A copy may be obtained by contacting the person identified under "FOR FURTHER INFORMATION CONTACT."

The Rule

Accordingly, the Federal Aviation Administration amends Parts 21, 25, and 121 of the Federal Aviation Regulations ¢14 CFR Parts 21, 25, and 121| effective July 24, 1989.

The authority citation for Part 21 continues to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2); 42 U.S.C. 1857f-10, 4321 et seq., E.O. 11514; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-66

Revision of General Operating and Flight Rules

Adopted: August 7, 1989 Effective: August 18, 1990

(Published in 54 FR 34284, August 18, 1989)

SUMMARY: This amendment reorganizes and realigns the general operating and flight rules to make them more understandable and easier to use. Also, several changes are made to provide more flexibility for certain operations. These changes result from comments received from the general public and aviation industry in response to a request for specific comments to help identify substantive areas needing review.

EFFECTIVE DATE: This amendment becomes effective on August 18, 1990, except that Section 91.203(a)(2) becomes effective September 18, 1989, and remains numbered as Section 91.27(a)(2) until August 18, 1990.

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SUPPLEMENTARY INFORMATION:

Background

On August 9, 1978, the Aircraft Owners and Pilots Association (AOPA) petitioned the Federal Aviation Administration (FAA) to revise Part 91 of the Federal Aviation Regulations (FAR) to make the regulations simpler and more comprehensible. In response to this petition, on January 11, 1979, the FAA issued an Advance Notice of Proposed Rulemaking (ANPRM) No. 79-2 (44 FR 4572; January 22, 1979) consisting of a verbatim publication of AOPA's proposal.

The FAA received 106 comments in response to the ANPRM. An overwhelming majority of the commenters supported the intent of the proposal to reorganize Part 91. However, there were numerous problem areas identified by the commenters relating to the proposed changes that were considered substantive.

On November 18, 1980, the FAA formed a Part 91 Working Group to analyze the AOPA proposal and comments received on the ANPRM. It was determined that certain technical and administrative problems existed and that it was not feasible to undertake a substantive revision of Part 91 at that time. Subsequently, AOPA withdrew its petition. However, review of AOPA's proposal to reorganize and renumber Part 91 revealed that many of the changes had merit and could be implemented. The FAA Part 91 Working Group concluded that the reorganization and renumbering of Part 91 would be the first step to improve the regulation and

make it more understandable and easier to use. Consequently, the FAA published NPRM No. 79-2A (46 FR 45256; September 10, 1981), which proposed to reorganize and realign the general operating and flight rules to make them more understandable and easier to use. Other proposals were made to delete redundancies and obsolete compliance **DATES** and to make other minor changes.

Notice No. 79-2A did not contain any substantive changes; however, it did inform the public that the FAA considered that notice to be the first step in a regulatory review of Part 91 consistent with the objective of Executive Order 12291. With this in mind, the FAA invited additional specific comments to help identify substantive areas to be reviewed and possibly included in subsequent proposals concerning Part 91. The notice further stated that the FAA would not take final action concerning the reorganization until substantive changes were proposed and the public had been given an opportunity to comment on those proposals.

The FAA published Notice No. 79-2B (46 FR 60461; December 10, 1981) to extend the comment period for Notice No. 79-2A by 120 days. That notice was issued in response to a petition from the National Business Aircraft Association to allow additional time for commenters to prepare substantive comments.

The FAA received 69 comments in response to Notice No. 79-2A. The majority of these comments favored the proposal and were discussed in Notice No. 79-2C (50 FR 11292; March 20, 1985).

Notice 79-2C proposed four substantive changes in addition to the numerous changes made to reorganize and clarify existing rules. Two of these changes were made in response to comments received from the public. These changes are as follows:

(1) Section 91.117 - Allows reciprocating-powered aircraft to be operated at 200 knots in an airport traffic area;

(2) Section 91.135 - Allows operators desiring authorizations to deviate from positive control area and route segment requirements to utilize a 48-hour oral notification system;

(3) Section 91.409 - Allows operators of turbine-powered rotorcraft to use an alternate inspection program, such as an FAA-approved inspection program; and

(4) Sections 91.205, 91.509, and 91.511 - Defines "shore" as it is used in these sections to exclude tidal flats.

Public Comments

Forty-seven comments were received in response to Notice No. 79-2C. A number of commenters recommended regulations that were not proposed in the notice. Because such comments

discuss matters which the public has not had an opportunity to consider, they are beyond the scope of the notice and cannot be considered without further notice and public participation. Some of these comments concern proposals that will be considered by the FAA in future rulemaking and, therefore, could be published in a future notice.

There were two areas in particular where several proposals were received that are not within the scope of the notice. First, 11 comments specifically request that balloons be excepted from certain requirements now pertaining to aircraft in general. These comments seek substantive change to the existing regulations not proposed in the notice.

Second, a number of commenters propose substantive changes to the regulations with regard to rotorcraft. Although these comments are not within the scope of this rulemaking, they were considered in the Rotorcraft Regulatory Review Program, Notice No. 5.

Two commenters are opposed to changing masculine references to "airman" to read "he or she." One commenter states that this would keep the text shorter and speed up the reading of the text. The other commenter states that Section 1.3(a)(3) already provides that "words importing the masculine gender include the feminine," and the better course would be to refer to the "person," or the "pilot." The FAA agrees with these commenters. Accordingly, references throughout Part 91 that use the words "he" or "she" have been changed to refer to the "person," the "pilot," the "crewmember," or the "Administrator."

One commenter writes that the use of "pilot in command" and "PIC" is inconsistent in the proposed rules. The FAA agrees with this commenter and, accordingly, has changed references to "PIC" in Sections 91.123(a) and 91.129(b) to "pilot in command" to make their use consistent throughout Part 91.

A commenter suggests that all references to distances expressed in miles should state whether they are statute or nautical miles. The FAA agrees that such references should be clear. Accordingly, references to distance expressed in miles in Sections 91.171(b)(4)(ii) and 91.207(e)(3) are changed by adding the word "nautical" to reflect that the distances are expressed in nautical miles since they reference ground-measured distance. References to visibilities in Sections 91.155(b), 91.167(b)(2)(ii), and 91.303(e) are changed by adding the word "statute" to reflect that visibilities are expressed in statute miles.

Several commenters state that the proposed wording for Section 91.1 implies that operations of moored balloons, kites, unmanned rockets, and unmanned free balloons are governed by Part 103. This comment has merit and Section 91.1 is revised by adding a specific reference to Part 101 after the phrase "unmanned free balloons" to make clear that moored balloons,

kites, unmanned rockets, and unmanned free balloons operate under Part 101.

Another commenter requests clarification of the discussion of Section 91.7 in Notice No. 79-2C, where the FAA states that there is no provision for the use of an approved Minimum Equipment List (MEL) in Part 91 operations, whereas Section 91.213 permits the use of an approved MEL. The FAA points out that at the time Notice No. 79-2C was published, the effective date of current Section 91.30 (proposed Section 91.213) was stayed indefinitely (44 FR 62884; November 1, 1979). Amendment No. 91-192 (50 FR 51188; December 13, 1985) which took effect on March 13, 1986, terminated the stay.

Section 91.7(b), which was proposed without substantive change from existing Section 91.29, provides that a flight should be discontinued when unairworthy mechanical or structural conditions occur. One commenter suggests that this be changed by deleting "mechanical or structural" and making it more general so as to provide for a possible unairworthy electrical system. This suggestion raises a valid point; however, the FAA has determined that the rule should be amended to explicitly reference mechanical, electrical, or structural conditions. Therefore, Section 91.7(b) is amended accordingly.

As suggested by one commenter, Section 91.21(a)(1) is amended by deleting reference to a "commercial operator." This revision conforms Section 91.21(a)(1) with SFAR 38-2 and Part 125 which do not provide for a commercial operator's certificate and, instead, provide for the issuance of either an "air carrier operating certificate" or an "operating certificate."

One commenter states that consideration should be given to better defining "appropriately rated pilot" in Section 91.109 and provide a definition. The FAA agrees that the phrase "appropriately rated pilot" should be defined better.

The preamble to Amendment No. 91-36 (32 FR 260; January 11, 1967) states that an "appropriately rated pilot" in Section 91.21(b) requires a private pilot certificate with an airplane category rating, a multiengine class rating for a small multiengine land plane, and a type rating for a large airplane or a turbojet-powered airplane (large or small).

Accordingly Section 91.109(b)(1) is amended to require that the safety pilot hold at least a private pilot certificate with category and class ratings appropriate to the aircraft being flown.

One commenter urges the FAA to reinsert the current rule regarding visual descent points (VDPs) (current Section 91.116). VDPs are not an integral part of the approach procedure. An aircraft that is not equipped to identify a VDP has the same approach minima as a similar aircraft that is equipped to

identify the VDP.

Mandatory use of VDPs is considered inappropriate for a number of reasons:

(1) VDPs that use Distance Measuring Equipment (DME) fixes may, because of displacement factors and/or fix errors, result in descent angles that are either too shallow or too steep for the approach.

(2) A mandatory VDP rule discourages the purchase and use of the very equipment necessary to identify the VDP. This is so because compliance can only be required of those aircraft that are equipped to identify the VDP.

For these reasons, the final rule, like the NPRM, does not include a mandatory VDP requirement.

Notice No. 79-2C proposed that Section 91.175(a) read: "Unless otherwise authorized by ATC, when an instrument letdown to a civil airport is necessary, each person operating an aircraft except a military aircraft of the United States, shall use a standard instrument approach procedure prescribed for the airport in Part 97 of this chapter." The lead-in clause is changed to read, "Unless otherwise authorized by the Administrator," because ATC does not have the authority to approve a person's non-compliance with this rule.

Several commenters raise objections to proposed Section 91.203(a)(2), which would prevent an aircraft from operating outside of the United States under the temporary authority of the pink copy of the Aircraft Registration Application as provided in Section 47.31(b). The commenters assert that the proposal is a substantive change and not a clarification of the present rule; and that the FAA should consider the economic impact on the industry, the consumers, and the historical precedence of past practices. These commenters suggest that the FAA withdraw the proposal and acknowledge the pink copy of the application as a temporary certificate of registration.

Another commenter is of the opinion that the FAA has not provided discussion, as required by Executive Order 12291, on the economic impacts that would result from the delay between application for an issuance or denial of the registration certificate, under the proposals, in the NPRM. The commenter maintains that future investment purchases and leases would also be adversely affected. Several commenters also question the regulatory consistency that the FAA claims as the basis for the change.

These comments were responded to in full in a Notice of Legal Opinion issued December 1988 (53 FR 50208; December 14, 1988). That Notice of Legal Opinion stated that the limitation of temporary authority to operate an aircraft without

registration to domestic operations (as also provided in new Section 91.203(a)(2)) reflects current U.S. law and practice. Concerning the economic impact of this ruling, the FAA in that Notice of Legal Opinion answered:

The aviation community has always been able to transfer ownership and register their aircraft with minimal difficulty. In order to mitigate the potential hardship that could result from grounding an aircraft used in international operations, pending receipt of a registration certificate, the Registry will, upon request, telex a copy of the Certificate of Aircraft Registration to the individual whose name appears on the application as the registered owner of the aircraft. The telex copy is issued after confirmation of the information contained on an Aircraft Registration Application and determination of eligibility for registration. The telex, which reflects critical and verified information resulting from the evaluation by the Registry of an application for aircraft registration, may be used as a temporary Certificate of Aircraft Registration until the original certificate is forwarded for carriage in the aircraft.

This telex certificate will assist owners who submit an application for aircraft registration and who wish to operate the aircraft as soon as possible in international operations. Since

the telex, by its terms, is a form of registration certificate, the aircraft may be operated in international air navigation consistent with Article 29 of the Convention ¢Convention on International Civil Aviation (61 Stat. 1180; T.I.A.S. 1591; 15 U.N.T.S. 295)|. The Registry will telex this copy within a matter of days -- often within 48 hours -- to be kept in the aircraft until the original Certificate of Aircraft Registration (AC Form 8050-3) is forwarded to the registered owner.

Accordingly, the FAA has determined that the rule should be amended as proposed, and consistent with the Chief Counsel's legal opinion, to provide explicitly that operations of aircraft outside the United States for which an application for registration has been submitted but a certificate of registration has not been issued are not authorized under the Federal Aviation Regulations.

Several judicial decisions have defined the "shore" as including tidal flats. In some parts of the United States, these tidal flats can extend for several miles and, because of the extreme tides prevalent in these areas, the land may be submerged under as much as 25 to 35 feet of water during periods of high tide. The intent of the rule is to require operators carrying passengers for hire over these areas to equip their aircraft with the necessary flotation gear and pyrotechnic devices. Therefore, "shore," when it is used in Sections 91.205, 91.509, and 91.511, is defined to exclude land areas, such as tidal flats, which are intermittently under water.

An incorrect reference to "Section 91.169" was used in

proposed Section 91.409(e), which has been corrected to "Section 91.409" in the final rule.

It was pointed out by several commenters that the word "stop" in Section 91.605(c)(2) was inadvertently included in the proposal and should be deleted. The commenters are correct, and the final rule has been amended accordingly. Also, the word "if" following the word "distance" in that same sentence has been corrected to read "is."

In addition to the specific changes discussed above, minor changes have been made in the wording of the regulations proposed in Notice No. 72-2C. In Section 91.3(b), the word "in-flight" has been inserted to clarify that the deviation authority of Section 91.3 applies only to in-flight emergencies which affect the safe completion of the flight.

The original intent of Section 91.3 was to allow the pilot in command to deviate from certain regulations in the event of an in-flight emergency. Over time, regulations involving non-flight items were inserted into Subparts A and B, while flight-related regulations were inserted in other Subparts. Therefore, the word "in-flight" is being added to return the language to its original intent.

Other changes are nonsubstantive in nature. Except for such minor revisions, those parts of the proposal for which there were no comments are adopted as proposed. Finally, all other sections of Part 91 remain unchanged except for renumbering (see the cross-reference lists below).

Several amendments to Part 91 adopted since Notice No. 79-2C were published are reflected in the final rule. Where reference to other sections of this Part were set forth in an amendment, the references have been changed to reflect the appropriate sections as used in the final rule. Those required changes published in the Federal Register prior to June 19, 1989 are discussed below.

Amendment No. 91-188, (50 FR 15380; April 17, 1985) amended current Section 91.11, which governs the use of alcohol or drugs by any crewmember performing duty during the operation of an aircraft. This amendment took effect on June 17, 1985. Subsequently, Amendment No. 91-194 (51 FR 1229; January 9, 1986) amended Section 91.11(c) to impose a requirement for a crewmember to furnish the results of any test that indicates percentage by weight of alcohol in a crewmember's blood. This amendment took effect on April 9, 1986. Proposed Section 91.17 has been revised accordingly.

Amendment No. 91-189 (50 FR 31588; August 5, 1985) removed references to "expect approach clearance time" in Section 91.127. This amendment took effect on September 4, 1985. Section 91.185 reflects this amendment.

Amendment No. 91-190 (50 FR 45602; November 1, 1985) added a new paragraph (c) to current Section 91.24. This amendment took effect on December 2, 1985. This new paragraph required all aircraft equipped with an operable radar beacon transponder be turned on while airborne in controlled airspace. Subsequently, Section 91.24(c) was amended by Amendment No. 91-203 (53 FR 23374; June 21, 1988). Proposed Section 91.215(c) has been redesignated as paragraph (d) and the changes brought about by Amendment Nos. 91-190 and 91-203 have been incorporated into revised Section 91.215(c).

Amendment No. 91-191 (50 FR 46877; November 13, 1985) amended current Section 91.14 (proposed Section 91.107) by revising the title and the section to include reference to shoulder harnesses. This amendment took effect on December 12, 1985. Section 91.107 has been revised accordingly. Amendment No. 91-191 also added a new paragraph to current Section 91.33 which requires a shoulder harness for specified seats in normal, utility, and acrobatic category airplanes with a seating configuration, excluding pilot seats, of nine or less, manufactured after December 12, 1986. This paragraph appears as Section 91.205(b)(15).

Amendment No. 91-192 (50 FR 51189; December 13, 1985) terminated the suspension of Amendment No. 91-157 (44 FR 43714; July 26, 1979) staying the effective date of current Section 91.30. This amendment took effect on March 31, 1986. Subsequently, Amendment No. 206 (53 FR 50195; December 13, 1988) amended Section 91.30. Section 91.213 reflects these amendments.

Amendment No. 91-193 (50 FR 51193; December 13, 1985) changed the FAA's description of North Atlantic (NAT) Minimum Navigation Performance Specifications (MNPS) airspace to coincide with the International Civil Aviation Organization's (ICAO's) description of the NAT MNPS airspace. This has been reflected accordingly in Section 1 of Appendix C of this final rule.

Amendment No. 91-195 (51 FR 31098; September 2, 1986) corrects the reference to the Department of Defense office in current Section 91.102 restricting the flight of aircraft near space flight operations. This amendment took effect on September 15, 1986. Section 91.143 reflects this amendment.

Amendment No. 91-196 (51 FR 40692; November 7, 1986) upgraded rotorcraft certification and operational requirements, thus effecting amendments to several FARs. This amendment took effect on January 6, 1987. Current Section 91.2 was amended to afford small helicopter operators the opportunity to apply for Category II instrument approach authorization. Proposed Section 91.193 has been revised accordingly. Current Section 91.23 was amended to reduce the IFR reserve fuel requirement for helicopters from 45 to 30 minutes. Proposed Section 91.167 has been amended to reflect this change. Current Section 91.116 (proposed Section 91.175) was amended to establish a separate takeoff minimum for helicopters under IFR, of one-

half mile visibility. Current Section 91.171 was amended to include helicopters in the altimeter system and altitude reporting equipment tests and inspection requirements. Proposed Section 91.411 has been amended to reflect this change. In order to enable rotorcraft to perform Category II operations, Amendment No. 91-196 also amended Appendix A in Part 91 by removing the word "airplane" and replacing it with the word "aircraft" wherever it appears.

Amendment No. 91-197 (52 FR 1836; January 15, 1987) revises the authority citation for Part 91 and adds a new paragraph to current Section 91.213 which states that a commuter category airplane must have a pilot designated as second in command, unless the airplane has a passenger seating configuration, excluding pilot seats, of nine or less seats, and is type certificated for operations with one pilot. This amendment took effect on February 17, 1987. This rule now appears as Section 91.531(a)(3).

Amendment No. 91-198, (52 FR 3391; February 3, 1987) amended current Section 91.24(a) and (b) on ATC transponder and altitude reporting equipment and use. This amendment took effect on April 6, 1987. Subsequently, Amendment No. 91-203 (53 FR 23374; June 21, 1988) amended Section 91.24(b) and (c) and Amendment No. 91-210 (54 FR 25682; June 16, 1989) revised Section 91.24(a).

Proposed Section 91.215 has been revised accordingly. Amendment No. 91-198 also revised paragraph (b)(2)(iii) of current Section 91.90 to allow operations conducted prior to December 1, 1987, in Group II TCAs, to be exempt from the new equipment requirements of current Section 91.24. Amendment No. 91-203 (53 FR 23374; June 21, 1988) subsequently revised Section 91.90, effective July 21, 1988. Amendment No. 91-205 (53 FR 40323; October 14, 1988) further revised Section 91.90 in its entirety effective January 12, 1989. Amendment No. 90-209 (54 FR 24883; June 9, 1989) amended Section 91.90 by delaying the effective date of the section for helicopter operations. The rule, covering all amendments to date, appears in this revision as Section 91.131.

Amendment No. 91-199, (52 FR 9636; March 25, 1987) amended current Section 91.35 by renumbering the paragraphs and adding a new paragraph that requires any operator who has installed approved flight recorders and approved cockpit voice recorders to keep the recorded information for at least 60 days, or longer, if requested by the Administrator or the National Transportation Safety Board. This amendment took effect on May 26, 1987. The amended rule now appears as Section 91.609.

Amendment No. 91-200, (52 FR 17277; May 6, 1987) amended current Section 91.173 by requiring each registered aircraft owner or operator to keep "preventive maintenance" records as well as maintenance, alteration, and records of the 100-hour annual, progressive, and other required or approved inspections,

as appropriate, for each engine, propeller, rotor, and appliance of an aircraft. This amendment took effect on June 5, 1987. This amended rule now appears as Section 91.417(a)(1).

Amendment No. 91-201, (52 FR 20028; May 26, 1987) adds the reference to Part 129 to the exception in current Section 91.161(b) from the requirements of Sections 91.165, 91.165, 91.171, 91.173, and 91.174 for aircraft maintained in accordance with a continuous maintenance program as provided for in Part 129. The amendment took effect on August 25, 1987. This amended rule now appears as Section 91.401(b).

Amendment No. 91-202, (52 FR 34102; September 9, 1987 and 52 FR 35234; September 18, 1987) amended current Section 91.27 on civil aircraft certification requirements by adding a new paragraph (c) to require that a copy of the form which authorized the alteration of an aircraft with fuel tanks within the passenger or a baggage compartment be kept on board the modified aircraft. This new rule now appears as Section 91.203(c). Current Section 91.173 on maintenance records was revised by requiring that such records be made available to the Administrator or an authorized representative of the National Transportation Safety Board and when such a fuel tank is installed as set forth in Section 91.35 as amended pursuant to Part 43, a copy of the FAA Form 337 be kept on board the modified aircraft. This new rule appears as Section 91.417(b) and (c). This amendment took effect on December 8, 1987.

Amendment No. 91-203, (53 FR 23374; June 21, 1988, 53 FR 25050; July 1, 1988, and 53 FR 26592; July 14, 1988) amended or revised Sections 91.24 (ATC transponder and altitude reporting equipment and use), 91.88 (Airport radar service areas), and 91.90 (Terminal control areas), and by adding a new Appendix D entitled "Airports/Locations Where the Transponder Requirements of Section 91.24(b)(5)(ii) Apply," regarding use of transponders with automatic altitude reporting. This amendment took effect on July 21, 1988. Amendment No. 91-205 (53 FR 40323; October 14, 1988) revised Section 91.90 in its entirety effective January 12, 1989. Amendment No. 91-209 (54 FR 24883; June 9, 1989) amended Section 91.90 by delaying the effective date of the section for helicopter operations. These rules now appear in this revision as Sections 91.215, 91.130, 91.131, and new Appendix D to Part 91, respectively.

Amendment No. 91-204, (53 FR 26145; July 11, 1988) amended current Section 91.35 on flight recorders and cockpit voice recorders to require digital flight recorders and voice recorders to be installed on selected aircraft operated in general aviation. The specifications for such recorders are set forth in a new Appendix E to Part 91 for airplanes and in a new Appendix F to Part 91 for helicopters. The amendment is reflected as Section 91.609(b), (c), (d), and (e), and new Appendixes E and F to Part 91. This amendment becomes effective on October 11, 1991.

Amendment No. 91-205 (53 FR 40323; October 14, 1988) revised the classification and pilot and equipment requirements for conducting operations in terminal control areas (TCA's) by amending Section 91.90 to establish a single-class TCA; require the pilot-in-command of a civil aircraft to hold at least a private pilot certificate, except for a student pilot who has received certain documented training; and, to eliminate the helicopter exception from the minimum equipment requirement. The amendment was effective on January 12, 1989. Subsequently, Amendment No. 91-209 (54 FR 24883; June 9, 1989) amended Section 91.90(c)(1) by delaying the application of the section for helicopter operations for one year. Revised Section 91.131 covers these amendments.

Amendment No. 91-206 (53 FR 50195; December 13, 1988) amended Section 91.30 to permit rotorcraft, nonturbine-powered airplanes, gliders, and lighter-than-air aircraft, for which an approved Master Minimum Equipment List has not been developed, to be operated with inoperative instruments and equipment not essential for the safe operation of the aircraft. The amendment also permits general aviation operators of small rotorcraft, nonturbine-powered small airplanes, gliders, and lighter-than-air aircraft for which a Master Minimum Equipment List has been developed, the option of operating under the minimum equipment list concept, or under other conditions as set forth in the amendment. Amendment No. 91-206 also amended Section 91.165 to require that any inoperative instrument or item of equipment permitted to be inoperative under the new amended Section 91.30 to be repaired, replaced, removed, or inspected at the next required inspection for the aircraft. These amendments became effective on December 13, 1988 and appear as Sections 91.213 and 91.405 of this revision to Part 91.

Amendment No. 91-207 (54 FR 265; January 4, 1989) amended Sections 91.1 and 91.61 to extend the controlled airspace and the applicability of certain air traffic rules to coincide with presidential action to extend the territorial sea of the United States for international purposes, from 3 to 12 nautical miles from the U.S. coast. This amendment became effective on December 27, 1988. These amended rules now appear as Sections 91.1 and 91.101.

Amendment No. 91-208 (54 FR 950; January 10, 1989) added a new Section 91.26 to require that any traffic alert and collision avoidance system installed in a U.S. registered civil aircraft must be approved by the Administrator, and if installed, must be on and operating during the aircraft's operation. The amendment became effective on February 9, 1989. The amendment appears herein as Section 91.221.

Amendment No. 91-209 (54 FR 24883; June 9, 1989) delays the effective date of certain navigational equipment requirements of helicopter operations in a Terminal Control Area (TCA) by the amendment of Section 91.91.90(c)(1). The amendment became effective on June 6, 1989. Section 91.131 covers this amendment.

Amendment No. 91-210 (54 FR 25682; June 16, 1989), effective June 16, 1989, amended Section 91.24(a) to allow certain aircraft operators to install non-Mode S transponders in aircraft until July 1, 1992, instead of until January 1, 1992, provided that such transponders are manufactured prior to January 1, 1991, instead of prior to January 1, 1990. This amendment appears as Section 91.215(a).

References to Part 91 found in other sections of the Federal Aviation Regulations have also been amended to incorporate the revised numbering of Part 91. These miscellaneous amendments are found at the end of the amendments to Part 91.

Furthermore, Sections 91.615 through 91.645 as identified in Notice No. 79-2C (50 FR 11292; March 20, 1985) now appear in this final rule as Sections 91.503 through 91.533.

Regulatory Evaluation

FAA analysis indicates that these amendments will not have a significant impact on the public or any level of government on an annual basis. The final rule includes changes to clarify the existing rules by simplifying the language, deleting obsolete requirements, consolidating similar regulations, updating equipment requirements to reflect the state-of-the-art, and relaxing certain operating and flight rule requirements.

Benefits

Section 91.117 allows reciprocating-powered aircraft to be operated in an airport traffic area at indicated airspeeds not greater than 200 knots. The FAA is unable to determine operator time and fuel cost savings because they will largely depend on the type of aircraft involved, desired speed, and weather and traffic conditions. The aggregate annual cost savings to these operators will not be significant because: 1) the normal cruise speed for most single engine reciprocating-powered aircraft does not exceed 156 knots, and 2) pilots of most multiengine reciprocating-powered aircraft, while operating within an airport traffic area, will not exceed the normal aircraft cruising speed which is not significantly greater than 156 knots in many of these aircraft.

Section 91.135 provides for a 2-day advance oral notification for submitting requests for authorizations to deviate from positive control area and route segment requirements. The old rule required a 4-day advance written notification of the proposed operation to ATC. A request for an authorization to deviate from these requirements is an infrequent occurrence. Consequently, the new rule will have minor benefits in terms of cost savings.

Sections 91.205, 91.509, and 91.511 clarify the definition of "shore" as that area of land adjacent to the water which is

above the high water mark, thereby excluding tidal flats. From a safety standpoint, a tidal area covered with water is not as safe an emergency landing place as a dry shoreline. The main benefit is improved survivability from accidents in areas where for-hire operators may not be in compliance with the intent of the present rule. There is insufficient information in accident records to be able to estimate how many deaths could have been avoided through the use of life jackets and pyrotechnic signaling devices in these instances.

Costs

Any cost associated with defining "shore" in Section 91.205 as the high water line is expected to be negligible. The only parties potentially affected are small for-hire operators who do not comply with the obvious intention of the rule as presently worded. The FAA believes these operators are very few (probably less than 20 operators) in number. Such operators are likely to be traversing tidal flats in areas like Alaska. If such operators do not comply with the rule as written now, then the cost of compliance would be a maximum of about $105 per year per aircraft. This assumes a $50 cost for an approved flotation device per seat and a flotation device useful life of 5 years ($10 per passenger seat per year), 10 seats per aircraft for these specific operators, plus $5 per year per aircraft for a pyrotechnic signaling device.

Section 91.409 allows operators of turbine-powered rotorcraft to use alternate inspection programs such as inspections under an FAA-approved continuous airworthiness maintenance program. The operators may now schedule inspections in a manner that allows the highest level of utilization of their rotorcraft.

The FAA estimates that in 1984 there were approximately 3,000 active turbine-powered rotorcraft in non-air taxi use. The FAA assumes that about one-half of the operators of these aircraft would use the new inspection options.

The value of using these options is difficult to estimate. At a minimum, the major effect of this proposed rule would be one additional day per year of rotorcraft utility. The usefulness of this can be set at least at the cost of capital for 1 day. Using an average aircraft value of $300,000 and a use of 250 days per year, the cost of capital can be estimated at $180 per day ($300,000 at 15 percent interest divided by 250 days). Thus, the minimum benefit is approximately $0.27 million per year (half the fleet, 1500 turbine-powered rotorcraft times $180). As the fleet grows, the value of this benefit also increases.

Because of the reorganization and resulting renumbering of provisions, persons who regularly refer to existing Part 91 must familiarize themselves with the new structure. It is also recognized that many non-regulatory materials containing references to present Part 91 sections may have to be modified.

To assist in reference to the new provisions, a redesignation table, similar to the cross-reference table published herein, will be included in subsequent editions of the Code of Federal Regulations. The FAA believes that any short-term costs associated with transition to the reorganized Part 91 will be outweighed by the benefits inherent in a more logically organized set of regulations.

Trade Impact

The FAA has determined that this regulation will have no impact on international trade.

Regulatory Flexibility Determination

The Regulatory Flexibility Act (RFA) of 1980 was enacted by Congress in order to insure, among other things, that small entities are not disproportionately affected by Government regulations. The RFA requires agencies to review rules which may have a "significant economic impact on a substantial number of small entities." As discussed above, the regulatory evaluation for Part 91 indicates that there are no negative or significant economic impacts associated with the proposed rule.

All but four of the changes to Part 91 are editorial or clarifying changes. Three of the four changes result only in minimal benefits being applied. The other is a change to Section 91.205 which, while it is basically clarifying, may involve some minimal cost and benefit. Any economic impact would be minor -- approximately $100 per aircraft per year, and would affect only a few small for-hire operators in Alaska who do not comply with the intent of the rule as presently worded. Thus, the change could not be construed to cause "significant economic impact on a substantial number" of small entities within the meaning of the RFA. Therefore, this rule will not have a significant economic impact on a substantial number of small entities.

Conclusion

The FAA has determined that this document is not considered major under Executive Order 12291 or significant under Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). It causes only four minor changes, three of which will provide benefits with no additional costs to the aviation public. The fourth will impose negligible costs which are substantially outweighed by the benefits provided. Other amendments provide general benefits by deleting obsolete requirements, relaxing certain operating and flight rule requirements, and updating and clarifying the text. Under the provisions of Executive Order 12291, the amendments in this final rule will not have a major economic effect on consumers; industries; Federal, State, or local government agencies; or geographic regions. There will be no significant effects on competition, employment, investment, productivity, innovations,

or the ability of U.S.-based enterprises to compete with

foreign-based enterprises in domestic or import markets. It is certified that under the criteria of the Regulatory Flexibility Act this final rule will not have a significant economic impact on a substantial number of small entities. A copy of the full economic evaluation is filed in the public docket and may be obtained by contacting the person listed in the "FOR FURTHER INFORMATION CONTACT" paragraph of this document.

The Rule

For the reasons set forth above, part 21 of the Federal Aviation Regulations (14 CFR part 21) is amended to read as follows; and parts 1, 23, 25, 27, 31, 33, 35, 36, 43, 45, 47, 61, 63, 65, 71, 91, 93, 99, 103, 121, 125, 127, 133, 135, 137, and 141 of the Federal Aviation Regulations (14 CFR parts 1, 23, 25, 27, 31, 33, 35, 36, 43, 45, 47, 61, 63, 65, 71, 91, 93, 99, 103, 121, 125, 127, 133, 135, 137, and 141) are amended as follows.

The authority citation for part 21 continues to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1421 through 1431, 1502, 1651(b)(2); 42 U.S.C. 1857f-10, 4321 et seq.; E.O. 11514; 49 U.S.C. 106(g)(Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-67

Organizational Changes and Delegations of Authority

Adopted: September 15, 1989 Effective: October 25, 1989

(Published in 54 FR 39288, September 25, 1989)

SUMMARY: This amendment adopts changes to office titles and certain terminology in the regulations that were affected by a recent agencywide reorganization. These changes are being made to reflect delegations of authority that were changed, as well as offices that were renamed or abolished and replaced with new office designations. These changes are necessary to make the regulations consistent with the current agency structure.

FOR FURTHER INFORMATION CONTACT: Jean Casciano, Office of Rulemaking (ARM-1), Federal Aviation Administration, 800 Independence Ave., SW., Washington, DC 20591; Telephone (202) 267-9683.

SUPPLEMENTARY INFORMATION

Background

On July 1, 1988, the FAA underwent a far-reaching reorganization that affected both headquarters and regional offices. The most significant change is that certain Regional Divisions and Offices, which formerly reported to the Regional Director, are now under "straight line" authority, meaning that these units within each Regional Office report to the appropriate Associate Administrator (or Chief Counsel) in charge of the function performed by that unit.

Within Part 11 of the Federal Aviation Regulations (FAR), various elements of the FAA have been delegated rulemaking authority by the Administrator. These delegations need to be updated. In addition, throughout the Federal Aviation Regulations references are made to offices that have been renamed or are no longer in existence as a result of reorganization.

Title 14 of the Code of Federal Regulations must therefore be amended to reflect the reorganizations and changes that have taken place.

Paperwork Reduction Act

The paperwork requirements in sections being amended by this document have already been approved. There will be no increase or decrease in paperwork requirements as a result of these amendments, since the changes are completely editorial in nature.

Good Cause Justification for Immediate Adoption

This amendment is needed to avoid possible confusion about the FAA reorganization and to hasten the effective implementation of the reorganization. In view of the need to expedite these changes, and because the amendment is editorial in nature and would impose no additional burden on the public, I find that notice and opportunity for public comment before adopting this amendment is unnecessary.

Federalism Implications

The regulations adopted herein will not have substantial direct effects on the states, on the relationship between the National government and the states, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Conclusion

The FAA has determined that this document involves an amendment that imposes no additional burden on any person. Accordingly, it has been determined that: The action does not involve a major rule under Executive Order 12291; it is not significant under DOT Regulatory Policies and Procedures (44 FR

11034; February 26, 1979); and because it is of editorial nature, no impact is expected to result and a full regulatory evaluation is not required. In addition, the FAA certifies that this amendment will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

The Rule

In consideration of the foregoing, the Federal Aviation Administration amends the Federal Aviation Regulations (14 CFR Chapter I) effective October 25, 1989.

The authority citation for Part 21 is revised to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 1857f-10, 4321et. seq.; E.O. 11514; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-68
Fuel Venting and Exhaust Emission Requirements forTurbine Engine Powered Airplanes

Adopted: July 26, 1990 Effective: September 10, 1990

(Published in 55 FR 32856, August 10, 1990)

SUMMARY: This final rule codifies as new Part 34 all of the applicable aircraft engine fuel venting and exhaust emission requirements of Special Federal Aviation Regulation (SFAR) 27-5, and the test procedures specified under the regulations implementing the Clean Air Act. This rule consoli**DATES** all of the requirements and test procedures into this part, and inserts into other affected parts the requirements to comply with new Part 34. New Part 34 does not alter any of the requirements specified under SFAR 27-5 or the regulations implementing the Clean Air Act.

EFFECTIVE DATE: This regulation is effective September 10, 1990. The incorporation by reference of certain publications listed in the regulations was previously approved by the Director of the Federal Register on November 22, 1983 (48 FR 56740, December 23, 1983).

FOR FURTHER INFORMATION CONTACT:

Harvey Van Wyen, Research and Engineering Branch (AEE-110),
Office of Environment and Energy
Federal Aviation Administration
800 Independence Avenue, S.W.
Washington, D.C. 20591

Telephone: (202) 267-3558

SUPPLEMENTARY INFORMATION:

This rule replaces SFAR 27-5 with a new Federal Aviation Regulation Part 34 as authorized by Section 232 of the Clean Air Act, as amended (42 U.S.C. 7401) (the Act) and by the authority delegated to the Administrator of the FAA by the Secretary of Transportation. This rule also amends references to SFAR 27-5 in other parts of the FARs (Parts 11, 21, 43, 45, and 91). References to new Part 34 will be added to Parts 23, 25, and 33 of the FARs. This codification of SFAR 27-5 and 40 CFR Part 87 is based on Notice No. 88-9 (53 FR 18530, May 23, 1988). Comments were invited. All comments received have been considered in the issuance of this final rule.

SYNOPSIS OF THE PROPOSAL:

Overview

When the Environmental Protection Agency (EPA) originally issued 40 CFR Part 87, Control of Air Pollution from Aircraft and Aircraft Engines; Emission Standards and Test Procedures in 1973, it was recognized that some portions of the standards could be implemented in a very short time period while other portions would require a much longer time period for development and testing. In accordance with Section 232 of the Clean Air Act, as amended (42 U.S.C. 7401), the FAA proceeded to promulgate compliance regulations for the near-term requirements in the form of a Special Federal Aviation Regulation, SFAR 27-5. Subsequent to the original issuance of 40 CFR Part 87, the EPA has recognized that some of the longer-term requirements were either unneeded or practically unattainable. Those longer-term requirements, originally scheduled to become effective in 1978, have been extensively revised by the EPA. Revised 40 CFR Part 87 now contains all current aircraft and aircraft engine emission standards. Under the requirement of Section 232 of the Clean Air Act Amendments of 1970, the FAA has promulgated, in SFAR 27-5, compliance regulations for all of the standards in 40 CFR Part 87.

By this rulemaking, the FAA will continue to comply with Section 232 of the Clean Air Act Amendments of 1970 by establishing a new Part 34 to 14 CFR containing all of the compliance regulations for fuel venting and engine exhaust emissions. This rule also revises other affected parts to require compliance with Part 34. Since SFAR 27-5 and its amendments were issued, they have, by definition, been considered temporary, and their exact status has been confusing to the parties directly or indirectly affected by the regulations. The other parts directly affected by SFAR 27-5 have heretofore referenced only SFAR 27-5 and the reader has been required to review SFAR 27-5 in its entirety in order to determine its effect on other parts. The FAA, with this final rule, codifies the compliance regulations in a single part of the Federal Aviation

Regulations, and revises the other affected parts accordingly.

The provisions of 40 CFR Part 87 are applicable to each individual aircraft gas turbine engine of the classes, and as of **DATES**, specified in that part. Compliance would require exhaust emission testing of each individual engine that is subject to the requirements of 40 CFR Part 87. The EPA has recognized in the preamble to 40 CFR Part 87, and specifically in Section 87.89, that testing each individual engine would be excessively costly.

The EPA concluded that it was necessary to develop a practical interpretation of the requirement for demonstrated compliance by each individual engine and to substitute a preproduction certification program as a compliance procedure in place of compliance testing. The promulgation of such a preproduction certification compliance program has been delegated to the FAA subject to the concurrence of the Administrator of the EPA. The FAA consulted extensively with the EPA on this matter. The EPA concluded that an acceptable preproduction certification compliance program must demonstrate that, at minimum, with 90 percent confidence, 95 percent of the engines would meet the gaseous emission standards, and with 90 percent confidence, every engine would meet the smoke standards. The International Civil Aviation Organization (ICAO), in its Standards and Recommended Practices for Aircraft Engine Emissions, adopted a similar preproduction certification compliance procedure based upon a composite of historical engine-to-engine variability. Since the EPA stressed the desirability of commonality with ICAO, the FAA, with the concurrence of the EPA, adopted the compliance procedure defined in Appendix 6 to ICAO Annex 16, Volume II - Aircraft Engines Emissions, First Edition, June 1981.

The FAA solicited comments and recommendations concerning equivalent procedures in a Notice of Proposed Rulemaking (53 FR 18530, May 23, 1988). No comments were received on the equivalent procedures issue. The FAA will give any future recommendation full consideration if it is accompanied by substantive supporting data demonstrating equivalency. Should an acceptable equivalent procedure be proposed, the FAA will seek EPA concurrence with that proposed equivalent procedure as an alternative compliance procedure. The FAA cannot, however, adopt any proposed compliance procedure unless it has the concurrence of the Administrator of the EPA.

Regulatory History

Under Section 232 of the Clean Air Amendments of 1970, Pub. L. 91-604, the FAA is required to issue regulations that ensure compliance with all aircraft emission standards promulgated under Section 231 of the Act, which are currently prescribed in 40 CFR Part 87 originally issued on July 6, 1973 (38 FR 19088, July 17, 1973). Accordingly, on December 26, 1973, the FAA issued SFAR 27, (38 FR 35427, December 28, 1973). The purpose of SFAR 27 was

to ensure compliance with the aircraft and aircraft engine emission standards and test procedures issued by the EPA in 40 CFR Part 87.

SFAR 27, as originally issued, required compliance only with those standards and procedures in 40 CFR Part 87 that were effective beginning February 1, 1974. Since its issuance, SFAR 27 has been amended seven times by the FAA. On December 23, 1974, the FAA issued SFAR 27-1 (39 FR 45008, December 30, 1974) to require compliance with the fuel venting emission standards in 40 CFR Part 87 that became effective January 1, 1975. SFAR 27-2, effective January 1, 1976 (40 FR 55311, November 28, 1975), required compliance with smoke emissions standards in 40 CFR Part 87 applicable to new and in-use aircraft turbofan or turbojet engines with a rated power of 29,000 pounds thrust or greater that are designed for operation on subsonic airplanes. SFAR 27-3 (42 FR 64876, December 29, 1977) required compliance with smoke emission standards in 40 CFR Part 87 for JT3D engines manufactured on and after January 1, 1978. A fourth amendment, SFAR 27-4 (45 FR 71960, October 30, 1980), was issued to require phased compliance with smoke emission standards by in-use JT3D engines beginning on January 1, 1981, with total compliance required by January 1, 1985. Subsequently, the requirement for compliance by in-use JT3D engines was automatically deleted under the terms of SFAR 27, Section 3(b), when the EPA deleted the underlying requirement from 40 CFR Part 87 (48 FR 2716, January 20, 1983).

On December 21, 1982, the EPA revised 40 CFR Part 87 and republished the rule in its entirety (47 FR 58462, December 30, 1982). The revised rule contained a number of changes in definitions as well as new standards for smoke and unburned hydrocarbon emissions. The FAA is required by 40 CFR Section 87.89 to establish and approve a testing program to assure compliance with Part 87 by January 1, 1984. On December 8, 1983, the FAA issued amended SFAR 27-5 (48 FR 56735, December 23, 1983) which required compliance with all of the provisions of revised 49 CFR Part 87 and contained an EPA-approved testing program. The effective date of SFAR 27-5 was January 1, 1984. On October 4, 1983, the EPA issued a stay for the January 1, 1984, effective date for EPA's smoke standards, applicable to aircraft turbine engines rated below 26.7 kilonewtons (kN) (6000 pounds) thrust in response to a petition by the General Aviation Manufacturers Association (GAMA) (48 FR 46481, October 12, 1983). On July 30, 1984, the EPA denied the GAMA petition and established an August 9, 1985, effective date for smoke standards applicable to aircraft turbine engines rated below 26.7 kN (49 FR 31873, August 9, 1984). On October 9, 1984, the EPA changed the definition of "very low production" engines in the provisions for exemptions and revised the exhaust emission test fuel specification (49 FR 41000, October 18, 1984). On March 18, 1986, the FAA amended SFAR 27-5 to correct the authority citations for petitions for exemptions to SFAR 27-5 (51 FR 10612, March 28, 1986). On September 15, 1989, the FAA amended SFAR 27-5 to reflect

delegations of authority that were affected by a recent agencywide reorganization (54 FR 39288, September 25, 1989).

Discussion of Comments

A total of seven written responses containing comments were received by the FAA subsequent to the publication of Notice 88-9. All of the comments submitted to the docket have been reviewed. The proposed amendments to Parts 11, 21, 23, 25, 33, 45 and 91 and the new Part 34 have been revised to reflect those relevant comments and suggestions within the scope of Notice 88-9.

Many of the comments regarding technical amendments to Parts 11, 21, 23, 25, 33, 45 and 91 were found to be of sufficient merit to warrant revisions to the final rule. Those comments recommending substantive changes to Part 34 were not adopted, since Part 34 is restricted to the direct implementation of 40 CFR Part 87 which was promulgated by the EPA. The substantive portion of Part 34 is intended to be essentially a word-for-word reproduction of the substantive portions of 40 CFR Part 87. Future comments regarding the substantive aspects of 40 CFR Part 87 should be addressed to the EPA.

Comments pertaining to amending Parts 11, 21, 23, 25, 33, 45, and 91:

One commenter noted that the proposed change in Section 23.903(a)(1) and a similar change in Section 25.903(a)(1) were inconsistent with a previous broad revision for all categories of aircraft which introduced a common requirement with the words "Each engine must have a type certificate." The commenter noted that the wording as stated in the NPRM would exclude engines certificated on the basis of Civil Air Regulation 13 (the predecessor to the present FAR Part 33) and all engines certificated under the provisions of Section 21.29. The commenter's proposed wording also addresses another commenter's concern that the requirement for the certification of each engine under Part 34 should be restated to emphasize that the requirement is in effect only when Part 34 is applicable to that particular engine. The wording proposed by the commenter was adopted for Sections 23.903(a)(1) and 25.903(a)(1) of the final rule.

Regarding the proposed changes to Section 23.951(d) and 25.951(d), two commenters noted that the requirements of Parts 23 and 25 apply to the airplane, not the engines. The proposed change offered by one the commenters was adopted in the final rule by changing the phrase "Each fuel system for a turbine engine must..." to the phrase "Each fuel system for a turbine engine powered airplane must...".

One commenter noted that although the NPRM proposed to amend 14 CFR Parts 11, 21, 23, 45 and 91 and add a new Part 34, there was no corresponding change proposed for Part 33 requiring the applicant for a certification under Part 21 to show compliance

with the applicable requirements of Part 34. The FAA concurs with the comment and has added an appropriate revision to Part 33 in the final rule.

One commenter noted that the proposed wording in the NPRM for Section 45.13(a)(7) and 45.13(a)(7)(i) is inconsistent with the current practice that engines that do not have gaseous or exhaust smoke emission standards imposed by 40 CFR Part 87, namely turboprop (Class TP) engines of less than 1000 kW rated power, do not need to indicate any information on emissions on their identification plates. The commenter recommended adding the words "exhaust emissions" to the first sentence in Section 45.13(a)(7) as follows: "...indicates compliance with the applicable exhaust emissions provisions of Part 34...". A similar change was recommended for Section 45.13(a)(7)(i). These minor clarifications were adopted by the FAA in the final rule. The same commenter also suggested that the requirements for a "permanent powerplant record" under Section 45.13(a)(7)(i) and (ii) be changed to "engine logbook". The suggestion was not adopted in the final rule. The FAA does not have a requirement for an "engine logbook" nor could the FAA determine that "engine logbook" was an industry standard or custom. Therefore, the generic term "permanent powerplant record" was kept in the final rule.

One commenter suggested that as a matter of practical convenience the proposed requirement for 14 CFR Section 91.27(d) commence as follows: ¢14 CFR 91 will be completely revised as of August 18, 1990 (see 54 FR 34284, August 18, 1989) to renumber all of its sections. Section 91.27 will be renumbered as Section 91.203 and Section 91.28 will be renumbered as Section 91.715. Hereafter in this preamble, references to the renumbered Part 91 will be shown in brackets.| "Except as provided in Section 91.28 ¢91.715|, no person...", and that Section 91.28 ¢91.715| be amended to reflect the exhaust emission exemption of 40 CFR Section 87.7, as is currently provided for certificates of airworthiness in Section 91.28(a) ¢91.715(a)|. The recommendation was not adopted in the final rule. Part 87 allows for an exemption for airplanes that do not comply with emission standards when operated on flights of short duration or at infrequent intervals. These exemptions from emission compliance are not as broad as those exemptions allowed for airworthiness under Section 91.28 ¢91.715|. Part 34 does and must reflect the requirements of 40 CFR Section 87.7.

Comments Pertaining to the New Part 34:

Based on the comments received, a definition for "reference day conditions" was added to Section 34.1, and Section 34.1 definitions for "date of manufacture," "aircraft," and "Administrator" were amended for clarity or to conform with an existing definition of the term in use in the FARs.

Several of the comments pertained to typographical errors in the NPRM and the inclusion of additional terms in the

abbreviations table in Section 34.2. The commenters' recommended changes were adopted in the final rule.

Regarding the proposed Section 34.60(b), a commenter suggested that the requirement to use a dynamometer for engines producing shaft power is unduly restrictive. The commenter stated that acceptance testing of most new turboprop engines is done using a propeller with either a calibrated test-stand torquemeter or the engine's integral torque measuring device. The commenter concluded that if these devices are acceptable to the FAA for determining an engine's power output they should be equally acceptable for the Part 34 tests. The comment was not adopted in the final rule. The requirement for the dynamometer was established by the EPA in 40 CFR 87.60(b). The FAA may, however, approve alternative test procedures under the provisions of Section 34.3(a) or Section 34.5 if proper applications are submitted. Part 34 reflects, and must continue to reflect, the requirements of 40 CFR Part 87.60(b).

One commenter indicated that the turbine fuel specifications contained in proposed Section 34.61 are not consistent with the latest American Society for Testing Materials (ASTM) recommendations. In response, the FAA notes that the EPA initially adopted the turbine fuel specifications identical to those contained in Appendix 4 of Volume 2 of ICAO Annex 16. However, after much consideration, the EPA subsequently revised the fuel specifications (47 FR 58462, December 30, 1982). As required, 14 CFR Part 34 must directly adopt the revised EPA fuel specification (with the exception of a correction of a typographical error in the units of measure for kinematic viscosity). It should be noted that Section 34.61 fuel specifications are more stringent than the fuel specifications in Appendix 4 of Volume 2 of ICAO Annex 16.

Section 34.7 states that all petitions for rulemaking involving either the substance of an emission standard or test procedure prescribed by the EPA, or a compliance date for such standard or procedure, must be submitted to the EPA. As stated in the NPRM (53 FR 18530, May 23, 1988), informational copies of such petitions are invited by the FAA. One commenter wrote that to invite rather than require is ambiguous and would set an undesirable precedent. The commenter concluded that if copies of the petition are not required, the provision to invite informational copies of the petition should be removed from the regulation. The commenter's suggestion has not been adopted in the final rule. The FAA feels that the invited information copies will expedite the required consultation process between the FAA and the EPA in order to determine if action on such petitions requires rulemaking under Sections 231 and 232 of the Clean Air Act, as amended.

One commenter was concerned that the fuel venting and exhaust emission requirements of Part 34 would be applied to auxiliary power unit (APU) installations through the requirements of Parts 23 and 25. The EPA proposed to withdraw emission

control requirements from APU's in 1978 (43 FR 12615, March 24, 1978) and omitted APU emission control requirements from their final rule (47 FR 58462, December 30, 1982). Therefore, the FAA does not intend to impose Part 34 requirements on APUs.

A commenter suggested that where engine power is expressed in kilonewton(s), the equivalent in pounds of thrust should also be shown. The suggestion has merit and was adopted in the final rule.

Several commenters suggested changes in the arrangement of Part 34 sections and deletion of certain wording as means of simplifying Part 34 without affecting the content of 40 CFR Part 87. The suggestions were not adopted in the final rule. The FAA chose to incorporate, to the maximum extent possible, the substantive portions of 40 CFR Part 87 into 14 CFR Part 34 on a word-for-word and section-to-section basis in order to maintain consistency between the two bodies of rules.

One commenter requested assurance from the FAA that the new Part 34 would not place any new or additional regulatory burden on owners/operators of in-use JT3D engines manufactured before 1978. New Part 34 is intended to codify only the provisions of Special Federal Aviation Regulation (SFAR) 27-5, and the EPA standards and test procedures contained in 40 CFR Part 87. New Part 34 does not place any new or additional regulatory burden on owners/operators of any aircraft or aircraft engines; it merely recodifies the existing rules of SFAR 27 and 40 CFR Part 87. This includes in-use JT3D engines manufactured before 1978. There is no requirement in new Part 34 to retrofit in-use JT3D engines manufactured before 1978.

Paperwork Reduction Act

Information collection requirements contained in SFAR 27-5 were approved by the Office of Management and Budget (OMB) under the provisions of the Paperwork Reduction Act of 1980 (Pub. L. 96-511) and was assigned OMB control number 2120-0508. That control number will be designated for Sections 34.7 and 45.13, as listed in Section 11.101(a).

Regulatory Evaluation

The FAA has reviewed the final rule establishing the new Part 34, "Fuel Venting and Exhaust Emission Requirements for Turbine Powered Airplanes," to determine what, if any, economic impact it will have on the aviation industry. The FAA concludes that Part 34 will not have a significant economic impact on the aviation industry and that it does not constitute a major rule pursuant to Executive Order 12291.

Section 232 of the Clean Air Act Amendments of 1970, Public Law 91-604, requires the FAA to issue regulations that ensure compliance with all aircraft emissions standards promulgated under Section 231 of the Clean Air Act, which are currently

prescribed in 40 CFR Part 87. These standards and their applicability are clearly defined in 40 CFR Part 87, and the FAA has no option but to enforce them.

As part of the process of promulgating 40 CFR Part 87, the EPA conducted an economic analysis of the proposed regulations and determined that they would not constitute a major rule, as defined by Executive Order 12291 (47 FR 58469, December 30, 1982). This determination was based on the expected economic impact being well below the $100 million per year threshold set forth in the Executive Order, and the expectation that the rules would not impose significantly increased costs or other adverse effects on competition, employment, investment, productivity, innovation, or the ability of U.S. enterprises to compete with those of other countries. The EPA's economic analysis containing this determination can be found in Public Docket Number OMSAPC-78-1, which may be examined at the Environmental Protection Agency, Central Docket Section, West Tower Lobby, Gallery I, 401 M Street, S.W., Washington, D.C., 20406. A copy of the EPA's economic analysis has also been placed in Docket 25613 for the convenience of those interested in reviewing it. The FAA has reviewed and concurs with the findings in the EPA economic analysis.

Following the EPA's revision of 40 CFR Part 87, the FAA issued amended SFAR 27-5 (48 FR 56735, December 23, 1983), which required compliance with all of the provisions of 40 CFR Part 87. The SFAR was most recently amended on September 15, 1989 (54 FR 39288, September 25, 1989). The purpose of Part 34 is to replace SFAR 27-5 as a permanent part in the FAR's and to continue the enforcement of 40 CFR Part 87, as required by the statute. This action does not in any way change, add to, or take away from the standards in 40 CFR Part 87 or the requirements for compliance currently implemented under SFAR 27-5. Part 34 will not impose any new or additional regulatory requirements. On May 23, 1988, the FAA issued a notice of proposed rulemaking indicating its intention to promulgate Part 34. The NPRM contained a regulatory evaluation asserting that no new or additional cost burdens would be imposed by the new regulation. No comments were submitted in Docket 25613 disputing this assertion. Therefore, the FAA is assured that no new or additional cost burden will result from the promulgation of this regulation.

Part 34 is easier to review and understand than SFAR 27-5. Thus, persons affected by 40 CFR Part 87 will be relieved from a burden and a slight, unquantifiable benefit will result from this action. Because this beneficial economic impact is considered minimal, the FAA determines that no further analysis is necessary. Accordingly, the FAA concludes that this rulemaking action will not have a significant economic impact on the aviation industry and that it does not constitute a major rule pursuant to Executive Order 12291.

International Trade Impact Analysis

Part 34 will neither eliminate any present regulation nor impose any new regulation. As a result, affected operators will not incur additional costs or significant costs savings. Thus, Part 34 will not have any impact on trade opportunities for either U.S. firms doing business overseas or foreign firms doing business in the United States.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 was enacted to ensure that small entities are not unnecessarily or disproportionately burdened by Government regulation. The Act requires a Regulatory Flexibility Analysis if a rule has a significant economic impact, either detrimental or beneficial, on a substantial number of small business entities. As noted above, Part 34 will neither eliminate any present regulations nor impose any new regulations and, thus, will not have a significant economic impact, either detrimental or beneficial, on affected operators. Consequently, the FAA determines that, under the criteria of the Regulatory Flexibility Act of 1980, a regulatory flexibility analysis is not required.

Environmental Analysis

Pursuant to Department of Transportation, "Policies and Procedures for Considering Environmental Impacts" (FAA Order 1050.1D, appendix 7, paragraph 4, change 3, December 5, 1986), the FAA is categorically excluded from providing an environmental analysis with regard to Part 34 because it is mandated by law to issue regulations to ensure compliance with the EPA aircraft emissions standards and the EPA has performed all required environmental analyses prior to the issuance of those standards.

Federalism Implications

The regulations adopted herein will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this final rule will not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Conclusion

The FAA has determined that this document involves regulations which are not considered to be major under the procedures and criteria prescribed in Executive Order 12291. The rule is considered not significant under Department of Transportation Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). A copy of the evaluation prepared for this action is contained in the regulatory docket. A copy of the evaluation may be obtained from the person identified in the

section entitled "**FOR FURTHER INFORMATION CONTACT**." For the reasons stated in the regulatory evaluation, I certify that these regulations, if promulgated, will not have a significant economic impact on a substantial number of small entities. In addition, these proposals, if adopted, would have little or no impact on trade opportunities for U.S. firms doing business overseas or for foreign firms doing business in the United States.

The Final Rule

Accordingly, the FAA amends 14 CFR, Chapter I, by amending Parts 11, 21, 23, 25, 33, 43, 45, and 91, and adding a new Part 34 effective September 10, 1990.

The authority citation for Part 21 continues to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 7572; E.O. 11514; 49 U.S.C. 106(g) (Revised Pub. L. 97-449, January 12, 1983).

Amendment 21-69

Airworthiness Standards; Shoulder Harnesses in Normal and Transport Category Rotorcraft

Adopted: August 9, 1991 Effective: September 16, 1991

(Published in 56 FR 41048, August 16, 1991)

SUMMARY: This final rule amends the airworthiness and operating regulations to require installation and use of shoulder harnesses at all seats of rotorcraft manufactured after September 16, 1992. These amendments respond to a safety recommendation from the National Transportation Safety Board and are intended to enhance protection of occupants in rotorcraft.

EFFECTIVE DATE: September 16, 1991; COMPLIANCE DATE: September 16, 1991.

FOR FURTHER INFORMATION CONTACT: Mr. James H. Major, FAA, Rotorcraft Standards Staff, ASW-111, Fort Worth, Texas 76193-0111; telephone (817) 624-5117 or FTS 734-5117.

SUPPLEMENTARY INFORMATION:

Background

These amendments are based on Notice of Proposed Rulemaking (NPRM) No. 89-32, which was published in the Federal Register on

December 8, 1989 (54 FR 50688). The NPRM proposed to amend Parts 21, 27, 29, and 91 of the Federal Aviation Regulations (FAR) to require mandatory installation and use of shoulder harnesses (also called upper torso restraints) at all seats of rotorcraft, regardless of the type certification basis or the seat orientation or location. In addition, the NPRM proposed that the standards would apply to all domestic rotorcraft and foreign rotorcraft imported into the United States that are manufactured after 1 year after publication of the amendments in the Federal Register. These amendments respond to National Transportation Safety Board (NTSB) Recommendation No. A-85-70 to enhance protection of rotorcraft occupants during a "minor crash landing," as specified in Sections 27.561 and 29.561 in effect prior to December 1989.

In the notice the FAA specified that the minor crash landing condition strength standards of the original rotorcraft type design certification basis, such as 4.0 g's forward, etc., for present helicopter designs would be applicable. The increased static strength standards and dynamic test standards of Amendments 27-25 and 29-29 (54 FR 47310, November 13, 1989) apply only to new rotorcraft type designs. In the notice, it was pointed out that Section 91.107 applies to aircraft operations, including rotorcraft, and man**DATES** the use of shoulder harnesses whenever installed in an aircraft. Also, the Technical Standard Order (TSO) system provides in TSO-C114 minimum performance standards for a safety belt and shoulder harness, also known as a Torso Restraint System. Inasmuch as the TSO contains strength standards that exceed the standards contained in these amendments, it is also acceptable for meeting the strength requirements of these amendments.

In addition, TSO-C22 contains minimum performance standards (e.g., 1500-pound) for a one-person safety belt. Combined safety belts and shoulder harnesses were previously approved under this earlier TSO and were installed as an optional feature for many rotorcraft designs. A combined safety belt and shoulder harness manufactured under a TSO-C22 approval may be eligible for installation in compliance with this rulemaking, provided the safety belt and shoulder harness otherwise comply with the applicable airworthiness standards.

All interested persons have been given an opportunity to participate in this rulemaking, and due consideration has been given to all matters presented. Seven commenters, representing rotorcraft manufacturers, an operator, industry groups, airworthiness authorities of other countries, and the NTSB, responded to the NPRM. All but one of the commenters agree with the proposal for mandatory installation and use of shoulder harnesses; however, they do express concerns and make recommendations for changes in the standards. The following discussion contains these recommendations and their disposition.

Discussion of Comments

Sections 21.17 and 21.101 Designation of applicable regulations.

The notice proposed to amend these procedural rules by adding the new retroactive requirements of Sections 27.2 and 29.2. No comments were received. Therefore, the amendments are adopted as proposed.

Sections 27.2 and 29.2 Special retroactive requirements.

The notice proposed to add these new standards requiring a shoulder harness (upper torso restraint) at each seat of U.S.-registered civil rotorcraft manufactured after 1 year after publication of the amendments in the Federal Register. The shoulder harness installation would have to comply with the original rotorcraft certification standards including Section 27.785(b) and (c) or Section 29.785(b) and (c).

An industry commenter supports this change. In addition, the NTSB supports the proposals but recommends that both manufacturers and operators install shoulder harnesses at all seats if the rotorcraft contains structural provisions that accept harnesses installation irrespective of the date of rotorcraft manufacture. The NTSB's suggestion to require a retrofit of existing rotorcraft structurally capable of the harness installation was not adopted because it would be technically impracticable and economically unreasonable for operators to determine which of their rotorcraft, without being modified, were structurally capable of accepting the shoulder harness installations. Also, an additional regulatory evaluation to assess the benefits and costs of such a retrofit requirement would be necessary. Additionally, the FAA determined that manufacturers should be permitted 1 year from the effective date of these amendments to incorporate the design, engineering, and production changes necessary to comply with them.

An international operator recommends that a better approach to accident prevention is improved rotorcraft designs and use of health and usage monitoring systems rather than improved injury prevention or occupant protection standards, as proposed. Nonetheless, the FAA contends that enhanced occupant protection is a viable means of improving occupant safety, since accidents will continue to occur because of operational errors even if all design faults are eliminated. For example, on page 216 of the "Helicopter Association International 1988 Helicopter Annual," the author stated, "The past 10 years of accident data show that 83% of the accidents (218 accidents annual average) are caused by errors in operational techniques and decision making (42.2% and 40.8% respectively)." Thus, fewer than 20 percent of the accidents may be attributed to rotorcraft designs or material faults, and improved occupant protection is warranted.

No comments were received on the proposed compliance date or the proposed effective date of these changes. However, consistent with FAA rulemaking practice, the compliance date has

been extended approximately 30 days in the final rule by adopting a compliance date that is 1 year after the effective date, rather than the publication date, of the amendments.

Commenters requested clarification of the applicable strength standards to employ for this retroactive requirement. Accordingly, Sections 27.2 and 29.2 have been revised by including safety belt and harness design requirements and strength standards, and the paragraphs defining the date of rotorcraft manufacture have been relocated. Since Sections 27.2 and 29.2 are not self-contained, the references to Sections 27.785(b) and (c) and 29.785(b) and (c) are unnecessary and have been removed. The proposals are, therefore, adopted with these editorial changes.

Section 91.205 Powered Civil Aircraft with Standard Category U.S. Airworthiness Certificates; Instrument and Equipment Requirements.

The notice proposed a new paragraph to require installation of a shoulder harness for each seat as a condition for operation of rotorcraft manufactured after 1 year after publication of the final rule in the Federal Register. The operating rule complements proposed Sections 27.2 and 29.2.

No comments were received on this proposal. However, as noted previously, the compliance date has been extended. In addition, rather than referring to Sections 27.785(b) and (c) and 29.785(b) and (c), the rule has been revised to refer to Sections 27.2 and 29.2, which contain the necessary safety belt and harness design standards for the reasons cited previously. Other than these changes, the amendment is adopted as proposed.

Strength Standards.

The applicable strength standards for normal and transport category rotorcraft are referenced in Sections 27.785 and 29.785, respectively. In the preamble to the notice, the FAA stated that the strength standards of the particular rotorcraft certification basis would continue to apply to approval of the mandated combined safety belt and shoulder harness installation.

One commenter emphasizes that application or retention of the strength standards contained in the rotorcraft type certification basis is essential. The FAA agrees. The proposal and the economic analysis were based on retaining the original type certification strength standards, while at the same time applying retroactive shoulder harness design requirements. New Sections 27.2 and 29.2 are adopted as proposed with editorial changes for clarity as already discussed.

Another commenter believes that use of the design standards in the particular rotorcraft design type certification basis, such as 4.0 g's forward inertial factor, etc., is inadequate and that the inertial deceleration factors expected in a survivable crash should be adopted in this rulemaking. Since the proposals

respond to a safety recommendation to enhance occupant protection for newly produced rotorcraft of older designs, the comment is beyond the scope of the notice. The standards adopted in Amendments 27-25 and 29-29 (54 FR 47310, November 13, 1989) significantly increase static strength requirements and add dynamic test requirements for improved occupant protection in a survivable landing impact for new rotorcraft designs. Those amendments respond to the commenter's objective for newly designed rotorcraft and, therefore, no changes are necessary.

A commenter also recommends an additional requirement to assure that any safety belt and shoulder harness would not be installed or otherwise constructed in a way that compromises occupant safety in a survivable crash. Since the installation of the belt and harness must not interfere with the occupant's rapid egress as stated in existing Sections 27.785(c) and 29.785(c) and as newly adopted in Sections 27.2(a) and 29.2(a), the commenter's concern is addressed in the current standards.

Evacuation Provisions

A commenter states that interior clutter from items such as a shoulder harness impedes evacuation of a flooded cabin that may occur after a ditching in water. Sections 27.2(a) and 29.2(a), as adopted, require a single-point release and a means to secure the belt and harness, if necessary, to prevent interference with rapid egress in an emergency; therefore, the commenter's concerns are adequately covered by the new regulation.

Another commenter is concerned about the potential for unacceptable degradation of the emergency evacuation provisions with the use of shoulder harnesses and recommends guidance material to supplement the standards. The commenter further suggests that rotorcraft evacuation tests may be necessary for rotorcraft that hold 45 or more passengers whenever harnesses are installed. Section 29.803 (as amended by Amendment 29-30, 55 FR 7992, March 6, 1990) requires, for new rotorcraft designs, an evacuation demonstration for certain designs, including those that hold 45 or more passengers. An evacuation demonstration was not required before adoption of Amendment 29-30. The installation and use of harnesses for the larger rotorcraft designs should not appreciably degrade evacuation provisions because Sections 27.2(a) and 29.2(a), as adopted, require both a single-point release for the belt and harness and a means to secure the belt and harness, if needed, to prevent interference with rapid egress in an emergency. The FAA notes the commenter's concerns and will monitor initial installations of harnesses for the larger transport category rotorcraft designs. In addition, advisory material will be issued, as needed.

Economic Concerns

An international operator, with experience in operating a fleet of rotorcraft, observed that in several fatal and serious injury accidents, shoulder harnesses would have been beneficial

in only one of those accidents. The commenter contends that shoulder harnesses prevent passengers from assuming the head-on-knees (brace) position and that passengers are more susceptible to spinal injury in this upright position. According to data stated in the preamble of the notice, installation and use of a shoulder harness that restrains an occupant from potential secondary impact and that properly supports the upper torso for the vertical impact loads, when used in conjunction with a safety belt, will significantly enhance safety of the occupants in 52 to 68 percent of rotorcraft impacts.

The commenter further notes a potential inconsistency for those operators who operate new helicopters with shoulder harnesses while also operating the same, but older, model helicopters without any harnesses. With 1,600 seats in the commenter's fleet of helicopters, the commenter concludes that the cost of equipping these aircraft with harnesses should be included in the economic analysis. The commenter contends that the economic impact analysis should address the cost of retrofitting all older helicopters even though not mandated by the rule.

The FAA did not propose mandatory installation of shoulder harnesses for the current fleet of helicopters because it is expected that the costs would exceed the safety benefits. The cost of voluntary "retrofit" of the older helicopters is not a "regulatory" cost of implementing the standards. That is an optional consideration and decision for helicopter operators.

Regulatory Evaluation Summary

Regulatory Evaluation

This section summarizes the regulatory evaluation prepared by the FAA for this regulatory action. This **SUMMARY** outlines the estimated costs to the private sector, consumers, and Federal, State, and local governments, as well as the anticipated benefits.

Executive Order 12291, dated February 17, 1981, directs Federal agencies to promulgate new regulations or modify existing regulations only if potential benefits to society for each regulatory change outweigh potential costs. The order also requires the preparation of a Regulatory Impact Analysis of all "major" rules except those responding to emergency situations or other narrowly defined exigencies. A "major" rule is one that is likely to result in an annual effect on the economy of $100 million or more, a major increase in consumer costs, or a significant adverse effect on competition.

The FAA has determined that this rule is not "major" as defined in the executive order; therefore, a full regulatory analysis that includes the identification and evaluation of cost-reducing alternatives to this rule has not been prepared. Instead, the agency has prepared a more concise document termed a regulatory evaluation that analyzes only this rule without identifying alternatives. In addition to a **SUMMARY** of the

regulatory evaluation, this section also contains a Regulatory Flexibility Determination required by the Regulatory Flexibility Act (Pub. L. 96-354) and an International Trade Impact Assessment. If more detailed economic information is desired, the reader may examine the regulatory evaluation contained in the docket.

Economic Evaluation

This analysis examines Sections 27.2 and 91.205 as if they were a single amendment affecting normal category rotorcraft manufacturers and operators and Sections 29.2 and 91.205 as if they were a single amendment affecting transport category rotorcraft manufacturers and operators. Normally, each amendment would be considered separately and a distinct economic impact analysis would accompany each one. In this instance, however, each group of amendments supports what is essentially a single change. Shoulder harnesses must be installed and available in all seats of all normal or transport category rotorcraft manufactured after September 16, 1991, and, thereafter, operated in the United States. Costs and benefits were analyzed separately because they were expected to differ.

Costs and benefits associated with the final rule were calculated on a per-seat basis in this analysis. The advantage of this approach is that it eliminates dependence on forecasts of the future size and activity of the helicopter fleet, which, in turn, depends on future economic activity. Thus, a positive net benefit per seat indicates a positive net benefit to society for this rule.

At the time the initial regulatory evaluation was prepared, some manufacturers equipped many of their Part 27 rotorcraft seats with shoulder harnesses as standard equipment, which reduces the overall costs and benefits of the final rule. Using a per-seat cost/benefit analysis removes the necessity of reducing total costs and benefits by the estimated number of seats that would have harnesses even without the rule. Further, a positive net benefit per seat justifies the rule because: (1) Manufacturers may not install harnesses that are otherwise standard or optional equipment if the customer so requests; and (2) Manufacturers would be free to change their company policy in the future and no longer provide harnesses as standard equipment.

The final rule requiring newly manufactured rotorcraft to have shoulder harnesses in all seats reduces the number and severity of fatal and nonfatal injuries suffered in rotorcraft accidents. The benefit to be derived by society as a result of this rule is, therefore, the value of those expected injury reductions. The estimated benefits accruing from each seat manufactured pursuant to this final rule are based on accident rates, injury rates and the harness-related reductions in those rates, and benefits per accident over the life of the seat. These factors and associated results are discussed in the following sections. The data used in this analysis are based

upon the Initial Regulatory Evaluation, Initial Regulatory Flexibility Determination, and International Trade Impact Assessment, which are contained in the docket, and upon computer printouts of more recent (1986-1989) rotorcraft accident information. Commenters provided little new or additional data on the proposed rule. Moreover, even though there has been a decline in rotorcraft usage in recent years, the benefits were calculated on a per-seat basis. Therefore, this decline would not have an impact on the final outcome. To provide the public and government officials with a bench mark comparison of the expected safety benefits of a rulemaking action over an extended period of time with estimated costs in dollars, the FAA currently uses a value of $1.5 million to statistically represent a human fatality avoided (in accordance with guidelines issued by the Office of the Secretary of Transportation, dated June 22, 1990). The cost of a serious injury is estimated to be $640,000, and the cost of a minor injury is estimated to be $2,300. On the basis of these cost estimates per type of casualty and using NTSB accident injury data from 1986 to 1989, the FAA estimates that the economic benefit to society of the harness-related injury reductions over the life cycle of a seat manufactured pursuant to this rule will be $1,150 per seat for Part 27 rotorcraft and $1,240 per seat for Part 29 rotorcraft. These estimates are lower than those presented in the initial regulatory evaluation.

The amendment requiring rotorcraft to be equipped and operated with harnesses for each occupant will have a cost impact on manufacturers and operators. The manufacturing and operating costs were summed and converted into expected lifetime costs per seat to get an estimate of cost impacts that could be compared with expected lifetime benefits per seat. The annual weight penalty and the replacement cost were discounted to the present, and both were calculated to account for the possibility that a rotorcraft might be involved in a destructive accident during its life cycle. Compliance with the final rule will impose life cycle costs of about $140 per seat for operators of Part 27 rotorcraft and $350 per seat for operators of Part 29 rotorcraft.

Based upon the costs and benefits discussed earlier, the expected benefits, net of costs, over the lifetime of a seat is $1,010 for each Part 27 seat manufactured pursuant to this rule and $890 for each Part 29 seat. Thus, given the potential economic benefits of lives saved and injuries prevented by using shoulder harnesses, the FAA finds that this rule is cost beneficial.

International Trade Impact Assessment

The rule changes will have little or no impact on trade for both U.S. firms doing business in foreign countries and foreign firms doing business in the United States. In the U.S. market, foreign manufacturers will have the option of producing helicopters that satisfy the new standards and, therefore, will not be at a competitive disadvantage with U.S. manufacturers. Because of the large U.S. market, foreign manufacturers are

likely to certificate their rotorcraft of U.S. standards, which will limit any competitive advantage U.S. manufacturers might gain in foreign markets. Furthermore, it is expected that added costs will be passed on to customers in both domestic and foreign markets.

Regulatory Flexibility Determination

The FAA has determined that under the criteria of the Regulatory Flexibility Act of 1980 and of the FAA small entity size criteria specified in FAA Order 2100.14A, the amendments to Parts 21, 27, 29, and 91 will not have a significant economic impact on a substantial number of small entities. The final rule will directly affect two types of small entities: (1) small rotorcraft manufacturers, and (2) small rotorcraft operators. Each entity is discussed separately.

Small Rotorcraft Manufacturers.

According to FAA Order 2100.14A, the definition of a small aircraft and aircraft parts manufacturer is one with 75 or fewer employees. There is only one rotorcraft manufacture (out of 10) in the United States that meets this definition. FAA Order 2100.14A defines a substantial number of small entities as more than one-third of the group but not fewer than 11. With only one small manufacturer in the United States, there is not a significant economic impact on a substantial number of small entities.

Small Rotorcraft Operators.

The small operators affected by the final rule are commercial operators that are regulated under Parts 91, 133, 135, and 137. The size standards criteria in FAA Order 2100.14A classify operators of aircraft for hire as small if they own, but not necessarily operate, nine or fewer aircraft. Estimates of the number of small operators in the United States and the average number of rotorcraft owned by small U.S. operators can be made based on membership data from the Helicopter Association International.

It is assumed for the purpose of this analysis that all small commercial operators in the United States will be affected by this final rule. This represents a worst-case scenario, since many Part 27 helicopters are currently equipped with shoulder harnesses at all crew and passenger seats. The World Aviation Directory. Winter 1989, identified 214 firms as either helicopter scheduled air services or helicopter nonscheduled and specialty air services in the United States. At least 151 firms possessed 9 or fewer aircraft. Of the 32 firms who did not identify the number of aircraft that they possessed, it is estimated that 27 of them (84 percent) also possess 9 or fewer aircraft.

FAA Order 2100.14A defines cost thresholds for significant

economic impacts for various entity types. The threshold for "operators of aircraft for hire - unscheduled" was $3,300 per year in December 1983 dollars or about $4,100 in second quarter 1990 dollars. The total annualized lifetime cost of complying with the final rule is estimated at about $75 per rotorcraft for operators of Part 27 rotorcraft and $450 per rotorcraft with 12 seats ($1,670 per rotorcraft with 45 seats) for operators of Part 29 rotorcraft.

The final rule would affect only newly manufactured rotorcraft. If, under a worst-case scenario, an operator of a Part 27 rotorcraft purchased nine new rotorcraft manufactured under the final rule over a 10-year period, the total annualized cost due to the rule would be $675, which is less than the $4,100 threshold. A small commercial operator would exceed the annual cost threshold only if the operator replaced at least 9 Part 29 rotorcraft with 12 seats (or 3 Part 29 rotorcraft with 45 seats). This is very unlikely. Furthermore, even if this did occur among all operators with 8 or 9 Part 29 rotorcraft with more than 12 seats, it would represent only 15 commercial operators or 8.4 percent of the 178 commercial operators. The rule, therefore, does not impact more than one-third of affected small entities. Thus, even in the worst case, the final rule would not substantially impact a significant number of small entities.

Federalism Implications

The regulations adopted herein will not have substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Conclusion

For these reasons, and based on the findings in the Regulatory Flexibility Determination and the International Trade Impact Assessment, the FAA has determined that this regulation is not major under Executive Order 12291. In addition, the FAA certifies that these amendments do not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. These amendments are considered nonsignificant under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979.) A regulatory evaluation of the amendments, including a Regulatory Flexibility Determination and an International Trade Impact Assessment, has been placed in the docket. A copy may be obtained by contacting the person identified under "FOR FURTHER INFORMATION CONTACT."

Adoption of the Amendments

Accordingly, Parts 21, 27, 29, and 91 of the Federal Aviation Regulations (14 CFR Parts 21, 27, 29 and 91) are amended effective September 16, 1991.

The authority citation for Part 21 continues to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 1857f-10, 4321 et. seq.: E.Q. 11514; 49 U.S.C. 106(g).

Preamble to Amendment 21-70

Primary Category

Adopted: September 1, 1992 Effective: December 31, 1992

(57 FR 41360, September 9, 1992)

SUMMARY: This final rule establishes a new primary category of aircraft, and new simplified procedures for type, production, and airworthiness certification, and associated maintenance procedures. Aircraft in this category are of simple design intended exclusively for pleasure and personal use. Primary category aircraft (airplanes, gliders, rotorcraft, manned free balloons, etc.) may be unpowered or powered by a single, naturally aspirated engine, with a 61-knot or less stall speed limitation for airplanes and a 6-pound per square foot main rotor disc loading limitation for rotorcraft. Primary category aircraft may have a maximum certificated weight of no more than 2,700 pounds, a maximum seating capacity of four, and unpressurized cabins. Although these aircraft may be available for rental and flight instruction under certain conditions, the carrying of persons or property for hire is prohibited. This final rule also adds a new section addressing the falsification of documents submitted as part of certification for products and parts.

FOR FURTHER INFORMATION CONTACT: Mr. Manuel Macedo, Aircraft Engineering Division (AIR-110), Aircraft Certification Service, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591, telephone (202) 267-9566.

SUPPLEMENTARY INFORMATION:

Availability of Final Rule

Any person may obtain a copy of this final rule by submitting a request to the Federal Aviation Administration, Office of Public Affairs (APA-200), 800 Independence Avenue SW., Washington, DC 20591, or by calling the Office of Public Affairs

at (202) 267-3484. Communications must identify the docket number of this amendment.

Persons interested in being placed on a mailing list for future notices should request a copy of Advisory Circular 11-2A, Notice of Proposed Rulemaking Distribution System, which describes the application procedure.

Background

On March 7, 1989, the Federal Aviation Administration (FAA) published Notice of Proposed Rulemaking (NPRM) Notice No. 89-7 (54 FR 9738), which proposed the adoption of a new category of aircraft to be known as "primary category." Such aircraft would be of simple design and intended exclusively for pleasure and personal use. These aircraft (airplanes, gliders, rotorcraft, manned free balloons, etc.) would be unpowered or powered by a single, naturally aspirated engine having a certificated takeoff rating of 200 horsepower or less, would have a maximum weight of 2,500 pounds or less, and would have unpressurized cabins. The NPRM also discussed proposals for type, production, and airworthiness certification standards and procedures that would be simpler than those currently contained in Federal Aviation Regulations (FAR) parts 21, 23, and 27 that are applicable to aircraft of this size and type.

The NPRM incorrectly stated that, within the primary category, only small propeller-driven airplanes would be subject to the noise requirements of FAR part 36. On August 1, 1991, the FAA published a Supplemental Notice of Proposed Rulemaking (SNPM) (56 FR 36972) that indicated that helicopters in the primary category would also be subject to part 36 requirements.

On August 1, 1991, the FAA also published Notice No. 89-7A (56 FR 36976) which reopened the comment period on the NPRM. The reopening was based on a February 1990 meeting between representatives of the Experimental Aircraft Association (EAA), the Aircraft Owners and Pilots Association (AOPA), and the FAA. The EAA and AOPA requested an opportunity to discuss and revise their original comments concerning primary category aircraft maintenance, the parameters used to define primary category aircraft, and the rental and use of those aircraft for pilot training. During the meeting, the EAA stated that there had been significant developments in the general aviation industry since the date of its original petition in 1984. Specifically, the EEA pointed out that many small aircraft manufacturers had gone out of business, and that kit manufacturers would not want to begin large-scale production of primary category aircraft if the rules were adopted as proposed. Because of the higher cost of preassembled kit aircraft, the EAA indicated that kit manufacturers believe that the major domestic market would consist of fixed-base operators (FBO's) and flying clubs, not individuals.

The EAA also stated that kit manufacturers export 36.5 of their total kit production and believe this percentage would be the same for preassembled kit aircraft. However, the EAA was concerned that other civil airworthiness authorities might not accept preassembled kit aircraft into their respective countries because the aircraft would not meet International Civil Aviation Organization Annex 8 requirements which, the EAA believes, compel the exporting State's certification authority to set aircraft airworthiness standards, and no airworthiness standard was envisioned for primary category aircraft. Consequently, the EAA wished to submit additional comments based on its re-evaluation of the proposed rules. A **SUMMARY** of this meeting has been placed in Docket No. 23345. Following the meeting, the FAA received additional written comments from the EAA, which have also been placed in the docket.

Since the EAA was afforded the opportunity to revise its original proposal, the FAA determined that it was necessary to reopen the comment period for Notice No. 89-7 to afford interested persons the opportunity to comment on those issues addressed by the EAA.

The EAA recommends changing the criteria for primary category aircraft from a maximum weight of 2,500 pounds and a single, naturally aspirated engine with a takeoff rating of 200 shaft horsepower or less, to a maximum weight of 2,700 pounds and a single, naturally aspirated engine, with a stall speed of 61 knots or less for airplanes, and a 6-pound per square foot main disc loading limitation for rotorcraft. According to the EAA, the increased weight would permit manufacturers to produce a four-place aircraft with sufficient performance to operate in high-density altitude conditions. The EAA recommends a stall speed limit instead of an engine horsepower limit because stall speed would better define airplane performance and the airplane's landing speed in the event of a power failure. The EAA believes that, for the last 50 years, the 61-knot stall speed limitation in part 23 has established acceptable levels of single-engine airplane performance for safe operation by general aviation pilots. The EAA also states that a 6-pound per square foot disc loading limitation more accurately describes rotorcraft performance but did not provide any rationale for this belief.

The EAA also urges that the proposed rule be revised to permit the rental of primary category aircraft for pilot training and personal use, noting that the number of normal, utility and acrobatic category training aircraft available has decreased dramatically since the time of its original petition. The EAA asserts that rental for personal use would open a substantial market with FBO's. The EAA continues to support the concept of pilot-owners performing certain maintenance and inspection functions on their own aircraft after appropriate training. The EAA views the conversion of aircraft from the normal, utility and acrobatic categories to the primary category as a means to extend this maintenance privilege. This conversion would be made through the already existing supplemental type certificate (STC)

process. For example, an individual owner or a type certificate holder of an aircraft originally type certificated under FAR part 23 or CAR 3 would submit an application for a STC to convert a specific aircraft or a number of specifically identified aircraft to primary category. As part of the application, the applicant would also submit its proposed special inspection and maintenance program that specifically identifies the inspection and preventive maintenance tasks that may be performed by a pilot owner. The EAA recommends that those primary category aircraft used for rental or pilot training be maintained only by certificated mechanics or repair stations. However, the EAA states that these aircraft maintenance requirements should not apply to those primary category aircraft, maintained by the pilot-owner, when the pilot-owner is giving a demonstration in the operation of that individual aircraft.

At the request of the EAA, the FAA extended the comment period for the two notices to November 29, 1991 (56 FR 49660). The EAA stated that the extent of the issues involved in the reopening required extensive evaluation and review by the aviation community. Many of the organization's members and others in the aviation community receive notification of rulemaking actions through aviation magazines. The EAA stated that it intended to publish the NPRM in its publication Sport Aviation, and believed that other aviation magazines would also publish information on the NPRM.

Discussion of Comments

The FAA received 369 comments in response to the original NPRM and 773 comments in response to the reopening of the comment period and the SNPRM regarding noise. The comments were evaluated to determine the nature of the commenters (individuals, flying clubs, FBO's, manufacturers) and their major concerns. The number of comments received breaks down as follows: Individuals -- 548 comments; Pilots -- 447 comments; Manufacturers -- 29 comments; Associations -- 32 comments; Businesses -- 50 comments; State and local government -- 6 comments; and Other -- 23 comments. The following is a discussion of comments by issue.

Pilot-owner Maintenance

In the original NPRM, the FAA proposed to allow properly qualified pilot-owners to perform inspection and maintenance tasks prescribed and specifically identified as preventive maintenance. To be properly qualified, a pilot-owner would have to successfully complete an FAA-approved course given by an FAA approved aviation maintenance technician school, or by the holder of the production certificate for the pilot-owner's aircraft.

This proposal generated 246 responses of which 184 favored the proposal. The commenters generally agreed that safety will actually increase since owner-pilots would be encouraged to perform maintenance as soon as the need arises rather than wait

until an annual inspection and/or the availability of a certified mechanic. By being allowed to perform maintenance, the FAA anticipates that pilot-owners will also become more familiar with the maintenance needs of their aircraft and thus maintain them more diligently.

Almost all of the 62 responses that oppose the proposal were from individuals who are in maintenance-related occupations or who are members of maintenance-related associations.

The FAA is not persuaded by comments that suggest that the level of safety will decrease as a result of pilot-owner maintenance. Any pilot-owners who aspire to perform additional maintenance tasks on their primary category aircraft must be licensed as private pilots. Each must also be issued a certificate of competency upon completion of an approved inspection and maintenance course. Such courses may be offered by a certificated school, by the holder of the production certificate for the individual aircraft, or by another entity that has a course approved by the Administrator. These special inspection and maintenance courses must be specific to the make and model of the owner's aircraft. With these conditions, the FAA expects that pilot-owner maintenance on these primary category aircraft will not result in decreased safety. Accordingly, pilot-owner maintenance provisions are included in the final rule.

The availability of an optional maintenance program in this rule does not in any way exempt primary category aircraft from the maintenance provisions of Part 43. The FAA does not anticipate approving any special inspection and maintenance program that allows pilot-owners to do their own annual inspections, work on engines, or accomplish any inspection or repair required by an airworthiness directive. Further, all special inspection and maintenance programs will be subject to the recordkeeping requirements that exist for other aircraft under the regulations.

If a pilot-owner operates a primary category aircraft that has had an inspection or maintenance task that is part of its special program performed improperly, certificate action may be taken against that pilot-owner.

Weight Limit

The weight limit of 2,500 pounds proposed in the original NPRM generated 55 comments. Four commenters oppose the concept, suggesting that the horsepower and occupancy restrictions in the proposal would serve to effectively keep the weight within reason. The majority of commenters suggest increasing the weight limit, and offer a variety of suggestions ranging up to 4,000 pounds.

The weight limit of 2,700 pounds proposed in the reopening of the comment period generated 165 comments of which 134 favor

the increase. AOPA states that the revised weight limit more accurately reflects the type of aircraft that will be designated as primary category. The EAA states that the increased weight limit allows for a broader scope of design, including additional weight from additional safety features. A number of commenters and other individuals favor the increased limit because it would embrace a larger number of aircraft on the market and allow more aircraft to convert from the normal, utility and acrobatic categories, allowing more pilot-owners to take advantage of the opportunity to do more of their own maintenance.

A few commenters, including the Sport Aircraft Manufacturers Association, suggested adopting the Canadian microlight weight limit of 3,200 pounds. The Professional Aircraft Maintenance Association (PAMA) opposes the increase, suggesting that it would encompass complex aircraft never intended to be included in the primary category. The PAMA also suggests that the increase would allow greater conversion from the normal, utility and acrobatic categories, thus allowing many older aircraft to avoid annual inspections. The Joint Aviation Authorities (JAA) opposes the 2,700 pound weight limit, suggesting that it would undermine attempts to develop a common code of aircraft certification regulations, resulting in primary category aircraft facing European import restrictions.

In response to the proposed 6-pound per square foot main disc loading limitation for rotorcraft, one commenter states that this is twice the average disc loading limitation of a training helicopter. A 4-pound per square foot main disc loading limitation was offered as an alternative. Another commenter states that the 6-pound per square foot limit is unsafe and unrealistic but gave no rationale for this claim. The FAA disagrees. The FAA is aware of at least one rotorcraft model that is compatible with the proposed primary category rule. It is of simple design, weighs less than 2,700 pounds and has a main disc loading of slightly over 5 pounds per square foot.

The FAA agrees that the proposed weight limit of 2,700 pounds best describes the type of aircraft that the FAA envisions as primary category. The weight of an aircraft is not necessarily indicative of its complexity. The 2,700 pound limit allows sufficient design latitude to accommodate new technology, safety features, and the conversion of a greater number of aircraft from the normal, utility and acrobatic categories.

The FAA does not agree that the 2,700 pound weight limit will undermine efforts toward the harmonization of aircraft certification regulations. As discussed below in the section on the development of certification standards, primary category was developed to provide a stimulus to small aircraft manufacturers in the United States, not to facilitate exportable products. Nor are new aircraft designed and certificated as primary category barred from export; a person wishing to export one must simply obtain the approval of the importing country. Accordingly, the final rule adopts the 2,700 pound weight limit.

Horsepower/Stall Speed Limitations

The 200-horsepower engine limitation proposed in the original NPRM generated 28 comments. Five commenters favor the 200-horsepower limitation and 23 offer alternatives, ranging from 210-350 horsepower. Five of these alternatives suggest a weight-to-horsepower ratio as more appropriate in defining a primary category aircraft. The EAA proposed to replace the 200-horsepower limitation with a 61-knot or less stall speed limitation. This suggestion generated 165 comments of which 150 favor the concept. Those in favor indicate that a stall speed limitation provides a superior indication of an aircraft's handling predictability and performance, whereas a horsepower limitation dictates only cruising speed. A low stall speed, they urge, would enhance safety because most accidents occur during landing and take-off.

Six commenters oppose the use of a stall speed limitation. Of these, two believe that 61 knots is too high, two suggest there should be no stall speed if the pilot can demonstrate proficiency, and two do not give any reason for their opposition.

Nine commenters offer some alternative to the proposal. Of these, seven propose stall speeds varying from 45 to 55 knots and two believe that the 61-knot stall speed limitation should accompany rather than replace the 200-horsepower limitation.

The FAA agrees that a 61-knot or less stall speed limitation is appropriate and that it will encourage the production of safe primary category aircraft. The FAA is persuaded that the 50-year track record of the 61-knot stall speed limitation in Part 23 has established it as an acceptable level of single-engine airplane performance for safe operation by general aviation pilots. Accordingly, the final rule adopts the 61-knot or less stall speed limitation.

Rental and Flight Instruction

The original NPRM stated that primary category aircraft were not intended for compensation, hire, or flight instruction. Eight comments were received on this issue, suggesting that the proposal be revised to allow primary category aircraft rental and flight instruction. The notice reopening the comment period included an EAA-requested change that would allow such rental and flight instruction provided that the aircraft is maintained by an FAA-certificated mechanic or repair station.

This change in the proposal generated 174 comments, 167 favoring the concept, three opposing it, and four offering alternatives. Those in favor indicate that allowing aircraft rental and flight instruction is essential to the success of the proposal, since the possibility of aircraft rental is a primary motivation to produce primary category aircraft. Commenters stress that the largest market for new primary category aircraft

will be FBO's and flight schools. Only after the aircraft have depreciated will private parties be able to afford them. Therefore, if the largest anticipated market is unable to use these aircraft, manufacturers will not produce them.

Three helicopter associations oppose the rental of primary category aircraft. They state that rental of primary category helicopters will have an adverse impact on the rental revenue of operators of existing normal and transport category helicopters. Four commenters offer alternatives that permit rental and pilot training. One recommends allowing flight training in primary category aircraft but only for the pilot-owner's immediate family. One recommends that rental be expanded to include transportation of cargo and passengers. One recommends that rental be allowed for crop dusting. One recommends that primary category be expanded to include complex single-engine designs suitable for training commercial and certified flight instructor applicants.

The FAA agrees that it is reasonable to allow the rental of primary category aircraft, provided that these aircraft are maintained by an FAA-certificated mechanic or repair station. This maintenance requirement is necessary to ensure the most consistent performance of maintenance for aircraft used by non-owner pilots. The FAA does not agree that usage should be expanded to include use for compensation or hire, such as the transport of goods or passengers. The primary category was intended to create a new class of personal and recreational use aircraft, not an additional vehicle for commercial purposes. Thus, the rule allows rental of primary category aircraft for the personal use of the pilot, but would not extend this use to that pilot's taking on paying passengers, hauling freight, or any other compensated activity.

Subject to the operating limitations of Section 91.325 and Section 91.409(b), primary category aircraft may be used for flight instruction. Pilot certification in these aircraft is limited to aircraft that otherwise meet the requirements of FAR Section 61.45.

Primary Category -- Light

The original NPRM proposed "Primary category -- light" as a sub-category of aircraft. This proposal generated considerable opposition from the ultralight community, as well as some confusion. Of the 148 comments received on this issue, 106 opposed the proposed new designation.

The NPRM did not identify clearly that primary category-light was proposed as an option for ultralights of expanded design. It would have offered optional certification for certain ultralights to become certificated and issued special airworthiness certificates as primary category aircraft, provided that they weighed no more than 1,000 pounds. Currently these expanded-design ultralights must receive either special or

standard airworthiness certificates since they exceed the weight criteria to be considered an ultralight vehicle under Part 103. In general, the commenters suggest that the proposed classification would separate the two-seat ultralight trainers from the rest of ultralight aircraft, forcing aspiring ultralight pilots to obtain flight training in heavier, conventional aircraft. This would cause problems, many believe, because ultralight student pilots would be unaccustomed to the handling qualities of an ultralight. Approximately 90 ultralight advocates suggest revising Part 103 as an alternative to the primary category-light classification. One ultralight manufacturer makes a similar suggestion, recommending that Part 103 be revised to accommodate a two-seat ultralight trainer. The commenter also notes that several foreign countries are operating mandatory ultralight programs in airworthiness, pilot and instructor ratings, and aircraft registration.

The FAA agrees that the primary category-light classification is inappropriate, and it is not included in the final rule. Comments concerning amendments to Part 103 are beyond the scope of this rulemaking, since no amendments to Part 103 were proposed.

Impact on Manufacturers

The FAA requested comments on the EAA/AOPA claim that a primary category aircraft would be less costly to manufacture, thereby allowing manufacturers to fill a demand for low cost aircraft. In response to the original NPRM, 11 commenters responded to this claim. Ten state that it will have a positive impact, but submitted no support for their statements. One manufacturer states that the creation of a primary category will not offer any substantial benefits to manufacturers unless savings reach 35 percent compared to existing certification costs. The commenter claims that anything less would offer no incentive to divert production from aircraft that qualify for standard airworthiness certificates, which offer greater marketability. However, the manufacturer submitted no support for this claim.

The reopening of the comment period generated 128 comments on the impact of the primary category on manufacturers. All but two commenters state that the proposed rule would have a positive impact. The commenters agree that the proposal will encourage manufacturing and offer incentives to employ new technology. The FAA agrees with the original petitioners that this rule will stimulate aircraft manufacturing and benefit the general aviation industry overall.

The final rule permits kit aircraft supplied by the holder of a production certificate to be assembled by another person under the supervision and quality control of the production certificate holder. Under these circumstances, the production certificate holder retains its responsibilities under FAR Section 21.165; these responsibilities cannot be delegated to the person

assembling the aircraft. Enforcement may be taken against the production certificate holder for any noncompliance with its approved quality control procedures discovered by the FAA at the assembly location. Further, the reporting requirements of Section 21.3 remain the responsibility of the type certificate holder.

Alternatively, if a kit aircraft supplied by the holder of a production certificate is assembled by another person who is not under the supervision and quality control of the production certificate holder, the completed aircraft is eligible only for an experimental airworthiness certificate.

Pilot-Owner Cost Reduction

The FAA requested comments on whether primary category aircraft would be less costly to own and operate as a result of the pilot-owner's ability to perform certain maintenance tasks. Forty comments were received in response to the original NPRM, and 78 in response to the reopening of the comment period. All but two indicate a belief that aircraft in the new primary category would benefit from reduced operational costs. Almost all of the commenters suggest that the reduced costs that result from the ability to perform additional maintenance would allow owner-pilots to afford additional flight time, which would benefit the industry as a whole. However, the PAMA states that any savings would be nominal and not worth the trade-off in safety that would result from increased pilot-owner maintenance, although PAMA did not submit any analysis to support its claim.

The FAA does not agree that increased pilot-owner maintenance tasks will result in reduced safety. All pilot-owners who aspire to perform additional maintenance tasks on their primary category aircraft must hold a private pilot's certificate and be issued a certificate of competency upon completion of an approved special inspection and maintenance course offered by a certificated school, by the holder of the production certificate for the specific aircraft, or by another entity that has a course approved by the Administrator. The FAA anticipates that this feature of the rule will encourage regular maintenance and provide pilot-owners an economic incentive to become more familiar with their aircraft.

Growth in Personal-use Aircraft

The FAA requested comments on the petitioners' claim that primary category aircraft would stimulate the introduction of new, less costly, personal-use aircraft. All 99 commenters responding to the original NPRM and the reopening state that the proposal would have a positive impact on the number of personal-use aircraft, indicating that there is an untapped market for kit aircraft in completed form. Twenty-two of the commenters note that the need to replace aging training aircraft will ensure the demand, while the proposed rule offers sufficient incentive to ensure the supply.

Limited Checkouts

The reopening of the comment period included a proposal by the EAA to allow the use of primary category aircraft that are maintained by the pilot-owner to be used for limited checkouts. A limited checkout is an opportunity for a pilot to become familiar with the aircraft flight manual, receive a briefing on the aircraft characteristics from the pilot-owner, and conduct a short local flight that includes at least three takeoffs and landings. Of the 91 responses to this issue, 89 favor allowing limited checkouts. Only nine commenters offer any rationale for their support of limited checkouts in pilot-owner maintained primary category aircraft, stating that they are necessary to the eventual commercial resale of these aircraft.

The FAA agrees. Pilot-owners authorized to perform additional maintenance tasks who wish to allow a prospective buyer to examine the aircraft, or wish to receive flight instruction in their own aircraft are not required to have their aircraft maintained by an FAA-certificated mechanic or repair station. Without this allowance, the pilot-owners would be forced to use FAA-certificated mechanics or repair stations to maintain their aircraft in order to eventually offer it for sale and allow a prospective purchaser to fly it, or the pilot-owners would be forced to rent an aircraft in order to receive flight instruction. Accordingly, Section 91.325 permits a person other than the pilot-owner to operate a primary category aircraft maintained by the pilot-owner as long as the pilot-owner is not compensated for its use. This allows a pilot-owner to lend the aircraft to a pilot friend, for example, or to demonstrate the aircraft to a prospective buyer.

In addition, a pilot-owner whose certificate is not current may regain currency using a certificated flight instructor in the pilot-owner's self-maintained primary category aircraft. Flight instruction for hire in self-maintained primary category aircraft is limited by the restrictions in Section 91.325, and by Section 91.409(b), which prohibits paid flight instruction from being given in an aircraft provided by the instructor unless that aircraft has been inspected as described in Section 91.409(b).

Development of Certification Standards

The original NPRM proposed that private industry be allowed to develop certification design standards through associations and consensus groups, and submit those standards to the FAA for approval. The original NPRM generated 36 comments on this issue, while 46 were received in response to the reopening. Approximately 75 of the commenters favor using the private sector to develop and streamline certification standards. Only 7 commenters oppose the concept. Commenters recommend that FAR Part 23, Civil Aviation Regulations (CAR) Part 3, and the Civil Aeronautics Manuals (CAM) 3 and 18 are viable bases from which

primary category aircraft certification standards could be established. Eleven commenters suggest that reliance on the private sector would be the best way to develop standards for approving design and materials use. The Australian Civil Aviation Authority suggests Part 23 Appendix B as an appropriate resource from which to develop suitable simplified control surface loadings.

Nineteen commenters suggest streamlining the current certification process rather than creating a new one. The benefits of this streamlined certification process would include a stimulation of light aircraft production, the development of new technology, and the introduction of training aircraft of new design.

One manufacturer states that Part 23 certification standards are neither difficult nor costly, and suggests revising Part 23, Appendix A instead of allowing industry to submit new standards. The commenter states that small manufacturers will not benefit from the creation of a primary category because the lack of certification standards will inhibit the international marketability of the products.

The FAA agrees that the development of certification standards by the private sector represents the most productive and cost-effective manner of streamlining the certification process. The development of airworthiness design criteria by the private sector would be similar to the FAA's Technical Standards Order (TSO) authorization program. The FAA's TSO program has been highly successful in promoting design, production, and quality control of many articles which are critical to aircraft safety. The FAA's TSO approval process enables the public to benefit from the collective technical knowledge of the private sector. This is discussed in more detail in the following section on type certification.

The FAA does not agree that the creation of a primary category will not benefit small manufacturers. The rule is intended to provide an economic stimulus to the U.S. small aircraft industry by reducing certification and manufacturing costs. Moreover, although the rule was not designed to facilitate the development of aviation products for export, primary category aircraft may be eligible for export certificates of airworthiness issued under Part 21, Subpart L.

Comments received on this issue reflect a misunderstanding of the requirements for the export and import of aeronautical products. Under the provisions of the Chicago Convention, a signatory country may permit aircraft from other countries to operate in its airspace. To do so, an aircraft must have an airworthiness certificate issued by the country of registration, based on a detailed and comprehensive airworthiness code as described in ICAO Annex 8 to the Chicago Convention. An aircraft that does not meet Annex 8 Standards may nonetheless be permitted to fly in an ICAO country, but only with the prior permission of

the cognizant airworthiness authority. Thus, owners of U.S.-registered primary category aircraft seeking to operate outside of the United States would require prior permission of the appropriate airworthiness authority.

Annex 8 represents an operating limitation entirely separate from the ability to export or import a product. Under Section 21.329, export certificates of airworthiness may be issued only for aircraft eligible for a standard airworthiness or restricted airworthiness certificate unless the importing country indicates that an aircraft with a special airworthiness certificate is acceptable. Thus, an applicant can obtain an export certificate of airworthiness for a primary category aircraft if it presents the evidence required under Section 21.327(e)(4) that the importing country's airworthiness authority has agreed. The export certificate of airworthiness would include a notation that the product does not meet Annex 8 standards.

Type Certification

Excluding the weight and horsepower/stall speed issues discussed previously, 39 comments were received concerning development of other primary category criteria. One manufacturer suggests that power-plant certification be addressed in the type certification process, as suggested in the original NPRM.

The JAA suggests that occupancy be limited to two people. The PAMA suggests that the definition of primary category aircraft be revised to exclude complex systems such as constant speed propellers, retractable landing gear, and hydraulic systems.

The FAA disagrees with the limitations suggested by some commenters because those limits would exclude many present simple aircraft types that have excellent safety records from converting to primary category. These lower limits would also preclude a number of kit aircraft currently being manufactured and certificated in the experimental category from obtaining a primary category type certificate, production certificate, and a special airworthiness certificate. The FAA finds no safety-related reason to restrict primary category eligibility to less than that contained in the revised proposal. The EAA suggests that the conversion of aircraft originally type certificated under FAR Part 23 or CAR 3 to the primary category could be accomplished using the STC process. The FAA agrees with this method as an acceptable means of conversion. When making an STC application for conversion, the applicant must submit the special inspection and maintenance program which specifically identifies the inspection and preventive maintenance tasks that may be performed by the pilot-owner, as provided in new Section 21.184(c).

The simplified type certification process envisioned for primary category aircraft is expected to draw heavily from airworthiness standards already in the regulations, existing

delegation procedures, and statements of compliance made by applicants for type certification. Applicable airworthiness standards may be approved using a procedure similar to the FAA's Technical Standards Order authorization program, which is used currently to approve the design and production quality control of aviation products that are critical to safety and that are installed on normal category aircraft.

To complete its type certification program, an applicant must submit a compliance checklist addressing all applicable airworthiness standards. This checklist must contain a **SUMMARY** of the methods used to determine compliance with the airworthiness standards previously approved, and must reference all reports or records of engineering analysis and test data used to establish compliance. This checklist must be retained by the applicant as a permanent part of its certification file. These simplified procedures will result in less FAA involvement as compared to current aircraft certification procedures. While the ultimate responsibility to make findings regarding the issuance of type certificates remains with the FAA, the agency anticipates remaining selectively involved in the administration of individual type certification applications.

Primary Category Aircraft Operating Limitations

The original NPRM proposed three basic operating limitations: (1) primary category aircraft could not be used for carrying persons or property for hire or compensation; (2) primary category-light aircraft could not be used in any controlled area; and (3) primary category-light aircraft could only be operated using visual flight rules (VFR). The notice reopening the comment period included an EAA-requested change that would allow the use of primary category aircraft for training and for rental if the aircraft is maintained by an FAA-certificated mechanic or repair station. Thirty-five comments were submitted in response to the original NPRM, while the reopening generated four comments on this issue. Four commenters suggest that the proposed prohibition against carrying persons or property for compensation or hire is unreasonable for those primary category aircraft certificated to a level of safety equivalent to aircraft having standard airworthiness certificates.

The FAA disagrees. As discussed previously, primary category is an effort to develop a simplified certification process to stimulate the production and use of simpler personal-use and recreational aircraft. The process was never intended to create another form of commercial aircraft. The FAA considers the current choice of aircraft certification categories and standards sufficient for the safe development of commercial aircraft. Since no commercial use was ever intended or proposed, discussions of specific uses for compensation or hire are beyond the scope of this rulemaking.

Also as discussed previously, the FAA agrees that primary

category aircraft may be used for rental or flight instruction. Primary category aircraft rental is permitted under Section 91.325 if the aircraft is maintained by an FAA-certificated mechanic, and for flight instruction pursuant to the limitations of Sections 91.325 and 91.409(b). This availability for rental and flight instruction is expected to create a demand for privately owned aircraft that is sufficient to stimulate their production.

Inspections

The original NPRM included a proposal that (1) would allow properly qualified pilot-owners to perform specific inspection tasks that are specifically identified in an FAA-approved special inspection and maintenance program developed for the particular aircraft, and (2) would allow a 24-month inspection in place of the standard annual inspection. A total of 27 comments were received concerning these proposals. Thirteen comments favor the proposal but offer no rationale. Eight comments suggest various alternative periods for the periodic inspection, but offer no justifications for the suggested alternatives. Six comments oppose the proposal, stating that safety will decrease by allowing pilot-owners to perform inspection functions and by extending the periodic inspection period. The FAA disagrees with the statements that pilot-owner inspection and maintenance would reduce safety. Pilot-owners will be required to satisfactorily complete an FAA-approved special inspection and preventive maintenance training program, and to obtain a certificate of competency for the particular aircraft involved, before being allowed to perform the specified inspection and maintenance tasks.

The FAA agrees that an increase in the required inspection interval could be detrimental to overall safety. There is significant, successful history supporting the standard 12-month inspection period required for all other certificated aircraft, and little viable rationale was submitted in support of extending it for primary category aircraft. Accordingly, the 12-month annual inspection interval required by FAR Section 91.409(a) (or the 100-hour interval required by Section 91.409(b)) is applicable to primary category aircraft.

Noise Standards

Five commenters object to the application of Part 36 noise standards to primary category aircraft, suggesting that compliance with Appendix H, in particular, will jeopardize the production of primary category helicopters. As stated previously, the applicability of Part 36, Appendix H noise standards is mandated for all aircraft for which a type certificate is sought on or after March 6, 1986. As discussed in the SNPRM, the FAA is required to determine whether noise abatement is achievable by prescribing standards. The Noise Control Act of 1972 amended the Federal Aviation Act, leaving the FAA no discretion in this matter when issuing a type certificate.

In general, no noise certification under Part 36 is required for a small airplane that was type certificated before the requirements of Part 36 became effective. However, these airplanes must demonstrate compliance with Part 36 if there is an acoustical change made to the airplane, or if there is a change in the type or airworthiness certification, such as a change from a normal to a special certificate, or from a standard to a restricted airworthiness certificate.

The final rule makes an exception for certain older airplanes that were type certificated before Part 36 existed, that are to be converted to primary category, and that have not undergone an acoustical change. Section 36.501(a)(3) states that an airplane that, (1) was type certificated in the normal, utility or acrobatic category, (2) has a standard airworthiness certificate, (3) has not undergone an acoustical change from its type design, (4) has not previously been certificated under Appendix F or G of Part 36, and (5) that will be converted to primary category need not undergo noise certification under Part 36.

Without this exception, an owner of an older airplane that seeks to gain the other benefits of primary category certification would have to show compliance with Part 36 through a noise certification test because of the simple paperwork conversion to a primary category type certificate. Such tests may be beyond the financial resources of many of the pilot-owners that were meant to benefit by the creation of the primary category and its optional maintenance program features.

This exception will be narrowly construed to include only those older airplanes for which noise certification was not required at the time the original type certificate was issued. Any airplane that has undergone an alteration from its original type design that would cause an acoustical change is not covered by this exception, and must demonstrate compliance with Part 36, Appendix G before a primary category type certificate will be issued. Only airplanes with the noted type and airworthiness certifications are eligible for this exception; other airplanes that change their type certification to primary category must demonstrate compliance with Part 36, Appendix G.

Section 36.805(d)(2) makes this same exception for helicopters that have type or airworthiness certificates that are not subject to compliance with Part 36.

Pilot Certification

The proposed rule did not allow pilot schools to use primary category aircraft for pilot certification. Two manufacturers and one pilot objected to this prohibition, indicating that pilot certification should be allowed.

Upon further review, the FAA has concluded that primary

category aircraft are appropriate for pilot certification. The FAA anticipates that many normal category aircraft that could have been used for pilot certification will be converted to primary category. The FAA has found no reason why these aircraft, or newly type certificated primary category aircraft, should not be used for pilot certification, provided that the aircraft meet the requirements of FAR Section 61.45. Conversely, any primary category aircraft, whether converted or newly type certificated, that does not meet the requirements of Section 61.45 may not be used for pilot certification. However, experience gained in these aircraft may be creditable toward other pilot certification requirements.

Falsification of Documents

The NPRM proposed a new Section 21.2 addressing the falsification of certificates, approvals, and delegations submitted under Part 21. Section 21.2 is intended to deter fraudulent or intentionally false information from being submitted. The regulation was modeled after similar provisions found in FAR parts 43, 61, 63, 65, and 143 for certificates, authorizations, and ratings issued under those parts.

No comments were received regarding this proposal. Accordingly, Section 21.2 is adopted as proposed.

Other Airworthiness Issues

Section 21.184(c) provides for an aircraft with a standard airworthiness certificate to obtain a primary category airworthiness certificate. The FAA cautions, however, that these same aircraft cannot reconvert to a standard airworthiness certificate without a showing that they meet all of the criteria for a standard airworthiness certificate as prescribed by the regulations. Such showings have historically been difficult when an aircraft has remained in a different classification or category for a lengthy period. To facilitate the return to a standard airworthiness certificate, the aircraft records should indicate that the aircraft has been maintained according to the manufacturer's instructions, and that any modifications to the aircraft were either removed or are approved by the FAA, in addition to indicating that all other applicable requirements have been met.

Section 21.184(b) creates a new classification of special airworthiness certificate designated special airworthiness certificate-primary category. Section 21.184(a) allows an applicant to obtain this primary category special airworthiness certificate when the provisions of FAR Part 21 are met for a specific primary category aircraft.

Maintenance Training

The reopening of the comment period on the proposed rule included an amendment to FAR Part 141, Pilot Schools, to include

provisions for the instruction of pilot-owners in the maintenance of their primary category airplanes. After further consideration, the FAA has determined that this proposal is inappropriate. The FAA does not consider pilot schools to be the proper forum for instruction in maintenance tasks. The maintenance tasks for primary category aircraft must be tailored for the specific make and model aircraft. In most cases, this would present a curriculum development burden on pilot schools. The FAA considers FAR Part 147, Aviation Maintenance Technician Schools, to be the proper vehicle for such regulations. The amendments to Part 147 containing these provisions are adopted as proposed. In addition, the final rule allows the holder of the production certificate for a primary category aircraft to give instruction in maintenance and to issue certificates of competency in maintenance for that aircraft. Such maintenance programs and instruction must be approved as part of the aircraft's type certificate. The final rule also allows other entities to provide maintenance instruction to pilot-owners provided that the course is approved by the Administrator.

Aircraft Identification

To remain consistent with current regulations and policy concerning the identification of an aircraft with a data plate, the FAA found that kit-built aircraft had to be included in FAR Section 21.182(b). No comments were received on this proposal. Accordingly, the final rule incorporates this addition.

Regulatory Evaluation Summary

This section summarizes the full regulatory evaluation prepared by the FAA that provides information on the economic consequences of this regulatory action. This **SUMMARY** and the full evaluation quantify, to the extent practicable, estimates of the costs and benefits to the private sector, consumers, and Federal, State, and local governments.

Executive Order 12291, dated February 17, 1981, directs Federal agencies to promulgate new regulations or to modify existing regulations only if potential benefits to society outweigh potential costs for each regulatory change. The order also requires the preparation of a Regulatory Impact Analysis of all major rules except those responding to emergency situations or other narrowly-defined exigencies. A "major" rule is one that is likely to have an annual impact on the economy of $100 million or more, to have a major increase in consumer costs, or to have a significant adverse effect on competition.

The FAA has determined that this rule is not major as defined in the Executive Order. Therefore, a full regulatory analysis that includes the identification and evaluation of cost-reducing alternatives to the rule has not been prepared. Instead, the agency has prepared a more concise regulatory evaluation that analyzes only this rule without identifying alternatives. In addition to a **SUMMARY** of the regulatory

evaluation, this section also contains a regulatory flexibility determination required by the 1980 Regulatory Flexibility Act (5 U.S.C. 601, et seq.) and an international trade impact assessment. The complete regulatory evaluation is available for inspection in the docket.

Cost-benefit Analysis

Because of several confounding factors, the FAA is unable to plausibly estimate the number of aircraft that will be certificated under the provisions of this rule and the associated cost differentials. These factors include alternative certification options, manufacturers' legal liability, owner's insurance, resale value of primary category aircraft, and the cost of pilot-owner maintenance training. Nevertheless, the rule can be deemed to be cost-beneficial by virtue of its optional nature and retention of current safety levels. Manufacturers and pilot-owners will elect primary category certification only if it is in their economic interests to do so.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) requires Federal agencies to review rules that may have a "significant economic impact on a substantial number of small entities." The entities that will be affected by this rule are aircraft manufacturers. Based on FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, a small aircraft manufacturer is one with fewer than 75 employees; a substantial number is one that is not less than eleven and that is more than one-third of the affected small entities; and the significant economic threshold for aircraft manufacturers is an annualized cost of $18,200 in 1992 dollars.

Based on the identification and analysis of 17 small manufacturers of conventional categories of aircraft and 110 kit manufacturers of amateur-built airplanes and helicopters, the FAA concludes that this rule could have a significant positive economic impact on a substantial number of small entities. Because of the optional nature of the rule, however, an analysis of alternatives as would otherwise be required by the RFA is unwarranted.

International Trade Impact Assessment

This rule will have little impact on international trade. Both foreign and domestic manufacturers applying for certification in the United States will have the option of using this final rule or an alternative means of certification. Other aviation authorities may not accept primary category aircraft; however, kit manufacturers may continue to sell their unassembled kits abroad.

Federalism Implications

The regulations herein will not have substantial direct effect on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Conclusion

For the reasons discussed in the preamble, and based on the findings in the Regulatory Flexibility Determination and the International Trade Impact Analysis, the FAA has determined that this final rule is not major under Executive Order 12291. The FAA certifies that this regulation could have a significant positive economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

The Amendments

Federal Aviation Administration amends 14 CFR Parts 21, 36, 43, 91, and 147 of the Federal Aviation Regulations effective December 31, 1992.

The authority citation for part 21 continues to read as follows:

Authority: 49 U.S.C. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2), 42 U.S.C. 7572; E.O. 11514; 49 U.S.C. 106(g).

Preamble 21-71

Alternative Noise Certification Procedure for Primary, Normal, Transport, and Restricted Category of Helicopters not Exceeding 6,000 Pounds Maximum Takeoff Weight

Adopted: September 11, 1992 Effective: September 11, 1992

(Published in 57 FR 42846, September 16, 1992)

SUMMARY: This final rule adds a new appendix to the noise standards regulations. The new appendix provides for an alternative noise certification procedure for primary, normal, transport, and restricted category helicopters not exceeding 6,000 pounds maximum takeoff weight. The new appendix is an optional alternative to existing helicopter noise requirements and is not an additional regulatory requirement. Applicants for certification may demonstrate compliance with the noise standards of either Appendix H or the less costly but more stringent new Appendix J. The new certification procedure is intended to provide regulatory relief to manufacturers of light helicopters

by substantially reducing the costs of demonstrating compliance with the noise regulations.

DATES: Effective September 11, 1992.

The incorporation by reference of certain publications listed in the rule is approved by the Director of the Federal Register as of September 16, 1992.

Comments must be submitted on this final rule on or before January 15, 1993.

ADDRESSES: Send comments on this final rule in triplicate to: Federal Aviation Administration, Office of the Chief Counsel,

Attn: Rules Docket (AGC-10), Docket No. 26910, 800 Independence Avenue SW, Washington DC 20591, or deliver comments in triplicate to: FAA Rules Docket, room 915G, 800 Independence Avenue SW, Washington DC. Comments may be inspected in room 915G between 8:30 a.m. and 5 p.m., weekdays, except Federal holidays.

FOR FURTHER INFORMATION CONTACT:

Mr. Kenneth E. Jones, Research and Engineering Branch (AEE-110), Technology Division, Office of Environment and Energy, FAA, 800 Independence Avenue, SW, Washington, D.C. 20591; telephone (202) 267-3554, facsimile (202) 267-5594.

SUPPLEMENTARY INFORMATION:

The purpose of this rulemaking is to add an alternative noise certification procedure to the existing requirements prescribed in the Federal Aviation Regulations (14 CFR Part 36). This amendment is based on Notice No. 92-7 (57 FR 28142, June 24, 1992; Docket No. 26910) in which comments were invited. All comments received were fully considered in the issuance of this Final Rule.

Additional Comments Invited

Interested persons are invited to participate in this rulemaking by submitting written data, views, or arguments and by commenting on the overall regulatory, environmental, energy, or economic aspects that might suggest a need to modify the rule. The additional comment period, subsequent to this publication of the final rule, is being initiated to accommodate requests for extension of the comment period for the Notice of Proposed Rulemaking (NPRM). Comments should identify the regulatory docket number (26910) and be submitted in triplicate to the address above. All comments received, as well as summaries of substantive public contact with Federal Aviation Administration (FAA) personnel on this rule will be filed in the docket, and will be considered by the Administrator. The docket is available for public inspection both before and after the closing date for

comments. The FAA will acknowledge the receipt of a comment if the commenter includes a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 26910." When the comment is received by the FAA, the postcard will be dated, time stamped, and returned to the commenter.

Background

Helicopter Noise Standards Development: FAA
On July 9, 1979, the FAA first addressed helicopter noise certification requirements by publishing an NPRM, Notice No. 79-13 (44 FR 42410). After consideration of the economic impact of the proposed rule, the NPRM was withdrawn (46 FR 61486, December 17, 1981). Because of advances in helicopter noise abatement technology, the FAA again initiated rulemaking and issued NPRM No. 86-3 (51 FR 7878, March 6, 1986), which resulted in the present helicopter noise certification standards, part 36, Appendix H (53 FR 3534, February 5, 1988). Appendix H was effective upon publication.

Data submitted recently to the ICAO by various helicopter manufacturers indicates that the cost of an Appendix H noise test for a light helicopter can range from $121,000 to $239,000. These figures do not include the substantial non-recurring costs for equipment and training. In addition, because the current rule requires that an applicant for a supplemental type certificate (STC) either demonstrate that the modified helicopter is no noisier than the original helicopter or perform a noise test, the costs associated with helicopter STC's have had an adverse effect on the development of helicopter modifications.

In the 1980's, the United States (in Appendix H) adopted a complex and comprehensive helicopter noise test procedure that was developed with the support of ICAO. During the development of the ICAO-recommended procedure for the original helicopter noise certification requirements, the relative cost and complexity of the proposed testing procedures were debated as a potential problem for manufacturers of small, low-cost helicopters. Because the majority of civil helicopters produced in the United States are exported, the unilateral adoption by the United States of an additional simplified noise certification procedure for light helicopters would have little practical benefits for the U.S. manufacturers without the adoption of a similar procedure by foreign countries that would make U.S.-manufactured helicopters acceptable to importing nations. Therefore, the United States and other members of ICAO addressed this issue by participating in the research and development of a simplified noise certification procedure with the support of ICAO. This final rule adopts a similar procedure to provide immediate regulatory relief to U.S. light helicopter manufacturers and modifiers in anticipation of the formal adoption of the standards proposed by ICAO.

Helicopter Standards Development: ICAO

The current ICAO helicopter noise standards (Chapter 8, Annex 16) parallel those of Appendix H. When ICAO adopted its helicopter noise standards in 1985, it recognized that a simpler flight test procedure was needed for lighter helicopters. Accordingly, the ICAO committee responsible for formulating noise certification standards, the Committee on Aviation Environmental Protection (CAEP), formed a working group and charged it with the development of a new standard applicable to light helicopters. The product of the working group's efforts, an alternative noise certification procedure for piston-powered helicopters, was amended at the request of the United States during the most recent CAEP meeting (December 1991) to include turbine-powered helicopters and to establish the maximum weight at 6,000 pounds. Compared to the current ICAO standard (Chapter 8), the new ICAO Chapter 11 standard will: (1) change the noise metric from Effective Perceived Noise Level (EPNL) to Sound Exposure Level (SEL); (2) reduce the required microphone locations from three to one; (3) require only a level flyover test instead of level flyover, approach, and takeoff tests; and (4) reduce the complexity of the data corrections procedures. However, these changes make it impossible to set a limit that is equally stringent for all helicopters. For this reason, it was undesirable to attempt to develop a replacement standard for the existing ICAO Chapter 8 standard. Thus, the CAEP decided to develop an alternative standard (ICAO Chapter 11) that is simpler to perform, but that has an SEL limit that is more stringent (by two decibels) than the current ICAO Chapter 8 EPNL limit. After an extensive analysis of existing data, the CAEP set the Chapter 11 SEL limit such that it is unlikely that an applicant would pass the newly recommended ICAO Chapter 11 standard and yet fail a full ICAO Chapter 8 test if the Chapter 8 test were also performed.

The new ICAO Chapter 11 standard was approved by the CAEP during its December 1991 meeting in Montreal, Canada. The CAEP approval was the major hurdle facing the new ICAO standard. Before formal adoption, the CAEP recommendations must be submitted to the ICAO Council, which in turn will send them to ICAO member States for comment. If member States unanimously concur, the Council will issue the recommended standard. If member States do not concur, the Council will refer the issue to the ICAO Air Navigation Commission (ANC) along with member States' comments. The ANC will review the CAEP recommendations and member States' comments, and make recommendations to the Council, which in turn will send the revisions back to the member States for approval. The ICAO staff estimates that the new ICAO Chapter 11 will be formally adopted in November 1993.

Synopsis of the Rule

Part 36 of the Federal Aviation Regulations (14 CFR) contains noise standards for aircraft type and airworthiness certification. Subpart H and the related Appendix H prescribe

noise levels and test procedures for civil helicopters certificated in the primary, normal, transport, or restricted category, including rules governing the issuance of original, amended, or supplemental type certificates for helicopters for which application is made on or after March 6, 1986.

This final rule adds and reserves a new Appendix I, and adds a new Appendix J to part 36. It also amends subpart H of part 36 to incorporate the requirements of the new Appendix J. The amendments to subpart H and the new requirements of Appendix J do not represent additional regulatory requirements, but rather provide an alternative helicopter noise certification procedure for light helicopters that complements the existing helicopter noise test requirements of Appendix H. The term "light helicopters" as used in this preamble refers to helicopters in the primary, normal, transport, or restricted category not exceeding 6,000 pounds maximum certificated takeoff weight. Compared to the existing Appendix H requirements, the test procedures of Appendix J are simpler and less costly, but more stringent relative to the existing noise limits under Appendix H. An applicant has the option of certificating a light helicopter under Appendix H or the new, less costly but more stringent Appendix J. The noise limits prescribed under Appendix J are, on the average, two decibels more stringent than the noise limits prescribed under Appendix H. If an applicant fails the more stringent limits prescribed under Appendix J, the applicant would be able to apply for certification under the existing requirements prescribed under Appendix H. The need for this optional certification standard is based on the unanticipated and disproportionate costs to small helicopter manufacturers that are associated with the testing requirements of Appendix H.

The following is a section-by-section discussion of the final rule.

Section 21.115 Applicable requirements.

This section sets forth the airworthiness, noise, and fuel

venting and exhaust emissions requirements that must be met by each applicant for a supplemental type certificate. Section 21.115(a) is amended to reinstate a reference to the noise requirements of 14 CFR Part 36. This reference was inadvertently removed in recent rulemaking.

Appendix J to Part 36

Part 36 is amended by adding a new Appendix J. Appendix J provides an alternative noise certification procedure for certain civil helicopters certificated in the primary, normal, transport, or restricted category.

Appendix J follows the general outline and all applicable definitions, technical specifications, reference conditions, reference flight procedures, and the specific language of the

existing Appendix H on a section-by-section basis. Appendix J provides a high degree of commonality between U.S. standards and those expected to be adopted by ICAO and other ICAO member countries. However, subsequent to development of the specifications for the ICAO Chapter 11 standard, three technical issues of significance were identified by the FAA, that have led to differences between Appendix J and the ICAO Chapter 11 test standards that are presently proposed. After review of these issues, the FAA found the potential errors associated with them to be excessive and contrary to the agency's expectations regarding the accuracy and integrity of the aircraft noise certification process. The three issues are discussed below.

As proposed, Chapter 11 does not provide for a correction of off-reference conditions (in particular, ambient temperature) regarding the mechanical generation of noise at its source during the flyover test procedure. Noise levels generated by a typical helicopter vary as a function of rotor tip speed and the speed of sound. Since the speed of sound varies as a function of ambient temperature, helicopter noise levels will also vary as a function of ambient temperature. Appendix J and Chapter 11 require the measurement of noise levels at, or corrected to, the reference ambient temperature of 77 degrees Fahrenheit. At temperatures above the reference, the helicopter noise generated at the source is less than the noise generated at the reference temperature. At temperatures less than the reference, the noise generated is correspondingly greater than at reference conditions. The FAA's solution to the off-reference generation of noise caused by off-reference temperature is to require an adjustment to the reference airspeed so the helicopter is flown at the reference advancing blade tip Mach number. Such a calculated adjustment to the reference airspeed will be made just prior to the actual flight test, and will account for the ambient temperature at the time of the test. This is the procedure proposed by the International Coordinating Council of the Aerospace Industries Association in their working paper WP/48 presented at the recent CAEP meeting in Montreal (December 1991). A copy of working paper WP/48 is included in the docket.

Chapter 11 also does not provide for a correction of off-reference atmospheric attenuation. The FAA's solution to the error caused by failure to correct for off-reference atmospheric attenuation is to reduce the size of the test window prescribed under section J36.101(c) to preclude testing in the portion of the temperature and relative humidity test window where high rates of atmospheric absorption are encountered. By restricting the test window, any error caused by off-reference atmospheric absorption is reduced, and the need for correction is negated.

The FAA's third concern is the Chapter 11 provision allowing the use of a strip chart recorder and an "estimation" equation to determine SEL from the duration and the maximum A-weighted level of the noise trace. During development of the NPRM, the FAA examined data from numerous helicopter noise tests which indicated that the error introduced by the strip chart method

ranged from zero to 1.7 decibels when compared with helicopter noise measured and analyzed by the Appendix H procedure. The error did not favor the applicant in any of the data. Accordingly, the NPRM did not include the strip chart method as one of the allowable measurement methods specified under proposed section J36.109(d). As proposed, Appendix J would have allowed the use of an integrating sound level meter to directly measure the SEL during the flyover, or the helicopter flyover noise signal could be tape recorded for subsequent analysis by an integrating sound level meter.

After further consideration of this issue subsequent to issuance of the NPRM, the FAA has decided to permit the use of a strip chart recorder and an "estimation" equation as an optional method of calculating SEL from maximum level and duration readings taken from the strip chart trace. This change is made in the interest of harmonizing Appendix J and ICAO Chapter 11. The addition of the strip chart method as an optional measurement method has no impact on any other provision of Appendix J. Since the amount of error, if any, is unpredictable from helicopter to helicopter, the consequence of the use of the strip chart method relative to the other measurement methods is also unpredictable. However, since the FAA's data indicate that any error from the strip chart method works against applicants, the FAA advises all applicants wishing to use such a procedure that errors are possible, and suggests that the applicants choose one of the other SEL-measurement methods specified under Appendix J. The strip chart method involves the use of a strip chart recorder and equations for calculating SEL from the time-history trace recorded on the strip chart. Accordingly, section J36.109(d)(1) includes the strip chart recorder as an optional measurement method. Further, a new section J36.109(b)(5) is added to the final rule to incorporate the equations necessary to calculate the SEL from the strip chart trace.

Appendix H has a provision that allows less stringent limits, i.e., Stage 2 plus 2 EPNdB, for acoustical changes for Stage 1 helicopters, and a provision that allows similar less stringent limits for the first civil version of a military helicopter. In the interest of harmonizing the U. S. and ICAO helicopter noise certification regulations, these provisions were not included in the proposed rule. The practical effect of not including these provisions is that certain older helicopters will not have the benefit of the more liberal noise limits allowed under Appendix H.

With the adoption of Appendix J, applicants have a choice of two noise certification procedures for certain helicopters. An analysis performed to demonstrate a "no acoustic change" must assume that either Appendix H or Appendix J is the noise certification basis of the parent helicopter. For the purpose of demonstrating "no acoustic change" under Section 21.93(b), the demonstration must be consistent with the noise certification basis of the parent helicopter. Thus, if the parent helicopter is certificated under part 36, Appendix H, the "no acoustic

change" analysis must consider all three flight configurations (flyover, approach, takeoff). If the parent is certificated under part 36, Appendix J, the "no acoustic change" analysis is limited to consideration of flyover noise levels. If the parent helicopter is a Stage 1 helicopter, the noise certification basis of the parent helicopter is under Appendix H. Subject to the approval of the FAA, the noise certification basis of a Stage 2 helicopter having a maximum certificated takeoff weight of not more than 6,000 pounds may be changed from Appendix H to Appendix J through an FAA-approved reanalysis of the original Appendix H noise test data for that helicopter, or by retesting that helicopter under the requirements of Appendix J. Helicopters that are noise certificated under Appendix J can be converted to Appendix H noise certification only by performing the noise tests prescribed under Appendix H.

Sections 36.1, 36.6, 36.801, 36.805, and 36.1581 are also amended to add a reference the alternative noise certification procedure contained in the new Appendix J.

Discussion of Comments:

Interested persons were afforded the opportunity to participate in development of this rulemaking by submitting written comments to the public regulatory docket on or before July 6, 1992. All comments received have been reviewed and duly considered in promulgating this amendment; comments received after July 6, 1992, have been considered to the extent possible without delaying this rulemaking action. Seven comments were received; two from individuals, two from helicopter industry groups, and three from a foreign civil aviation authority.

Three requests for an extension of the comment period were received by the FAA. The FAA considered these requests and determined that any further delay in the issuance of this rule would result in an undue burden on U.S. manufacturers of light helicopters and would be contrary to the public interest. However, the FAA has determined that the interests of all affected persons will best be served by establishing a time during which comments on this final rule will be considered. At the conclusion of this comment period, the FAA will, if appropriate, take action to amend this rule.

One commenter suggests that use of the parenthetical phrase "(internal load)" is inappropriate and does not convey the proper intent as proposed in section J36.3(d) in prescribing the reference helicopter weight at which the noise tests are to be performed. The FAA agrees and offers the following discussion to clarify the matter. The maximum certificated takeoff weight to be used for noise certification purposes is the "maximum weight" defined under Section 27.25(a) or Section 29.25(a) of this chapter unless the applicant chooses a lesser noise certification weight and complies with any associated restrictions. If the applicant chooses to conduct the noise certification tests at a weight less than the maximum weight established under

Section 27.25(a) or Section 29.25(a), then as prescribed under Section 36.1581, that lesser weight must be furnished as an operating limitation in the operating limitations section of the Rotorcraft Flight Manual, in FAA-approved manual material, or on an FAA-approved placard. Alternatively, in anticipation of future changes in type design involving a change in weight, an applicant may choose to conduct supplemental flight tests to establish a sensitivity curve of noise versus weight whereby a noise certification level can be calculated, through interpolation, for the change in type design and the associated maximum weight. It is not the intent of the FAA to require noise certification testing at the weight defined under Section 27.25(c) or Section 29.25(c), "total weight with jettisonable external load." The effort in the NPRM to qualify the noise certification weight by the parenthetical phrase "(internal load)" in section J36.3(d) was found to be confusing and is not adopted in the final rule.

A commenter requests FAA guidance on supplemental noise flight testing to develop noise versus drag data in anticipation of future changes in type design involving the addition (or removal) of aerodynamically-significant optional external devices. Appendix J does not require supplemental noise flight testing. Requests for supplemental testing will be considered by the FAA under the equivalent procedure provision of Section 36.801. The same commenter also suggests that the helicopter should be tested in a clean configuration and that all future changes in type design involving the addition of external drag-inducing attachments should be exempted from the acoustic change provisions prescribed under Section 21.93(b) of this chapter. The FAA will study this suggestion for a future rulemaking action; however, the suggestion is outside the scope of this rulemaking action.

Three commenters note the difference in height (above ground) between the relative humidity and temperature measurement locations as prescribed in the NPRM, and recommend that the measurements be made at the same height. The FAA agrees that such measurements, which are used to determine absolute humidity by the off-reference atmospheric attenuation correction method of Aerospace Recommended Practice 866A, should be made at the same location and the same height above the ground. The FAA agrees that the temperature, relative humidity, and wind speed and direction measurements should be made between the heights of 4 feet and 33 feet. This provision will ensure that an applicant can make one set of meteorological measurements that will satisfy the requirements of Appendix J and of ICAO Chapter 11. Section J36.101(c)(4) is adopted with the change noted above.

Several commenters suggest that the temperature and relative humidity test window proposed in section J36.101(c) be reduced in size to eliminate testing under highly absorptive regions of the test window. In a related suggestion, if the temperature and

relative humidity test window is reduced in size, they suggest

the adoption of a "zero correction window" over the remaining portion of the reduced temperature and relative humidity test window where correction for off-reference atmospheric attenuation would not be required. Such a "zero correction window" would be achieved by eliminating the requirement for correction of off-reference atmospheric attenuation proposed in section J36.113 and by eliminating the procedures for performing the correction of off-reference atmospheric attenuation proposed in section J36.205(c). The FAA agrees. The commenters differ slightly in the amount of reduction they recommend in the size of the test window. The final rule adopts the test window proposed in section J36.101(c) with the added requirement that testing may not take place where combinations of temperature and relative humidity would result in a rate of atmospheric attenuation greater than 10 dB per 100 meters (30.5 dB per 1000 ft) in the one-third octave band centered at 8 kiloHertz. With the test window atmospheric attenuation is reduced and the need for correction is negated. These changes further serve to harmonize Appendix J with Chapter 11 and are adopted in anticipation of a similar restriction in the test window being adopted by ICAO member States during individual implementation of the Chapter 11 standards. Proposed section J36.113, which prescribed the requirement for off-reference atmospheric attenuation correction, is not adopted. Proposed section J36.205(c), which prescribed the procedures for the correction of off-reference atmospheric attenuation, is not adopted. Proposed section J36.101(c)(2), which prescribes the temperature and relative humidity test window, is adopted with the change noted above.

One commenter submits data demonstrating the adverse impact of anomalous conditions in temperature and relative humidity vertical profiles on the accuracy of the noise test results. The commenter suggests that proposed section J36.101(c)(6) be changed to add the phrase "other anomalous meteorological conditions" to the weather restrictions prescribed under that section. The FAA agrees. The commenter is correct that the air temperature measured at the reference altitude, which is required elsewhere in the test procedure, will provide sufficient information for test personnel to detect the presence of an anomalous conditions along the noise propagation path. The FAA also agrees with the commenter that the proposed change is consistent with the requirements of ICAO Chapter 11. Proposed section J36.101(c)(6), which is redesignated as section J36.101(c)(5) in the final rule, is adopted with the changes noted.

Two commenters suggest a clarification in the language describing the number and direction of the test flyovers in proposed section J36.105(b) to explicitly require flyovers in equal numbers in opposite directions so that the helicopter is tested with both headwind and tailwind components when winds aloft are present. The FAA agrees. The intent of the proposed provision is to nullify the effect of off-reference ground speed caused by winds aloft on the average noise level calculated from the individual noise levels of each flyover event. A test helicopter flying along the established reference flight path

with a tailwind will experience an increase in the flyover velocity relative to the noise measurement position, thus reducing the acoustical duration of the flyover and lowering the measured SEL value. Conversely, if the helicopter is flown in the opposite direction with a headwind under the same meteorological conditions, lowering the groundspeed and increasing acoustical duration, the consequent increase in the measured SEL value caused by the headwind should numerically offset the opposite effects caused by the tailwind. By requiring equal numbers of flights in opposite directions, correcting individual flyovers for off-reference groundspeed is not necessary. Proposed section J36.105(b) is adopted with the suggested clarification. However, one of the commenters notes that applicants should be aware that, although Appendix J does not require the measurement of ground speed and the correction of off-reference ground speed for individual flyovers, failure to correct the individual flyovers for off-reference groundspeed can adversely affect the number of flyovers required to establish statistically a 90 percent confidence limit that does not exceed +/- 1.5 dB(A) as prescribed under section J36.203(b). An applicant may elect to measure groundspeed during the flyovers and correct for off-reference groundspeed in order to improve the confidence limit under the provisions of section J36.205(e) which simply states that such measurements and corrections are not required. Such measurement and correction procedures would require FAA approval. In a similar manner, applicants may perform the necessary measurements and apply corrections for off-reference source noise and atmospheric attenuations as permitted in section J36.205(d) and section J36.205(f), respectively.

One commenter states that any differences between Appendix J and ICAO Chapter 11 would be economically burdensome because industry will have to test to two different procedures. The FAA disagrees. One of the basic criteria used by the FAA in developing Appendix J was that any additional or different Appendix J requirements would impose little or no additional costs on the applicant when compared to Chapter 11 requirements. Appendix J differs from Chapter 11 in two procedures. Appendix J has a temperature and relative humidity test window that is smaller than the test window allowed in Chapter 11, and Appendix J requires testing at an adjusted reference airspeed to offset the effects of off-reference source noise; Chapter 11 does not require that applicants make a similar adjustment. Foreign certification authorities have expressed their general acceptance of the adjusted reference airspeed procedure required under Appendix J as an equivalency to the procedure prescribed under Chapter 11. The smaller temperature and relative humidity test window in Appendix J, or a similar restriction, is expected to be adopted by other ICAO countries. In the worst-case scenario where an applicant is required to test at two airspeeds to satisfy different certificating authorities, the addition of six additional flyovers during a certification test is not considered a significant technical, logistical, or economic challenge. The FAA concludes that these additional requirements do not involve a significant economic burden.

One commenter states that although the adjustment process in section J36.105(c)(1) for source noise variation is based on the tip speed of the main rotor blades, the main rotor system may not be the primary source of noise for a given helicopter, leading to substantial inaccuracies in the measurement procedure. The FAA disagrees. The actual source of noise is irrelevant to the correction process. This is an issue common to an Appendix H test as well. For a typical noise certification test, the relative noise levels produced by various sources of noise on a given helicopter will not be known accurately, nor is it necessary for the dominant source to be known. Since the RPM of the rotor system is a fixed value and ambient temperature is an uncontrolled variable, what is really measured by source noise sensitivity testing is helicopter noise versus airspeed as adjusted to a reference temperature, not main rotor, tail rotor, or engine noise versus tip speed. If, for example, a piston helicopter is entirely dominated by exhaust noise, the peak helicopter noise will be insensitive to changes in main rotor tip speed (and helicopter airspeed). Under Appendix J, any change in the SEL caused by the change in duration from the difference between reference and adjusted reference airspeeds is corrected by the mandatory <delta J3> correction. Thus, it is not necessary to account for the dominant source of noise for a given helicopter for purposes of correction of the effects of off-reference source noise.

In the worst-case situation where source noise is entirely independent of airspeed, RPM, or ambient temperature, the mandatory procedure for addressing off-reference source noise will have no net effect on the measured noise levels. In all other situations, the procedure will improve the accuracy of the test procedure. However, knowledge of the dominant source of noise would be important under Appendix H and Appendix J when an applicant for a change in type design alters the helicopter noise source(s) (i.e., blade diameter, RPM, etc.) and wishes to use the source noise sensitivity curves previously measured under Appendix H, or measured as an option under Appendix J, during the noise testing of the parent helicopter. In a related comment, one commenter states that the term "translational speed" as used in the calculation of advancing blade tip Mach number under section J36.105(c)(1)(i) is inappropriate and should be replaced with "true air speed". The FAA agrees that the terminology "true air speed" is more descriptive of the actual airspeed required in the calculation, and section J36.105(c)(1)(i) is adopted with the change as noted. The remainder of section J36.105(c)(1) is adopted as proposed.

One commenter requests a 3 dB reduction in the maximum allowable noise levels prescribed by section J36.305(a). The commenter states that the increase in maximum allowable noise levels proposed in ICAO Chapter 11 over the maximum allowable noise levels contained in ICAO Chapter 8, and consequently, Appendix J over Appendix H, accounts for small inaccuracies inherent in the simplification process, and that such

inaccuracies are removed by the addition of adjustment procedures for the effects of off-reference ambient temperature on source noise and off-reference temperature and relative humidity on atmospheric attenuation. The FAA disagrees. These limits are not based on a perceived inaccuracy incurred as a result of not providing for a correction for the effects of off-reference relative humidity and/or temperature on source noise and atmospheric attenuation. The process used to establish the maximum allowable noise levels were based entirely on fundamental differences between the SEL and EPNL metrics, and the helicopter-to-helicopter variation in the relationship between: (1) SEL and EPNL; (2) the centerline noise level and the average of the noise levels from three microphone locations; and (3) flyover noise levels and the relative noise levels from the flyover, approach, and takeoff test procedures. Accordingly, section J36.305(a) is adopted as proposed.

One commenter states that the +/-3 knot limit on airspeed variation is too restrictive operationally and suggests an alternative specification. The FAA disagrees. Appendix J prescribes a +/-3 knot airspeed specification under section J36.105(c)(1)(ii) as opposed to the +/-5 knot specification in Appendix H under section H36.105(d). However, Appendix H has a requirement for an adjustment for off-reference airspeed under section H36.205(e). Appendix J does not have a similar requirement. Therefore, Appendix J requires a more restrictive limitation on variation in airspeed to minimize any error that might occur from the absence of a correction for off-reference airspeed. However, the FAA will consider an alternative specification as an equivalent procedure if the alternative specification provides a mechanism for ensuring that the average of the noise levels from the individual flyovers is representative of the noise level measured at reference airspeed conditions. Chapter 11 also has a +/-3 knot airspeed requirement. Accordingly, section J36.105(c)(1)(ii) is adopted as proposed.

One commenter states that a sound level meter will: (1) result in a longer "10 dB down" duration time than would Appendix H, which will increase the SEL; and (2) sample a wider frequency spectrum than otherwise required under Appendix H using the 24 contiguous one-third octave bands. The FAA agrees that the skill of the sound level meter operator in starting and stopping the integration at the precise 10 dB down points in the time history may have some small effect on the SEL value. The FAA reviewed data from recent helicopter noise research tests to assess the influence of the difference between the spectral width sampled by a sound level meter and that sampled using the Appendix H data reduction procedure. The net SEL difference between the two procedures for twelve helicopter certification-type noise tests was found to be zero.

Two commenters request changes to or clarification of the requirement under section J36.111(b)(6) that helicopter speed, position, and engine performance data be recorded at an FAA-

approved sampling rate. The FAA agrees. Section J36.111(b)(6) has been rewritten to better define the requirement. The phrase "FAA-approved sampling rate" is consistent with the requirements of ICAO Chapter 11 and Appendix H and recognizes that an appropriate sampling rate for a given parameter may depend on the equipment, operators, and procedures employed by the applicant. The requirement that the parameters must be "recorded" does not necessarily imply that electronic data recording systems must be used. For many of the parameters, an FAA-approved cockpit observer may scan the appropriate instrumentation throughout the measured portion of the flyover and record the data by hand. The observer may note the lateral position of the helicopter relative to ground markers to ensure that the helicopter stays within the prescribed limits for lateral deviation. Audio cassette recorders and video camcorders may be useful to augment a cockpit observer. The section is adopted with the change noted.

One commenter states that an inconsistency exists between Appendix J and Appendix H regarding the definition of the reference rotor RPM, and recommends that the word "maximum" (corresponding to the top of the green arc on the rotor tachometer) be added to the prescribed rotor operating condition prescribed under sections J36.3(c) and J36.105(c)(2). The FAA agrees. Sections J36.3(c) and J36.105(c)(2) are adopted with the change noted above.

One commenter states that the data adjustment limitation of 2 dB under proposed section J36.205(g) is too restrictive given the possibility that the correction for off-reference atmospheric absorption can alone approach this limit, and recommends that the restriction be eliminated. Although the requirement for correction of off-reference atmospheric absorption was not adopted in the final rule, the comment is still valid and the FAA agrees in part. The final rule retains the 2 dB limitation, but changes the applicability of the restriction to only those corrections made to account for the differences between test and reference flight procedures prescribed under section J36.105. The change also brings the restriction in Appendix J into harmony with the similar restriction in ICAO Chapter 11. Section J36.205(g) is adopted with the change noted above.

One commenter states that the requirement of section J36.109(e)(2)(i) to calibrate the noise measurement system at intervals not exceeding one hour is unnecessarily restrictive, and recommends a 1.5 to 2 hour maximum interval as more appropriate. The FAA disagrees. Experience has shown that the one-hour restriction is not a hindrance to the orderly conduct of the flight test. The time necessary to perform a required calibration is at most a few minutes for a tape recording system and even less for a sound level meter. The ICAO Chapter 11 requires such calibrations before the start of testing and at intervals during the test. Unless substantial complications occur or the applicant extends the test to perform additional supplemental tests, the entire test series prescribed

under this rule can be performed in less than one hour. Good engineering practice, in general, dictates frequent equipment calibration at available opportunities in order to monitor equipment performance. Accordingly, section J36.109(e)(2)(i) is adopted as proposed.

In proposed section J36.109(d), the FAA proposed to retain the discretion to require the applicant to tape record the noise signal from the flyover tests. This proposed provision is consistent with a similar requirement in ICAO Chapter 11. The FAA intended to reserve the authority to require such recordings as an auditing procedure for a given test and for maintaining the integrity of the overall helicopter certification process by auditing the application of the rule and monitoring the rule's efficacy as a representative test for unusual and previously (acoustically) untested helicopter design configurations. One commenter requests that this provision be deleted, and that application criteria be provided if the provision is retained. After further consideration, the FAA has determined that the development of uniform and equitable application criteria across the broad spectrum of potential applicants is not practicable. Accordingly, the FAA agrees that the proposed provision should be deleted in the final rule. However, the FAA retains the authority to perform acoustic measurements and recordings in parallel with the applicant during a noise test conducted for the purpose of demonstrating compliance with this rule. The FAA also retains the authority to independently review all recorded data, including the tape recorded helicopter flyover noise if recorded by the applicant. The proposed section J36.109(d)(1) is adopted with the change noted above and, as previously discussed in this preamble, with the added provision that a strip chart recorder may be used as one of the methods to measure the helicopter flyover noise.

One commenter suggests adding a requirement that multi-engine helicopters be tested with all engines operating at approximately the same power. The FAA agrees that this is an important factor and will consider it for further rulemaking, since such a requirement was not proposed in the NPRM. Accordingly, section J36.105(c)(3) is adopted as proposed.

No comments were received on the NPRM concerning the form of the equation for calculating the allowable noise limit in section J36.301. The proposed equation follows the general form of the equations incorporated in the ICAO aircraft noise standards. However, the FAA has previously published equations for part 36 noise limits in Advisory Circular 36.1 that are different in form from their ICAO counterparts. The FAA inadvertantly overlooked the published FAA equations during the development of the NPRM. After further consideration, the FAA has changed the form of the proposed equation in section J36.301 to coincide with the general equation form used in the other appendixes of this part as presented in FAA Advisory Circular 36.1. The slight difference in the form of the FAA equations and the form of the ICAO equations may be the subject of future

discussions regarding the harmonization of the FAA rules and the ICAO standards. However, the FAA does not wish to pursue the harmonization issue on a piecemeal basis. The maximum difference between the equation proposed in the NPRM and the equation adopted in the final rule is 0.0005 dB, which occurs at 6,000 pounds.

Proposed section J36.105(d) includes the Appendix H requirement that "at least one flyover test in the flyover test series must be conducted at a test weight at or above the maximum takeoff weight for which certification under this part is requested." No comments were received on this proposed requirement. However, after further consideration, the FAA has not adopted this requirement in the final rule. This change is made in the interest of harmonizing the requirements of Appendix J with the requirements of ICAO Chapter 11. Deleting this requirement in the final rule does not adversely affect the conduct of the test and does not diminish the integrity of the rule. The affected section retains the requirement that the helicopter test weight for each flyover must be within plus 5 percent or minus 10 percent of the maximum takeoff weight. However, applicants should understand that the deviations allowed under section J36.105 from reference test conditions must be random. An applicant will not be permitted to deliberately abuse the allowable random deviations prescribed in section J36.105 to artificially lower the noise levels measured during the flyover test. The proposed section J36.105(d) is adopted with the change noted above.

Regulatory Evaluation Summary

This section summarizes the regulatory evaluation prepared by the FAA on the amendments to 14 CFR part 36 - Noise Standards: Aircraft Type and Airworthiness Certification. This **SUMMARY** and the full regulatory evaluation quantify, to the extent practicable, estimated costs to manufacturers, modifiers, and Federal, State, and local governments, as well as anticipated benefits.

Executive Order 12291, February 17, 1981, directs federal agencies to promulgate new regulations or modify existing regulations only if potential benefits to society for each regulatory change outweigh potential costs. The Executive Order requires the preparation of a Regulatory Impact Analysis of all "major" rules except those responding to emergency situations or other narrowly defined exigencies. A "major" rule is one that is likely to result in an annual effect on the economy of $100 million or more, that is likely to result in a major increase in consumer costs, that has a significant adverse effect on competition, or that is highly controversial.

The FAA has determined that this final rule is not "major" as defined in the Executive Order; therefore, a full regulatory impact analysis that includes the identification and evaluation

of cost-reducing alternatives to this rule has not been prepared. Instead, the agency has prepared a more concise document termed a regulatory evaluation that analyzes only this final rule without identifying alternatives. In addition to a **SUMMARY** of the regulatory evaluation, this section also contains a Regulatory Flexibility Determination required by the Regulatory Flexibility Act of 1980 (5 U.S.C. 601 et seq.) and an International Trade Impact Assessment. If more detailed information is desired, the reader may examine the full regulatory evaluation contained in the docket.

Under this final rule, an applicant seeking certification of a light helicopter will be permitted to choose between two noise certification procedures: Appendix H or Appendix J. The new noise certification procedure, Appendix J, will (1) reduce the required microphone locations from three to one; (2) require only a level flyover test rather than level flyover, approach, and takeoff tests as in Appendix H; and (3) reduce the complexity of the data correction procedures. Compared to Appendix H, each of these three factors will lower compliance costs.

Benefit Analysis

The FAA has determined that this final rule will accommodate the advancement of the helicopter manufacturing industry by reducing compliance costs and improving relationships among manufacturers, modifiers, and operators of helicopters, while providing a potential for a reduced level of noise. The following is a discussion of the benefits, including reduced compliance costs, that will accrue as a result of this final rule.

The Appendix J noise certification procedure will create a commonality with international standards. The International Civil Aviation Organization (ICAO), Committee on Aviation Environmental Protection, met in December of 1991 in Montreal, Canada, and recommended noise certification standards for light helicopters that are very similar to the U.S certification procedures contained in this final rule.

In July 1991, the FAA conducted a series of acoustic flight tests of 12 helicopter configurations in order to supplement an existing light helicopter noise data base of seven helicopter models. An analysis of the 19 helicopter tests resulted in the establishment of an SEL-based limit under Appendix J that is, on average, 2.0 dB more stringent than the limit each of the 19 helicopters would have to meet under Appendix H.

The more stringent noise certification requirements may foster better relationships between the airports, heliports, local communities, and helicopter operators by providing the potential for quieter helicopters. In some instances, local communities have opposed the establishment of nearby heliports. For example, a zoning request for a heliport to be located just

outside of Washington, DC, was denied in the mid-to-late 1980's. Excessive noise was cited as one reason for not granting this request.

In recent years, the number of heliports, helistops, and helipads at airports has increased. In 1987, there were 3,325 heliports in the United States; by the end of 1990, that number had increased to 4,462. As the number of heliports has grown, so has the U.S. helicopter fleet. The FAA estimates that the new alternative procedure will encourage manufacturers to comply with the substantially less costly but more stringent Appendix J requirements, and therefore may result in the manufacture of quieter light helicopters.

In addition to providing for a reduced level of noise, the FAA estimates that the manufacturers of light helicopters will have lower one-time noise certification procedure costs. These savings include those primarily associated with the noise abatement technology. The present value cost savings to helicopter manufacturers will be about $5.43 million over the next 15 years.

A helicopter modifier may concentrate on a particular type of aircraft, and that entity may be in the business of continually developing, selling, and installing modification kits for a particular type of aircraft. The present value cost savings to helicopter modifiers will be $17.01 million over the next 15 years. The FAA has examined the impact that this final rule will have on helicopter operators, and concludes that there will be no impact on helicopter operators. In addition, the FAA estimates that the agency will have lower costs because less labor will be required to process and witness the new test procedure. On a per-certificate basis, the annual cost savings to the FAA will be about $12,300. The present value cost savings to the FAA is estimated to be $1.78 million over the next 15 years.

International Trade Impact Analysis

The final rule will have little or no impact on trade for either U.S. firms doing business in foreign countries, or foreign firms doing business in the United States. In the U.S. market, foreign manufacturers will have the option of producing helicopters that satisfy the new standards and, therefore, will not be at a competitive disadvantage with U.S. manufacturers.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 requires agencies to review rules that have "a significant economic impact on substantial number of small entities". The FAA's criteria for "a substantial number" is a number that is not less than 11 and that is more than one-third of the small entities subject to this final rule.

According to FAA Order 2100.14A, "Regulatory Flexibility Criteria and Guidance," the definition of a small entity (aircraft and aircraft parts manufacturer) is one with 75 or fewer employees. There are no small U.S. helicopter manufacturers that are manufacturing helicopters for the U.S. market.

Although FAA Order 2100.14A does not specifically identify the aircraft modifiers affected by this rulemaking as an entity type in its lists of threshold criteria, an "aircraft repair facilities" entity is listed in the order. This entity would include repair stations certificated and rated under 14 CFR part 145 and shops employing persons who are holders of a mechanic or repairman certificate issued under 14 CFR part 65 that deal with helicopters. Mechanics employed by such entities may perform maintenance, preventative maintenance, and alteration work as prescribed by Section 43.3 of 14 CFR part 43. The corresponding size threshold given in the order is 200 employees.

An aircraft modifier conducts engineering and supplemental type certificate application activities, and typically performs the alteration work. A modifier also may separately offer repair or maintenance services. The nature of the work performed by a modifier is generally analogous to that of an aircraft repair facility, and the corresponding threshold levels given in the order are assumed to apply here. For the purpose of this regulatory flexibility determination, an aircraft modifier is considered a small entity if it has 200 or fewer employees.

The Order does not define a threshold value for significant annualized cost for the aircraft repair facilities entity. The FAA estimates that the annualized 1991 cost threshold is $5,400.

Based upon information presented in the cost analysis, the one-time cost savings to a small modifier will be about $155,290 per supplemental type certificate.
Annualized at 10 percent over 10 years, the cost savings will be $27,270. This is above the annualized cost threshold.

The total population of modifiers is about 200, and in recent years, about 75 of them have applied for supplemental type certificates which require a noise test under 14 CFR part 36. Typically, between 10 to 12 modifiers would initiate a change annually. Using the lower population estimate, about 16 percent (12/75 = 0.16) of the total population of rotorcraft modifiers would be affected annually.

The FAA concludes that a substantial number of small entities (more than one third) are not affected significantly by this final rule. Therefore, the final rule would not impose a significant economic impact on a substantial number of small entities, and thus, a regulatory flexibility analysis is not required.

Federalism Implications

The regulations adopted herein do not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Environmental Analysis

The procedures implemented by this rule have been determined to not significantly affect the quality of the human environment. Pursuant to the Department of Transportation "Policies and

Procedures for Considering Environmental Impacts" (FAA Order 1050.1D), a Finding of No Significant Impact has been prepared and placed in the docket.

Justification for Immediate Adoption

The FAA has determined that further delay in the adoption of this rule would cause undue burden to U.S. manufacturers of light helicopters. Many U.S. manufacturers of light helicopters have new type certification projects that are nearing completion. These certification actions will require noise testing. These manufacturers have participated in and supported the establishment of the ICAO standards similar to those adopted here. Without this rule, these U.S. manufacturers must comply with the more costly testing requirements of Appendix H of this chapter. Accordingly, the FAA has determined that good cause exists to make this rule effective in less than 30 days.

Interested persons are invited to submit comments as they may desire regarding this amendment. Communications should identify the docket number and be submitted in triplicate to the address above. All communications received on or before the close of the comment period will be considered by the Administrator. Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the rule that might suggest a need to modify the rule. After review of the comments, if the FAA finds that changes are appropriate, it will initiate rulemaking proceedings to amend the regulations. All comments will be available, both before and after the closing date for comments, in the Rules Docket for examination by interested parties.

Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this rule must submit a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket Number." The postcard will be date stamped and returned to the commenter.

Because of the substantial public interest in this rule

noted above, the FAA has determined that this rule is significant under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979).

Conclusion

For the reasons stated above, I certify that this final rule: (1) is not a major rule under Executive Order 12291; (2) is a significant rule under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) does not have a significant economic impact on a substantial number of small entities. In addition, this final rule has little or no impact on trade opportunities for U.S. firms doing business overseas, or on foreign firms doing business in the United States.

The Amendments

Accordingly, the Federal Aviation Administration amends 14 CFR parts 21 and 36 of the Federal Aviation Regulations as follows:

Part 21 -- CERTIFICATION PROCEDURES FOR PRODUCTS AND PARTS

The authority citation for part 21 is revised to read as follows:

Authority: 49 U.S.C. App. 1344, 1348(c), 1352, 1354(a), 1355, 1421 through 1431, 1502, 1651(b)(2); 42 U.S.C. 7572; E.O. 11514; 49 U.S.C. 106(g).

Amendment 21-72

Revision of Authority Citations

Adopted: December 20, 1995 Effective: December 28, 1995

(Published in 60 FR 67254, December 28, 1995)

SUMMARY: This rule adopts new authority citations for Chapter 1 of Title 14 of the Code of Federal Regulations (CFR). In 1994, the Federal Aviation Act of 1958 and several other statutes conferring authority upon the Federal Aviation Administration were recodified into positive law. This document up**DATES** the authority citations listed in the Code of Federal Regulations to reference the current law.

DATES: This final rule is effective December 28, 1995. Comments on this final rule must be received by March 1, 1996.

ADDRESSES: Comments on this final rule should be mailed, in triplicate, to: Federal Aviation Administration, Office of the

Chief Counsel, Attention: Rules Docket (AGC-200), Docket No. 28417, 800 Independence Avenue, SW., Washington, DC 20951. Comments delivered must be marked Docket No. 28417. Comments may be examined in room 915G weekdays between 8:30 a.m. and 5 p.m., except on Federal holidays.

FOR FURTHER INFORMATION CONTACT: Karen Petronis, Office of the Chief Counsel, Regulations Division, AGC-210, Federal Aviation Administration, 800 Independence Ave., SW., Washington, DC 20591; telephone: 202-267-3073.

SUPPLEMENTARY INFORMATION: In July 1994, the Federal Aviation Act of 1958 and numerous other pieces of legislation affecting transportation in general were recodified. The statutory material became "positive law" and was recodified at 49 U.S.C. 1101 et seq.

The Federal Aviation Administration is amending the authority citations for its regulations in Chapter I of 14 CFR to reflect the recodification of its statutory authority. No substantive change was intended to any statutory authority by the recodification, and no substantive change is introduced to any regulation by this change.

Although this action is in the form of a final rule and was not preceded by notice and an opportunity for public comment, comments are invited on this action. Interested persons are invited to comment by submitting such written data, views, or arguments as they may desire by March 1, 1996. Comments should identify the rules docket number and be submitted to the address specified under the caption ADDRESSES.

Because of the editorial nature of this change, it has been determined that prior notice is unnecessary under the Administrative Procedure Act. It has also been determined that this final rule is not a "significant regulatory action" under Executive Order 12866, nor is it a significant action under DOT regulatory policies and procedures (44 FR 11034, February 26, 1979). Further, the editorial nature of this change has no known or anticipated economic impact; accordingly, no regulatory analysis has been prepared.

Adoption of the Amendment

In consideration of the forgoing, the Federal Aviation Administration amends 14 CFR Chapter I as follows:

The authority citation for part 21 is revised to read as follows:

Authority: 42 U.S.C. 7572; 49 U.S.C. 106(g), 40105, 40113, 44701-44702, 44707, 44709, 44711, 44713, 44715, 45303.

Amendment 21-73|

Amendment of the Type Certification Procedures for Changes in Helicopter Type Design to Attach or Remove External Equipment

Adopted: May 1, 1996 Effective: May 7, 1996

(Published in 61 FR 20696, May 7, 1996)

SUMMARY: This final rule amends the existing helicopter noise certification procedures with respect to certain changes in type designs. The applicability of the noise certification procedures is amended to exclude those changes in type design that involve the attachment or removal of external equipment, floats and skis, and certain airframe and operational changes made to accommodate such changes in type design (acoustical change requirements). Also excluded from the applicability of the acoustical change requirements are helicopter flight operations with doors and/or windows removed or in an open position. This amendment also makes U.S. helicopter noise certification regulations more consistent with the International Civil Aviation Organization (ICAO) standards.

EFFECTIVE DATE: May 7, 1996.

FOR FURTHER INFORMATION CONTACT: Mr. Kenneth E. Jones, Research and Engineering Branch (AEE-110), Technology Division, Office of Environment and Energy, FAA, 800 Independence Avenue, SW., Washington, D.C. 20591; telephone (202) 267-8933, facsimile (202) 267-5594.

SUPPLEMENTARY INFORMATION: The purpose of this rulemaking is to amend the applicability of the helicopter noise certification procedures to exclude those changes in helicopter type design that involve the attachment or removal of external equipment, floats and skis, and certain airframe and operational changes made to accommodate such changes in type design (acoustical change requirements). Also excluded from the acoustical change requirements are helicopter flight operations with doors and/or windows removed or in an open position. This amendment is based on Notice of Proposed Rulemaking (NPRM) Notice No. 95-15 (60 FR 48790, September 20, 1995; Docket No. 28334) in which comments were invited. No comments were received in the docket in response to the NPRM. Accordingly, the final rule is adopted as proposed in the NPRM.

Background

Statement of the Problem

The certification procedures for aeronautical products and parts are contained in 14 CFR part 21. Under part 21, an applicant for approval of a change to a helicopter type certificate must show compliance with the noise regulations in 14 CFR part 36 (part 36) if the change in type design may increase the noise level of the helicopter (an acoustical change). Section 21.93 defines an "acoustical change" and classifies the aircraft which must demonstrate compliance with part 36 following an acoustical change. Section 21.93(b)(4) describes helicopters required to demonstrate compliance with part 36 for an acoustical change, and specifically excludes helicopters designated exclusively for "agricultural aircraft operations," "dispensing firefighting materials," or "carrying external loads." The intent of the existing Sec. 21.93(b)(4) is to exclude helicopters designated exclusively to carry external loads from the requirement to demonstrate compliance with part 36.

This amendment addresses type certification (including noise requirements) procedures for changes to helicopter type designs to configure helicopters for carriage of external equipment. External equipment is defined herein as any instrument, mechanism, part, apparatus, or accessory that is attached to or extends from the helicopter exterior but is not used nor is intended to be used in operating or controlling a helicopter in flight and its not part of an airframe or engine. Examples of external equipment are spotlights, cameras, airborne signs, and cargo tanks and baskets.

External equipment may be attached to a helicopter as a Class A Rotorcraft External Load Combination under 14 CFR part 133 (part 133) "Rotorcraft External Load Operations", or alternatively, the external equipment may be attached to the helicopter as a change in type design under Subpart D of part 21. The noise certification requirements do not apply to any helicopter, regardless of airworthiness certification category, that is designated exclusively for carrying external loads pursuant to part 133. Section 133.51 states that "¢a| Rotocraft External-Load Operator Certificate is a current and valid airworthiness certificate for each rotocraft . . . listed by registration number on a list attached to the certificate, when the rotocraft is being used in operations conducted under ¢part

133|." However, when the original helicopter noise certification rules were adopted in part 21, external equipment was not excluded from the acoustical change provisions of Sec. 21.93. Thus, except for helicopters operated under part 133, the addition of external equipment was, prior to this amendment, subject to the acoustical change provisions of Sec. 21.93. This amendment of Sec. 21.93 reconciles the procedural treatment of external equipment added to helicopters with the intent of Sec. 21.93(b)(4) by expanding the acoustical change exception to include carriage of external equipment.

History of Aircraft Noise Certification Regulations Relevant to This Amendment

On November 3, 1969, the Administrator of the FAA adopted part 36 entitled "Noise Standards: Aircraft Type Certification." That action implemented the FAA's regulatory noise abatement program by prescribing type certification noise standards for subsonic turbojet powered airplanes. Procedural changes were concurrently made to part 21, "Certification Procedures for Products and Parts," to provide criteria and requirements for demonstrating compliance with the specifications in part 36 (34 FR 18355, November 18, 1969). The noise certification requirements of parts 21 and 36 are designed to promote the incorporation of noise abatement technology into aircraft design. Parts 21 and 36 have been amended as appropriate to add new aircraft types to the certification requirements or change the technical specifications as necessary. Subsequently, helicopter noise certification requirements were adopted with amendment 36-14 to part 36 and amendment 21-61 to part 21 (53 FR 3534, February 5, 1988).

The first amendment to part 21 relevant to the original aircraft noise certification regulation was amendment 21-27 (34 FR 18355, November 10, 1969). That amendment established the general requirement that an applicant must demonstrate compliance with the applicable provisions of the part 36 procedures prior to issuance of an original, amended, or supplemental type certificate. The same amendment to part 21 included the addition under Sec. 21.93(b) that specified an "acoustical change" as any voluntary change in type design of a transport category or turbojet-powered airplane that may increase the noise levels of that airplane. Section 21.93 was subsequently amended in response to the promulgation of part 36 noise standards for propeller-driven airplanes (Amdt. 21-42; 40 FR 1029, January 6, 1975), supersonic airplanes (Amdt. 21-47; 43 FR 28406, June 29, 1978), commuter category airplanes (Amdt. 21-59; 52 FR 1806, January 15, 1987), and helicopters (Admt. 21-61; 53 FR 3534,

February 5, 1988).

Section 21.93 has also been amended to exclude certain changes in aircraft type design from the acoustical change requirements. The necessity for excluding these changes in type design became apparent only after experience was gained from implementation of the original noise certification regulations for the aircraft type in question. For turbojet-powered airplanes, amendment 21-56 (47 FR 756, January 7, 1982) excludes time-limited engine and/or nacelle changes, where the change in type design specifies that the airplane may not be operated for a period of more than 90 days, and amendment 21-62 (53 FR 16360, May 6, 1988) excludes both gear down flight with one or more retractable landing gear down during the entire flight and spare engine and nacelle carriage external to the skin of the aircraft. For propeller-driven commuter category and propeller-driven small airplanes, amendment 21-63 (53 FR 47394, November 22, 1988)

excludes "antique" airplanes (i.e., those airplanes that have flight time before January 1, 1955) and land configurated aircraft reconfigured with floats and skis.

Synopsis of the Amendment

This amendment changes the acoustical change provisions of Sec. 21.93 to exclude helicopters that have been modified by the addition or removal of external equipment mounted on the helicopter airframe or floats (rigid or bag) and skis. This amendment also excludes certain changes in helicopter type design from the acoustical change requirements otherwise applicable to certain airframe changes made to accommodate the external equipment and to helicopter flight operations with doors and/or windows removed or in an open position. This amendment also applies to any operating limitations placed on, or removed from the helicopter as a consequence of the addition or removal of external equipment, floats, and skis.

The FAA recognizes the utility aspect of the helicopter as an aerial platform of external equipment. It is a common practice in the helicopter industry to add or remove external equipment as mission requirements vary. Although external equipment may be offered by the original manufacturer of the helicopter, it is usually added as an after-market addition by individual operators to meet specific mission needs. Given the potential variety of external equipment, the nature of the external equipment is not considered part of the basic design of a given helicopter and does not influence the basic aerodynamic design or the incorporation of noise abatement technology into the helicopter design. As stated in the preamble of the final rule (cited

previously) for the original helicopter noise certification rulemaking, ". . . the ¢helicopter| noise standards apply ¢only| to internal load configurations."

This amendment is consistent with a similar provision in the applicability section of the helicopter noise certification standard approve by the ICAO under its International Standards and Recommended Practices: Environmental Protection; Annex 16, Volume 1, Chapters 8 and 11 (Third Edition-July 1993). This amendment brings the acoustical change provision in the U.S. noise certification regulations into closer harmony with that used by foreign noise certification authorities.

The FAA has determined that this amendment will provide benefits in the form of regulatory relief to the helicopter industry and to individual helicopter operators. This amendment will result in little or no increase of public exposure to helicopter noise emissions. Prior to this amendment, type certification procedures and the helicopter regulations changed by this amendment imposed an undue financial burden on the helicopter industry and operators without providing any measurable benefit to the public.

Details of the amendment and limitations of the amendment are provided in the following analysis.

Sec. 21.93 Classification of changes in type design.

Part 21 prescribes that certain types of aircraft, including helicopters, must demonstrate compliance with the applicable requirements of part 36 if a change in type design results in an acoustical change. Section 21.93 specifies an "acoustical change" as any voluntary change in type design (including operational limitations) that may increase the noise levels of an aircraft. This amendment, applicable only to helicopters, excludes the installation or removal of external equipment from being considered an acoustical change. The amendment specifically excludes from the acoustical change provision the addition or removal of all external equipment where "external equipment" means any instrument, mechanism, part, apparatus, appurtenance, or accessory (e.g., spotlights, cameras and other optical devices, public address systems, hoists, airborne signs, tow banners, cargo tanks and baskets, emergency flotation gear, personnel platforms, wire strike kits, crop spraying equipment, scientific apparatus and their accessories) that is not used or intended to be used in operating or controlling an aircraft in flight, that is attached to the helicopter, and is not part of an airframe or engine. This amendment applies to changes in the

airframe made to:

(1) Accommodate the addition or removal of external equipment:

(2) Facilitate the use of external equipment; or

(3) Facilitate the safe operation of the helicopter with external equipment mounted on the helicopter.

Examples of airframe changes that are excepted include fairings, attachment hardware, cavities constructed in the airframe to accommodate conformally attached equipment, and bubble windows. This amendment also excludes from the acoustical change provision external load attaching means, the airworthiness certification of which is specified in Secs. 27.865 and 29.865.

This amendment excludes the addition or removal of floats and skis on helicopters from the acoustical change provision. This amendment makes it clear that any changes in the operating limitations placed on the helicopter as a consequence of the addition or removal of external equipment, floats, and skis is not an acoustical change. Similarly, it also excludes flight operations conducted with one or more doors and/or windows removed or in an open position.

The FAA has included addition or removal of floats and skis on helicopters under this amendment in order to provide the same provision for helicopters as is currently provided small

propeller driven airplanes and propeller driven commuter category airplanes under Sec. 21.93(b)(3). The acoustical change requirements of Sec. 21.93 do not require a noise certification compliance demonstration for such airplanes because the FAA did not have a rational basis to consider such design configurations in the original rulemaking that established noise certification requirements for theses aircraft. While the addition of floats and skis adversely affects the aerodynamic performance, and consequently the noise levels, of both small airplanes and helicopters, the FAA lacks the acoustical and performance data necessary to develop noise certification regulations relevant to small airplanes and helicopters that are reconfigured by the addition of floats or skis.

If a noise compliance demonstration is otherwise required for compliance with part 36, the noise flight test must be conducted without any external equipment, floats, or skis mounted to the helicopter and with doors and windows mounted and closed (i.e., aerodynamically clean configuration) unless otherwise approved or

required by the FAA. In granting such approvals or establishing such requirements, the rationale for the FAA's decision will be based on whether or not the measured helicopter noise levels from a proposed noise compliance demonstration would be representative of a "clean configured" helicopter. For example, assume a cavity was created in the fuselage (as a related airframe change) to accommodate a conformally (flush) fitted camera. Under this amendment, both the camera and the cavity are excluded from the acoustical change requirements of part 21. However, in the event of any future noise testing of that helicopter for a change in type design unrelated to the camera and cavity, such a noise test without the camera mounted and the cavity exposed would likely lead to unrepresentative noise levels due to alternation of the aerodynamic performance of the helicopter. In this example, during the actual noise test for the unrelated change in type design, the FAA would probably require that the flush-mounted camera be inserted in its associated fuselage cavity or that the fuselage cavity be covered in a manner that would return the fuselage to its original aerodynamic shape. Similarly, any analysis for the purpose of demonstrating a "non-acoustical change" under Sec. 21.93 must assume performance levels consistent with an aerodynamically clean helicopter (relative to the changes in type design excluded under this amendment). That is, a decrease in a noise certification level effected by the addition of equipment excluded under this amendment may not be used to "mathematically" offset an increase in noise from a change in type design not affected by this amendment. For example, assuming the certification basis for a given helicopter is part 36 Appendix J, an increase in the flyover noise certification level caused by the upgrade of a transmission may not be offset by the decrease in noise from the assumed addition of external equipment, floats or skis as part of the change in type design for the transmission.

The FAA also deletes by this amendment the previous text in

Sec. 21.93(b)(4)(i) and (ii). Those paragraphs indicated examples of design changes which would be considered acoustical changes. Since Sec. 21.93(b) already makes it clear that "any voluntary change in the type design of an aircraft that may increase the noise levels of the aircraft is an 'acoustical change' . . . ." paragraphs Sec. 21.93(b)(4)(i) and (ii) could have been erroneously interepreted to indicate that (any) change to a muffler (including a change to a quieter muffler) is by regulation an acoustical change. Paragraphs (i) and (ii) did not represent a regulatory requirement and added nothing toward the interpretation of the acoustical change requirements for helicopters. The amended text addresses the definition of external equipment and the exclusions discussed earlier in this synopsis.

The FAA has examined such factors as the utility aspect of the helicopter mission, the necessity for the addition or removal of external equipment to meet mission needs, the relevance of such equipment with regard to the incorporation of noise abatement technology in the design of the helicopter, and the desire for commonality of U.S. noise certification regulations with relevant international standards and foreign national regulations. After consideration of these factors, the Administrator determined that the amendment is consistent with the criteria set forth for proposing and amending aircraft noise abatement regulations under the authority of Sec. 611(d) of the Federal Aviation Act of 1958.

International Compatibility

The FAA has reviewed corresponding ICAO standards and JAA regulations, were they exist. This amendment makes U.S. helicopter noise certification regulations more consistent with the ICAO standards.

Paper Reduction Act

In accordance with the Paperwork Reduction Act of 1980 (Pub. L. 96-511), there are no requirements for information collection associated with this amendment.

Regulatory Evaluation Summary

Three principal requirements pertain to the economic impacts of changes to the Federal Regulations. First, Executive Order 12866 directs Federal agencies to promulgate new regulations or modify existing regulations only if the expected benefits to society outweigh the expected costs. Second, the regulatory Flexibility Act of 1980 requires agencies to analyze the economic impact of regulatory changes on small entities. Finally, the Office of Management and Budget directs agencies to assess the effect of regulatory changes on international trade. In conducting these analyses, the FAA has determined that this rule: (1) Will generate benefits exceeding costs; (2) is not "significant" as defined in the Executive Order and DOT's

policies and procedures; (3) will not have a significant impact on a substantial number of small entities; (4) will lessen restraints on international trade. These analyses, available in the docket, are summarized below.

Benefits

The final rule will provide regulatory relief and a cost savings of $31,690,468 (non-discounted) or $23,409,159 discounted, over a ten year period, to helicopter manufacturers, modifers, and operators. Of this amount, the projected cost savings for part 36 noise certification testing are as follows: Appendix H testing for helicopter manufacturers is $4,800,000 (non-discounted) or $4,264,244 discounted; Appendix J testing for helicopter manufacturers is $3,000,000 (non-discounted) or $2,330,305 discounted; and Appendix J Testing for modifers, $22,500,000 (non-discounted) or $15,803,025 discounted. The FAA will also realize administrative cost savings under these appendices as follows: Appendix H, $222,460 (non-discounted) or $178,312 discounted; Appendix J, $231,740 (non-discounted) or $173,525 discounted; and Appendix J (for modifiers), $936,268 (non-discounted) or $659,748 discounted.

Costs

From a number of noise certification studies, the FAA has learned that allowing applicants to attach external equipment to their helicopters will result in no net increase in helicopter noise or, at worst, insignificant increases in noise levels.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires a Regulatory Flexibility Analysis if a rule will have a significant economic impact, either detrimental or beneficial, on a substantial number of small entities. FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance prescribes standards for complying with RFA review requirements in FAA rulemaking actions. The order defines "small entities" in terms of size thresholds, "significant economic impact" in terms of annualized cost threshold, and "substantial number" as a number that is not less than eleven and that is more than one-third of the small entities subject to the final rule.

The FAA has determined that, in accordance with the above order, the final rule to part 21 will not have a significant economic impact on a substantial number of small entities. The final rule will directly affect two types of entities: (1) Light helicopter manufacturers, and (2) small helicopter modifiers.

For small aircraft and aircraft parts manufacturers, Order 2100.14A specifies a size threshold for classification as a small

entity as 75 or fewer employees. Based upon this size threshold, all of the affected U.S. manufacturers are large. For the purpose of the regulatory flexibility determination, an aircraft modifier is considered a small entity if it has 200 on fewer employees.

The FAA concludes that a substantial number of small entities (less than one third) will not be significantly affected by the final rule. Therefore, the final rule will not impose a significant economic impact on a substantial number of small entities, and a regulatory flexibility analysis is not required.

Trade Impact Assessment

The FAA has determined that the final rule will neither affect the sale of foreign aviation products and services in the United States nor the sale of U.S. products and services in foreign countries. This determination is based on the FAA's contention that the final rule will align the U.S. standards more closely with foreign standards for noise certification of external equipment.

Federalism Implications

The regulations herein will not have a substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this proposed rule would not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Environmental Analysis

Pursuant to the Department of Transportation "Policies and Procedures for Considering Environmental Impacts" (FAA Order 1050.1D), the FAA has determined that this rule does not significantly affect the human environment. A Finding of No Significant Impact has been prepared and placed in the docket.

Justification for Immediate Adoption

The FAA has determined that further delay in the adoption of this rule would cause undue burden to U.S. manufacturers, modifiers, and operators of helicopters. This final rule does not impose new regulatory requirements; rather, it corrects an oversight in the original helicopter noise certification

rulemaking, which unnecessarily applied acoustical change noise certification requirements to some external load configurations. Although the preamble of that original rulemaking stated that the noise certification regulations applied only to internal load configurations, the necessary amendatory language that would

effect that applicability was not made in all of the relevant portions of the noise certification regulations. At present, there are several applications pending for changes in helicopter type design which call for the addition of external equipment. Without this rule, those applicants are unintentionally subject to costly noise certification testing. Accordingly, the FAA has determined that good cause exist to make this rule effective in less than 30 days.

Conclusion

The FAA has determined that this final rule: (1) is not a significant regulatory action under Executive Order 12866; (2) is not a significant regulatory action under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and (3) will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. In addition, this final rule will have little or no affect on trade opportunities for U.S. firms doing business overseas, or on foreign firms doing business in the United States.

The Amendment

Accordingly, the Federal Aviation Administration amends 14 CFR part 21 as follows:

The authority citation for part 21 continues to read as follows:

Authority: 42 U.S.C. 7572; 49 U.S.C. 106(g), 40105, 40113, 44701-44702, 44707, 44709, 44711, 44713, 44715, 45303.

Amendment 21-74

Operating Requirements: Domestic, Flag, Supplemental, Commuter, and On-Demand Operations: Corrections and Editorial Changes

Adopted: March 12, 1997 Effective: March 12, 1997

(Published in 62 FR 13248, March 19, 1997)
(Corrected in 62 FR 15570, April 1, 1997)

SUMMARY: The FAA is amending parts 21, 25, 91, 119, 121, 125, and 135 to correct errors, make terminology consistent, or clarify the intent of the regulations published on December 20, 1995 (60 FR 65832). A few changes are to clarify existing rules or to deal with other long-standing exemptions). A new Special Federal Aviation Regulation is being issued to address three problems that relate to compliance with requirements for communications facilities and aircraft dispatchers by operators in Alaska and other areas.

EFFECTIVE DATE: March 12, 1997.

FOR FURTHER INFORMATION CONTACT: Katherine Hakala, Flight Standards Service (AFS); Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591; telephone (202) 267-8166 or 267-3760.

SUPPLEMENTARY INFORMATION:

Availability of the Final Rule

An electronic copy of this document may be downloaded using a modem and suitable communications software from the FAA regulations section of the Fedworld electronic bulletin board service (telephone: 703-321-3339) or the Federal Register's electronic bulletin board service (telephone: 202-512-1661).

Internet users may reach the FAA's web page at http://www.faa.gov or the Federal Register's webpage at http://www.access.gpo.gov/su_docs for access to recently published rulemaking documents.

Any person may obtain a copy of this final rule by mail by submitting a request to the Federal Aviation Administration, Office of Rulemaking, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267-9677. Communications must identify the docket number of this final rule.

Persons interested in being placed on the mailing list for future NPRM's should request from the FAA's Office of Rulemaking a copy of Advisory Circular No. 11-2A, Notice of Proposed Rulemaking Distribution System, that describes the application procedure.

Background

On December 20, 1995, new part 119, Certification: Air Carriers and Commercial Operators, was published in the Federal Register (60 FR 65832; December 20, 1995). Part 119 reorganizes, into one part, certification and operations specifications requirements that formerly existed in SFAR 38-2 and in parts 121 and 135. The final rule for new part 119 also deleted or changed certain sections in part 121, Subparts A through D, and part 135, Subpart A, because the requirements in those subparts have been recodified in part 119. On January 26, 1996, another final rule was published (61 FR 2608) affecting parts 119, 121, and 135. That amendment made editorial and terminology changes in the remaining subparts of parts 121 and 135 to conform those parts to the language of part 119 and to make certain other changes. Additional documents making editorial changes and corrections were published on March 11, 1996 (61 FR 9612), and June 14, 1996 (61 FR 30432).

Part 119 was issued as part of a large rulemaking effort, known as the "commuter rule," to upgrade the requirements that apply to scheduled operations conducted in airplanes that have a passenger seat configuration of 10 to 30 passengers. As of March 20, 1997, these operations will be conducted under the requirements of part 121, in accordance with the final rule published on December 20, 1995.

Notice of Proposed Rulemaking

On February 3, 1997, the FAA published an NPRM (62 FR 5076; Notice No. 97-1) proposing changes to correct errors, make terminology consistent, clarify the intent of part 119 and the commuter rule published on December 20, 1995, as well as make other minor changes not directly related to the commuter rule. These proposed changes are considered important because, as a result of the implementation of part 119 and the completion of the transition process for commuter operations affected by the final rule, a number of questions of interpretation have been raised and errors in previous final rules have been identified. In addition, a new Special Federal Aviation Regulation (SFAR) is needed to address three problems that relate to compliance with requirements for communications facilities and for aircraft dispatchers by operators in Alaska and other areas.

Public Comment

The FAA requested comments, within 30 days of publication of Notice No. 97-1, on a number of proposals contained in the NPRM. Interested persons were invited to participate in this rulemaking action by submitting written data, views, or arguments. All comments received were considered before issuing this final rule.

The FAA received 19 comments in response to Notice No. 97-1. Comments were received from operators affected by the proposed rule, aircraft dispatchers, industry associations, and a manufacturer of communications system. Many commenters stressed the importance of having the final rule issued before March 20, 1997, when the majority of the commuter rule provisions go into effect. Other specific comments are summarized in the following section-by-section discussion of the final rule, which includes the FAA's responses to these comments.

Explanation of Amendments

A number of changes are necessary in parts 21, 25, 91, 119, 121, 125, and 135 to correct typographical errors, to make minor editorial changes that help clarify the intent of the rules, or to make editorial changes that make related rules consistent with each other. These types of changes are not individually explained. However, a number of changes requires some explanation, which follows:

1. The proposal revised the definitions of "on-demand operation," "scheduled operation," and "supplemental operation"

in Sec. 119.3 to make it clear that public charter operations conducted under 14 CFR part 380 are not considered scheduled operations.

No comments were received on the proposed definitions and the changes to Sec. 119.3 are adopted as proposed.

2. The proposal amended Sec. 119.5 to add new paragraph (k), which incorporated former Sec. 135.31 into part 119. As proposed, this section prohibited advertising or otherwise offering to perform any operation unauthorized by the FAA, and it was applicable to any person, including certificate holders operating under part 121, as well as those operating under part 135.

The proposal also added Sec. 119.5(1) which stated that, for safety purposes, people who operate aircraft under parts 121 and 135 must comply with the provisions in a certificate holder's operations specifications. This paragraph was proposed to prevent an employee of a certificate holder (with or without other certificate holder's knowledge) from violating the provisions of the certificate holder's operations specifications. For example, if a certificate holder is only authorized to carry cargo, a flight crewmember would not be allowed to bring along a friend as a passenger on the commercial flight.

No comments were received on these proposals and the changes to Sec. 119.5 are adopted as proposed.

3. The proposal amended Sec. 119.9 to allow displaying the air carrier or operating certificate number on an aircraft instead of the name of the certificate holder. As described in the NPRM, a petition by the National Air Transportation Association (NATA) and supporting comments requested that, for security and financial reasons, operators be allowed to display the air carrier or operating certificate number in lieu of the name of the certificate holder. In the NPRM, the FAA agreed that display of an air carrier or operating certificate number would meet the intent of this requirement, which is to provide a ready means of identifying a responsible certificate holder when an aircraft is parked and the FAA has reason to identify or contact the certificate holder. Therefore, the FAA proposed to amend Sec. 119.9(b)(4) as requested by NATA.

The proposal also deleted the provision allowing the Assistant Administrator for Civil Aviation Security to grant deviations from the requirements of this section because the FAA no longer believed that these deviations were necessary.

NATA, Helicopter Association International (HAI), and individual operators affected by the proposed change to Sec. 119.9(b) comment in support of allowing part 135 operators to display their air carrier or operating certificate number on an aircraft instead of the name of the certificate holder. Commenters emphasize that, if the FAA adopts the proposed amendment, it is imperative to make the amendment effective

before March 20, 1997, so that they will not need to apply the certificate holder's name temporarily on the aircraft, and then remove it when the amendment takes effect later. One operator comments that even having the operating certificate number on the aircraft creates a security risk for some customers.

As discussed above, the FAA must be able to readily identify the responsible certificate holder conducting an operation, and having the air carrier or operating certificate number on an aircraft will provide the necessary identification. Therefore, the changes to Sec. 119.9 are adopted as proposed and are effective as of the date of issuance of this final rule.

4. The proposal amended Sec. 119.21(a)(1) to allow domestic operations conducted from the Pribilof Islands and the Shumagin Islands to request permission to comply with the dispatching requirements of subpart U of part 121 applicable to flag operations. The NPRM also stated that, in the final rule, the FAA may include other Alaskan island locations in this provision, if requested to do so by commenters and if adding the names of those islands is consistent with safety considerations.

No comments were received on the proposal and the changes to Sec. 119.21 are adopted as proposed.

5. The proposal amended Sec. 119.35 to clarify that the additional financial and contract reporting requirements of this section apply only to commercial operators. The proposal split Sec. 119.35 into two sections: Proposed Sec. 119.35 contained just the certificate application procedures that apply to all applicants, and new Sec. 119.36 contained the additional requirements for commercial operators.

In the NPRM, the FAA proposed that Sec. 119.36 distinguish between requirements for all commercial operators and those applicable only to commercial operators under part 121. In addition, the FAA proposed to delete the financial reporting requirements of Sec. 135.64(b), but to retain the contract retention requirements in Sec. 135.64(a).

No comments were received on the proposal and Secs. 119.35 and 119.36 are adopted as proposed.

6. The proposal revised Sec. 119.67 (c) and (d) to amend the qualification requirements applicable to Directors of Maintenance and Chief Inspectors under part 121. The proposal also revised Sec. 119.71(e) to amend the qualification and experience requirements applicable to the Director of Maintenance under part 135.

Both proposals established requirements for a person becoming the Director of Maintenance or Chief Inspector for the first time. These proposals were designed to ensure that persons holding these required management positions have the measure of experience and the demonstrated capability of effectively

managing these programs.

The FAA proposed that, under Secs. 119.67(c)(1) and 119.71(e)(1), the Director of Maintenance must have held the airframe and powerplant ratings for 3 years.

The proposal also amended Sec. 119.67(c)(2) by changing the existing 1 year of maintenance experience in a supervisory capacity in maintaining the category and class of airplane used by the certificate holder, to 3 years of supervisory experience within the last 6 years in a position that exercised operational control over maintenance program functions.

In addition, the proposal amended Sec. 119.67(c)(4)(i)(B) by replacing the word "repairing" with the word "maintaining", as the latter is consistent with the definition of maintenance as defined in 14 CFR 1.1. In addition, the word "maintaining" reflects the broader experience level more appropriate to the Director position.

For the Chief Inspector position, the proposal changed Sec. 119.67(d)(2) to require 3 years of supervisory or managerial experience within the last 6 years.

The proposal also revised Sec. 119.67(e) to clarify that certificate holders may request a deviation from the experience requirements of the section, but not from the airman certificate requirements of the section. Therefore, a certificate holder would not be allowed to employ a person who does not hold the required airman certificates (e.g., ATP certificate, commercial pilot certificate, mechanic certificate).

Proposed Sec. 119.71 contained the management qualification requirements that formerly appeared in 0135.39. Section 119.71 (b) and (d) required that the Director of Operations and the Chief Pilot, respectively, must hold at least a commercial pilot certificate with an instrument rating. However, under former Sec. 135.39 the instrument rating was required only if any pilot in command for that certificate holder was required to have an instrument rating. For operations such as a VFR only helicopter operation, the pilot in command is not required to hold an instrument rating. Therefore the FAA proposed that Sec. 119.71 (b) and (d) be revised to match the intent of former Sec. 135.39.

HAI comments in support of the proposed amendment of Sec. 119.71 (b) and (d) on behalf its membership, which includes a substantial number of VFF-only helicopter operations. HAI states that without the amendment to Sec. 119.71 (b) and (d) many operators would be forced to suspend operations until personnel that meet the current requirements can be identified and hired, and that there may not be enough such personnel available. HAI believes that this burden would be onerous and inappropriate in view of the fact that the operators in question do not conduct instrument operations.

The FAA agrees with HAI's comments and the amendments to Sec. 119.71 (b) and (d) are adopted as proposed. No comments were received on the proposal to revise Secs. 119.67(e) and 119.71(f) and those amendments are adopted as proposed. The FAA has reviewed the proposed changes to the experience requirements for Director of Maintenance and Chief Inspector in light of issues raising during implementation of the commuter rule and the determined that further study of these proposal is necessary. Therefore the FAA withdraws the proposal amendments to Secs. 119.67(c) and (d) and 119.71(e), for consideration in a future rulemaking.

7. In the NPRM, the FAA proposed that anew Special Federal Aviation Regulation (SFAR) be added to part 121 to address two problems that relate to compliance with Sec. 121.99 and a third problem that relates to compliance with 0121.395. These are outlined below.

(1) The first problem involves certain communications difficulties in Alaska and other areas affecting certificate holders who are required by Sec. 121.99 to "show that a two-way air/ground communication system is available at all points that will ensure reliable and rapid communications under normal operating conditions over the entire route (either direct or via approved point to point circuits) between each airplane and the appropriate dispatch office and between each airplane and the appropriate air traffic control unit."

The NPRM pointed out that, in certain areas, the lack of infrastructure or appropriate technology has prevented certificate holders from establishing such systems. For other certificate holder the nature of their operations (e.g., flying at low altitudes or in mountainous terrain) has prevented them from using current communication systems that may be reliable only at higher altitudes.

If a certificate holder shows to the Administrator that

communications gaps exist due to such reasons as lack of infrastructure, ATC operating restrictions, the terrain, operating altitude, or feasibility of a certain kind of communications system, the certificate holder would be allowed to continue to operate over that route if the certificate holder establishes alternative procedures for prompt re-establishment of communication, for establishment that the airplane arrived at its destination, and for flight locating purposes. Under the SFAR, relief would only be granted after the certificate holder shows that it would meet the requirements to the maximum extent possible. In granting such approval, the Administrator would consider certain factors that are listed in the SFAR.

Under the proposed SFAR, the certificate holder would obtain the approval of the Administrator in its operations specifications. The requests will be processed through the

certificate-holding district office, with concurrence by the FAA's Air Transportation Division (AFS-200). This type of alternative compliance approval would only be available for scheduled operations with airplanes having a passenger-seat configuration of 30 seats of fewer, excluding each crewmember seat, and a physical capacity of 7,500 pounds of less under part 121 of this chapter.

(2) The second Sec. 121.99-related problem involves certificate holder who have conducted or who might in the future conduct scheduled intrastate operations in Alaska. Under the pre-commuter rule amendments these operations under the rules applicable to flag air carriers and thus, under the last sentence of Sec. 121.99, were not prohibited from using a communications system operated by the United States. For certificate holders operating intrastate in Alaska, whether certificate before or after January 19, 1996, it was considered impractical at that time to mandate that the required communications systems be independent of any system operated by the United States.

Therefore even though these certificate holder would otherwise have been required to comply with the operating rules for domestic operations, under the proposed SFAR they would be allowed to use systems operated by the United States, when there is no practical alternative, for the 4-year effective period of the SFAR. The FAA further propose to amend Sec. 121.99 to require that, concurrent with the expiration of the SFAR, all flag operations in Alaska, not just those affected by the commuter rule change mentioned above, have communications systems that are independent of any system operated by the United States.

(3) The third issue addressed by the proposed SFAR relates to the use of aircraft dispatchers by former computer operations in Alaska who are required by the computer rule to have a part 121 dispatch system. It is long-standing FAA policy that each certificate holder subject to Sec. 121.395 have aircraft dispatchers that are employed exclusively by that certificate holder. However, small operations located in remote areas have found it hard to attract qualified, certificated aircraft dispatchers to work and live in those areas.

Therefore the FAA proposed to allow certificate holders conducting scheduled operations in Alaska with airplanes having a passenger-seat configuration of 30 seats or fewer, excluding each crewmember seat, and a payload capacity of 7,500 pounds or less under part 121 of this chapter, to share aircraft dispatchers if they are authorized to do so by the Administrator in their operations specifications. The requests will be processed through the certificate-holding district office, with concurrence by the FAA's Air Transportation Division (AFS-200). Before granting such an authorization, the Administrator would consider certain factors that are listed in the SFAR.

The FAA proposed that the SFAR would expire 4 years after it

is issued because the FAA expects that adequate communications facilities would become available in all parts of Alaska and other areas within that time.

Several commenters address the provisions in the proposed SFAR. The Air Transport Association (ATA) sees no reason why the SFAR should be so restrictive and limited to commuter operations, because from a safety standpoint, larger aircraft have greater fuel capacity and alternate airport capability, and generally have a larger safety margin built in than small commuter aircraft. NATA believes that the proposed SFAR does not adequately address the special nature of flight operations in rural Alaskan areas, because the inherent problem is that Alaska simply does not have the infrastructure to guarantee communications in remote areas. Also NATA believes that operations in designated remote areas, where flights are mainly VFR, flight plans frequently change, and airports are often unattended, should not be subjected to the same stringent dispatching requirements applied to other part 121 operations. An aeronautical communications company disagrees with FAA's statements on lack of infrastructure and availability of appropriate technology. This commenter believes that there is a wide variety of choices available to meet the communication needs for positive operational control and that operators in remote geographical areas may need to make a combination of choices to allow them to meet the requirements of the current rules.

The Airline Dispatchers Federal (ADF) and an individual aircraft dispatcher address the relationship between the communications system required by Sec. 121.99 and the role of the aircraft dispatcher in providing information that may affect the safety of the flight to the pilot in command. ADF believes that adequate air ground communication technology is available for Alaskan operations, but that if there is a lack of weather reporting along their routes, air carriers can provide station and other personnel with telephone, dial access radio, HF, VHF, or SatComm communications and provide them with the training to provide accurate weather and aerodrome information. ADF further suggests that Alaskan air carriers cooperate to build their own radio network to cover their routes or that the State of Alaska may want to help finance any additional infrastructure required for scheduled air service in Alaska.

ADF suggests that Alaskan pilots, operating under a "bush" mentality, have knowingly flown in IMC or VFR flights in response to operational pressures, and that when adequate communication systems are in place and aircraft dispatchers are able to obtain accurate information on weather and other local conditions, the pilots will no longer be able to decide on their own whether or not to initiate or continue a particular flight, because, if the information does not show the operation can be conducted safely, the dispatcher may not authorize the flight.

ADF and the aircraft dispatcher object to FAA's proposal to allow Alaskan air carriers to share aircraft dispatchers under

certain conditions. The commenters fear that a dispatcher working under contract or exercising operational control on a competitor's flight may have his or her actions second-guessed by the management of the other airline. ADF comments that a shared dispatcher may be kept at a distance from the operations and only told what company employees want the dispatcher to know.

ADF and the dispatcher believes that part 135 operators who have faced the challenge of complying with the communications and dispatching rules of part 121 should be commended and not effectively penalized economically by competitors who take advantage of the provisions in the proposed SFAR.

After careful consideration of these comments, the FAA has decided to issue the SFAR as proposed. The FAA disagree with ATA's assertion that the SFAR should also apply to air carriers operating larger planes, but instead agrees with ADF that the rules in part 121 requiring adequate communications system and a

full aircraft dispatching system for scheduled operations have contributed for many years to a high level of safety that should be applied as well to scheduled operations affected by the commuter rule. The purpose of the SFAR is to allow the FAA, the affected commuter operators, and the communications equipment industry to work together to bring every commuter operator into compliance with part 121 as soon as possible. However, the FAA's experience in implementing the commuter rule has been that there are gaps in certain remote areas that could not be remedied before the March 20, 1997, deadline for implementing the commuter rule. This is the exception rather than the rule. The limited number of commuter operators who have not been able to close the communications gaps along all of their routes have been evaluating systems and trying to develop plans for complying with Sec. 121.99.

The SFAR will allow extra time for the installation of ground-based systems, the development of satellite systems, or the development and approval of technology appropriate to the needs of remote operators.

The FAA agrees with commenters that the role of aircraft dispatchers is critical to ensuring the safety of flight, particularly in areas such as Alaska that are subject to difficult and changing weather conditions. That is why the FAA is not excepting Alaskan carriers from the dispatcher requirement. However, under section 1205 of the Federal Aviation Reauthorization Act of 1996 (Pub. L. 104-264), when modifying regulations affecting intrastate aviation in Alaska, the FAA Administrator must consider the extent to which Alaska is not served by transportation modes other than aviation, and must establish such regulatory distinctions as the Administrator considers appropriate. Also, in implementing the commuter rule, the FAA has found that in the unique environment of Alaska, it is difficult to recruit and retain qualified certificated aircraft dispatchers. The commenters' fears about the potential for

contract dispatchers or dispatchers exercising operational control over competitors' flights are unwarranted because the SFAR allows for the sharing of dispatchers by 2 companies would be authorized to share a dispatcher only when the companies can show the FAA that they have joint plans for complying with the dispatcher training and qualification rules and that the number of flights for which the dispatcher would be responsible would not be beyond the capacity of a single dispatcher.

The FAA does not think that authority to operate under the SFAR would provide an economic advantage to a commuter operator because the authority will be granted in a very limited number of cases and only when the operator has shown to the FAA that it is proceeding on a plan and has a schedule for coming into full compliance with the part 121 rules within 4 years.

8. The proposal amended Sec. 121.99 to allow for "other means of communication approved by the Administrator" as an alternative to the tow-way radio communication system required by that section. This would allow certificate holders to use other types of technology, such as datalink or telephonic communication systems, to comply with this section.

No comments were received on the proposal and the changes to Sec. 121.99 are adopted as proposed.

9. The proposal amended the manual requirements in Secs. 121.137, 121.139, 125.71, 135.21, and 135.427 to make these sections compatible with Sec. 121.133. (Section 121.133 had been revised in the commuter rule to allow a certificate holder to prepare its maintenance manual in any form acceptable to the Administrator.) Therefore, the FAA proposed in the NPRM to include the language "any form acceptable to the Administrator" in the sections above.

The proposal also amended these sections to clarify that, regardless of the form of the maintenance manual, it must be retrievable in the English language. Certificate holders who purchase equipment from foreign manufacturers or previous foreign owners must ensure that the maintenance instructions to be followed by their employees and reviewed by the FAA are in English.

No comments were received on the proposal and the changes to the manual requirements are adopted as proposed.

10. The proposal revised Sec. 121.305(j) to clarify the requirements for third attitude indicators for turbopropeller powered airplanes having a passenger seat configuration of 30 seats or fewer and turbopropeller powered airplanes with more than 30 seats. The latter have been required to have third attitude indicators since October 1994.

No comments were received on the proposal and the changes to Sec. 121.305 are adopted as proposed.

11. The FAA proposed to allow 2 years from the date of the final rule for the affected operators to install emergency exit locating signs that comply with Sec. 121.310(b)(1). The additional 2 years for compliance would be granted to both in-service 10-19 seat airplanes and newly manufactured 10-19 seat airplanes. Paragraph (b)(1) of Sec. 121.310 requires that the identity and location of each passenger emergency exit must be marked so that the exit is recognizable from a distance equal to the width of the cabin and that the location of the exit must be indicated by a sign visible to occupants approaching along the main passenger aisle. Paragraph (b)(1)(i) requires that one of the locating signs must be on the ceiling of the cabin. Because of limited headrooms, most of the 10-19 seat airplanes used by operators subject to the commuter rule do not have locating signs mounted flush to the cabin sidewalls. For these 10-19 seat airplanes with limited headroom, the simplest means of complying may be to replace the two-dimensional signs with beveled or three-dimensional signs that can be read easily at the cabin extremes; that type of sign would function to both identify and locate the corresponding exit.

The FAA also proposed adding a paragraph (b)(2)(iii) to Sec. 121.310; this paragraph identifies the certification requirements for passenger emergency exit marking and locating signs. The proposal addressed the 10-19 passenger seat nontransport category airplanes. Similar to paragraph (b)(2)(i), it would mandate that the sign luminescence be 160 microlamberts at the time of manufacture; it would also prohibit the use of a sign in service if the luminescence decreases to below 100 microlamberts. Proposed paragraph (b)(2)(iii) should provide adequate levels of luminescence; the signs would have the same brightness as signs in some transport category airplanes currently manufactured and currently operated under part 121, which have no longer distances between exits than the 10-19 passenger seat airplanes.

No comments were received on the proposals and the changes to Sec. 121.310 are adopted as proposed.

12. The proposal amended Sec. 121.133(c) to correct an omission concerning the use of quick-donning oxygen masks at flight levels above 250 as a substitute for having one pilot at the controls wear and use an oxygen mask at all times. For pressurized turbine engine powered airplanes, Sec. 121.333(c) has allowed the availability of a quick-donning mask to be a substitute for wearing and using a mask at all times at or below flight level 410. However, under Sec. 135.89(b)(3) at least one pilot at the controls of a pressurized airplane is required at altitudes above flight level 350 to wear and use an oxygen mask at all times.

For those 10-30 passenger airplanes that will be operating under part 121 as a result of the commuter rule amendments, the proposal stated that flight level 350 rather than flight level

410 would continue to be the appropriate altitude at which at least one pilot at the controls would be required to wear an oxygen mask at all times.

Since the commuter rule was not intended to relax this requirement, the FAA proposed to amend Sec. 121.333(c) to incorporate the requirements of Sec. 135.89(b)(3) for airplanes with less than 31 seats, excluding any required crewmember seat, and a payload capacity of 7,500 pounds or less.

No comments were received on the proposal and the changes to Sec. 121.333 are adopted as proposed.

13. The proposal amended Sec. 121.437 to eliminate a redundancy that was created by an earlier corrective amendment and by adding a new sentence that would have the effect of codifying an existing exemption that had been in effect since 1980.

The FAA granted the ATA an exemption from Sec. 121.437 (Exemption No. 2965), allowing a pilot employed by a part 121 certificate holder as a flight crewmember to be issued additional category and class ratings to the pilot's certificate if the pilot had satisfactorily completed the appropriate training requirements of subpart N and the proficiency check requirements of Sec. 121.441 by presenting proof of this to the Administrator. This exemption was extended 9 times and is due to expire on July 31, 1997.

Over the 16 years that the exemption has been in effect, there has been no known derogation of safety. Therefore, since the FAA has not had the resources to conduct each proficiency check required by the rule, the FAA proposed to codify Exemption 2965 into Sec. 121.437.

ATA supports the proposed changes to Sec. 121.437 and adds that codifying the exemption will also reduce the administrative burden on both the airlines and the FAA. The final rule is adopted as proposed.

Tables 1-4 From the Commuter Rule

In the preamble of the NPRM for this final rule, the FAA corrected and republished 3 tables that were a part of the original commuter rule preamble: Table 2, Comparable Sections in Parts 121 and 135, and Tables 3 and 4, the Derivation and Distribution Tables for Part 119. There have been no changes to these informational tables since the NPRM was published (February 3, 1997; 62 FR 5076). The FAA is in the process of updating Table 1, **SUMMARY** of New Equipment and Performance Modifications for Affected Commuters, originally published in the commuter rule, to present the delayed compliance **DATES** for the equipment and performance modifications required by the commuter rule and subsequent amendments.

Any person may obtain a copy of Tables 1-4 by mail by submitting a request to: Linda Williams, Federal Aviation Administration, Office of Rulemaking, 800 Independence Avenue, SW., Washington, DC 20691, or by calling (202) 267-9685.

Federalism Implications

The regulations herein do not have substantial direct effects on the states, on the relationship between national government and the states, or on the distribution of power and responsibilities among various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Paperwork Reduction Act

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), there are no new requirements for information collection associated with this rule.

Good Cause Justification for Immediate Adoption

This amendment is needed to make editorial corrections and other changes to the commuter rule that must be in place before the commuter rule takes final effect on March 20, 1997. In view of this need to expedite these changes, and because the amendments would impose no additional burdens on the public, I find that the amendment should be made effective in less than 30 days after publication. Therefore, this final rule is effective as of the date of issuance.

Conclusion

The FAA has determined that this final rule imposes no additional burden on any person. Accordingly, it has been determined that the action: (1) Is not a significant rule under Executive Order 12866; and (2) is not a significant rule under Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). No cost impact is expected to result and a full regulatory evaluation is not required. In addition, the FAA certifies that the final rule will not have a

significant cost impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

Adoption of Amendments

Accordingly, the Federal Aviation Administration amends 14 CFR part 21 effective May 7, 1996.

The authority citation for part 21 continues to read as follows:

Authority: 42 U.S.C. 7572; 49 U.S.C. 106(g), 40105, 40113, 44701-44702, 44707, 44709, 44711, 44713, 44715, 45303.

Amendment 21-75

Primary Category Seaplanes

Adopted: November 19, 1997 Effective: February 23, 1998

(Published in 62 FR 62806, November 25, 1997)

SUMMARY: This direct final rule increases the maximum weight limit for seaplanes that are proposed for type certification in the primary category. When the Federal Aviation Administration (FAA) established the 2,700-pound maximum weight limit for primary category aircraft, it did not consider seaplanes. Seaplanes generally weigh more than comparable landplanes because of the increased airframe weight and drag associated with their designs. Therefore, the 2,700-pound maximum weight limit for primary category aircraft results in a significantly inferior performance, range, and payload when applied to seaplanes than was originally intended for primary category aircraft. The FAA has determined that a 3,375-pound maximum weight limit would provide seaplanes with a level of utility comparable to primary category landplanes.

DATES: Effective February 23, 1998.

Comments for inclusion in the Rules Docket must be received on or before December 26, 1997.

ADDRESSES: Comments on this direct final rule should be delivered, in triplicate, to: Federal Aviation Administration, Office of the Chief Counsel (AGC-200), Attention: Rules Docket, Docket No. 27641, 800 Independence Avenue, SW., Washington, DC 20591. Comments also may be submitted electronically to the following Internet address: 9-NPRM-CMTS@faa.dot.gov. Comments submitted must be marked: Docket No. 27641. Comments may be examined in Room 915G on weekdays between 8:30 a.m. and 5:00 p.m., except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Brian A. Yanez, Certification Procedures Branch (AIR-110), Aircraft Certification Service, Federal Aviation Administration, 800 Independence Avenue, SE., Washington, DC 20591, telephone (202) 267-9588.

SUPPLEMENTARY INFORMATION:

Direct Final Rule Procedure

The FAA anticipates that this regulation will not result in adverse or negative comments, and, therefore, is issuing it as a

direct final rule. The subject of this rulemaking was raised previously in the Federal Register through the publication of a notice of a petition for exemption to permit an amphibious airplane to be type certificated in the primary category with a maximum weight of 3,300 pounds. The FAA received 115 favorable comments and no negative comments on the proposed increased weight limit.

Unless a written adverse or negative comment, or a written notice of intent to submit an adverse or negative comment, is received on this direct final rule within the comment period, the regulation will become effective on the date specified. After the close of the comment period, the FAA will publish a document in the Federal Register indicating that no adverse or negative comments were received and confirming the date on which the final rule will become effective.

If the FAA does receive, within the comment period, an adverse or negative comment, or written notice of intent to submit such a comment, a document withdrawing the direct final rule will be published in the Federal Register, and a notice of proposed rulemaking (NPRM) may be published with a new comment period.

Comments Invited

Although this action is in the form of a final rule and was not preceded by an NPRM, comments are invited on this rule. Interested persons are invited to comment on this rule by submitting such written data, views, or arguments as they may desire. Comments should identify the Rules Docket number and be submitted in triplicate to the address specified under the caption ADDRESSES. All communications received on or before the closing date for comments will be considered, and this rule may be amended or withdrawn in light of the comments received. Factual information that supports a commenter's ideas and suggestions is helpful in evaluating the effectiveness of this action and determining whether additional rulemaking action would be needed.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the rule that might suggest a need to modify the rule. Substantive comments should be accompanied by cost estimates. All comments submitted will be available, before and after the closing date for comments, in the Rules Docket for examination by interested persons. A report summarizing each substantive public contact with FAA personnel concerning this action will be filed in the docket.

Commenters wishing the FAA to acknowledge receipt of their comments must submit with those comments a pre-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 27641." The postcard will be date stamped and returned to the commenter.

Availability of Final Rule

Using a modem and suitable communications software, an electronic copy of this document may be downloaded from the FAA regulations section of the FedWorld electronic bulletin board service (telephone: 703-321-3339).

Internet users may reach the FAA's web page at http://www.faa.gov or the Office of the Federal Register's web page on GPO Access at http://www.access.gpo.gov/nara/index.html for access to recently published rulemaking documents.

Any person may obtain a copy of this final rule by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267-9680. Communications must identify the amendment number or docket number of this direct final rule.

Background

Statement of the Problem

On December 22, 1993, a manufacturer of amphibious kit planes petitioned the FAA for exemption from the maximum weight limit for type certification of primary category aircraft in Sec. 21.24(a)(1)(ii) of Title 14, Code of Federal Regulations (14 CFR). The manufacturer listed the individual components that cause amphibious airplanes to weigh more than landplanes with a comparable utility. On May 10, 1994, a **SUMMARY** of the petition was published in the Federal Register (59 FR 24209) for public comment. The FAA subsequently determined that the manufacturer's request should be addressed in a rulemaking action rather than through the exemption process, because the relief sought addressed the general applicability of the type certification requirements for primary category aircraft.

History

On September 9, 1992, the FAA published in the Federal Register (57 FR 41360) a final rule establishing a new certification category for personal- and recreational-use aircraft, known as primary category aircraft. The final rule established simplified procedures for type, production, and airworthiness certification, and associated maintenance procedures for these aircraft. The intent of the rule was to: (1) provide a category for aircraft that are less costly to certificate, produce, purchase, and maintain than current normal category aircraft; (2) stimulate the introduction of new, less costly aircraft designs; (3) enable kit manufacturers to fill the demand for low-cost aircraft; and (4) improve the safety of kit-built aircraft presently being certificated as experimental, amateur-built aircraft.

Primary category airplanes may be unpowered or powered by a single, naturally aspirated engine, with a stall speed of 61 knots or less. These airplanes are limited to a maximum weight of 2,700 pounds, a maximum seating capacity of four persons, and an unpressurized cabin. Seaplanes were not considered when the primary category weight limit was established.

Discussion

A seaplane is an airplane designed to take off from and land on water. A seaplane can be classified as a flying boat, whose hull is the means of support on the water, or a floatplane, which is supported on the water by one or more floats. Amphibious airplanes are seaplanes designed to take off from and land on either water or land.

Seaplanes generally weigh more than comparable landplanes due to the increased airframe weight and drag associated with their designs. Therefore, the 2,700-pound maximum weight limit for primary category aircraft results in a significantly inferior performance, range, and payload when applied to seaplanes than was originally intended for primary category aircraft. The following features may contribute to a seaplane's increased weight:

(1) A requirement for more horsepower to counteract the increased drag of the hull/step configuration and sponsons. Seaplanes typically require a six-cylinder engine rather than the lighter four-cylinder engine used on landplanes weighing less than 2,700 pounds;

(2) Increased structural strength of the airplane's pylon or tail structure to support the engine and propeller, which are usually mounted above the hull;

(3) Larger elevators and stabilizers to overcome the vertical pitching forces and a larger rudder for yaw stability due to the high thrust line;

(4) A water rudder mechanism for taxiing in the water;

(5) Structural strengthening of the hull (including skin strength, bulkheads, and longerons) to withstand water takeoff and landing loads;

(6) Wing sponsons and necessary reinforcement of the wing structure to carry additional loading; and

(7) Retractable landing gear to permit operations from water or land.

Because seaplanes weigh an average of 25 percent more than comparable landplanes, this rule increases the maximum weight limit by 25 percent, to 3,375 pounds, for seaplanes certificated in the primary category. This increase should offer primary

category seaplanes a level of utility comparable to primary category landplanes.

Currently, many seaplanes are certificated as experimental airplanes. The inclusion of seaplanes in the primary category will result in safety benefits by standardizing the design and construction processes of these airplanes through the type certification process. The FAA notes that kit-built seaplanes are eligible for certification in the primary category if the kit is supplied by an FAA-approved manufacturer and is assembled under the supervision and quality control of the production approval holder.

Paperwork Reduction Act

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), there are no reporting or recordkeeping requirements associated with this direct final rule.

International Compatibility

The FAA has reviewed corresponding International Civil Aviation Organization (ICAO) standards and Joint Aviation Authorities (JAA) regulations and found no comparable primary category certification standards. The FAA notes that because primary category aircraft have a special airworthiness certificate rather than an airworthiness certificate based on ICAO Annex 8 standards, owners of U.S.-registered primary category aircraft would require prior permission of the appropriate airworthiness authority to operate outside the United States.

Regulatory Evaluation Summary

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs Federal agencies to consider, for new regulations or modifications to existing regulations, if the potential benefits to society outweigh the potential costs. Second, the Regulatory Flexibility Act (RFA) of 1980 requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Office of Management and Budget directs agencies to assess the effects of regulatory changes on international trade. In conducting these assessments, the FAA has determined that the proposed rule: (1) would generate benefits exceeding its costs and is not "significant" as defined in Executive Order 12866; (2) would not be "significant" as defined in the Department of Transportation's (DOT) Policies and Procedures; (3) would not have a significant impact on a substantial number of small entities; and (4) would not restrain international trade. These analyses, available in the docket, are summarized below.

The rule will provide the opportunity to reduce certification and manufacturing costs for seaplanes weighing between 2,700 and 3,375 pounds that otherwise would be certificated under Sec.

21.21. The rule makes available simplified procedures for type, production, and airworthiness certification, and associated maintenance procedures for these aircraft. The certification basis and standards afforded by this amendment will be an option for the affected parties. Manufacturers and owners/operators will only select the new alternative if it is in their own best economic interests to do so. Therefore, the FAA concludes that the rule will be cost beneficial.

Regulatory Flexibility Determination

The RFA of 1980 was enacted by Congress to ensure that small entities are not unnecessarily or disproportionately burdened by Government regulations. The RFA requires a Regulatory Flexibility Analysis if a rule will have a significant economic impact, detrimental or beneficial, on a substantial number of small entities. FAA Order 2100.14A, Regulatory Flexibility Criteria and Guidance, establishes threshold cost values and small entity size standards for complying with RFA review requirements in FAA rulemaking actions. Since the alternatives afforded will be optional, the rule will not have a significant economic impact on a substantial number of small entities.

International Trade Impact Statement

The rule will not constitute a barrier to international trade, including the export of U.S. goods and services to foreign countries and the import of foreign goods and services into the United States.

Federalism Implications

The regulations adopted herein will not have substantial direct effects on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that this final rule does not have sufficient federalism implications to warrant the preparation of a Federalism Assessment.

Unfunded Mandates Reform Act Assessment

Title II of the Unfunded Man**DATES** Reform Act of 1995 (the Act), codified as 2 U.S.C. 1501-1571, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in expenditures by State, local, and tribal governments, in the aggregate, or by the private sector of $100 million or more (adjusted annually for inflation) in any one year.

This rule does not meet the thresholds of the Act. Therefore, the requirements of Title II of the Act do not apply.

Conclusion

For the reasons discussed in the preamble, and based on the findings in the Regulatory Flexibility Determination and International Trade Impact Analysis, the FAA has determined that this regulation is not significant under Executive Order 12866. In addition, the FAA certifies that this rule will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. This regulation is not considered significant under DOT Order 2100.5, Policies and Procedures for Simplification, Analysis, and Review of Regulations. A final regulatory evaluation of the regulation, including a final Regulatory Flexibility Determination and International Trade Impact Analysis, has been placed in the docket. A copy may be obtained by contacting the person identified under FOR FURTHER INFORMATION CONTACT.

List of Subjects in 14 CFR Part 21

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends 14 CFR part 21 of the Federal Aviation Regulations as follows:

The authority citation for part 21 continues to read as follows:

Authority: 42 U.S.C. 7572; 49 U.S.C. 106(g), 40105, 40113, 44701-44702, 44707, 44709, 44711, 44713, 44715, 45303.