GOVERNMENT/INDUSTRY AERONAUTICAL CHARTING FORUM
Instrument Procedures Group
May 4-5, 1998
HISTORY RECORD

FAA Control # 98-01-197

SUBJECT: Air Carrier Compliance with FAA-specified Climb Gradients

BACKGROUND/DISCUSSION: Unlike balanced runway and takeoff engine failure computations, air carriers are not required by the FAA to provide flight crews with performance data to determine whether an a normally operating aircraft can make good the climb gradient specified on an instrument departure procedure. Not only do crews need these data in a form that can easily be used just prior to departure, the crews need to know the optimum flight profile to be used to assure that the presumed performance is achieved during the departure procedure.

In many cases, air carrier aircraft performance is sufficiently robust as to implicitly assure that specified climb gradients are exceeded simply by flying the nominal departure profile. But, this assumption is not valid at terrain-critical locales, where steep gradients must be maintained for several thousand vertical feet. Unless the FAA mandates an objective, valid performance-calculation program for air carriers, sooner or later a CFIT accident will occur at a mountain airport, which could have been prevented had a requirement been in place to assure compliance with the specified climb gradient under actual density altitude and aircraft takeoff weight conditions.

RECOMMENDATION: ALPA met with AFS-200, 400 and AGC-200 August 5, 1997, and set forth this issue. The FAA thus far has failed to respond to ALPA's legitimate safety-of-flight concerns. On January 6, ALPA requested a legal interpretation on the matter of climb gradients, a copy of which is attached to this agenda item. AFS-200 should act immediately to require certificate holders to provide flight crews with climb-gradient-performance calculation tools, including the required flight profiles for a given departure procedure.

COMMENTS: This affects the standard operations specifications and directive/training material provided to air carrier flight crews.

Submitted by Captain Tom Young, Chairman
Charting and Instrument Procedures Committee
AIR LINE PILOTS ASSOCIATION
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April 22, 1998

attachment

January 6, 1998

Mr. Nicholas Garaufis
Office of the Chief Counsel, AGC-1
Federal Aviation Administration
800 Independence Avenue, SW
Washington, DC 20591

Subject: Request for Legal Interpretation

Dear Mr. Garaufis:

The Air Line Pilots Association is requesting that you provide us with a legal interpretation about whether air carrier operators (operating under either 14 CFR Parts 121 or 135) are required to assure that aircraft taking off and departing an airport under Instrument Flight Rules (IFR) can comply with climb gradients set forth in published IFR departure procedures or standard instrument departure procedures (SID). Further, we need you to clarify your November 30, 1993, legal interpretation that indicates that a published IFR departure procedure must always be used by a pilot under Part 121 or 135, even where a SID exists for the airport and such a SID is assigned by ATC to a departing air carrier aircraft.

In your letter of legal interpretation to Mr. McBride and Mr. Birdsong, dated November 30, 1993, you set forth the absolute requirement for 14 CFR 121/135 operators to use published IFR departure procedures, and we quote:

"Under Part 121 or Part 135, a pilot is required to follow any published IFR departure procedure regardless of whether the flight is conducted under VMC or under IMC."

Many IFR departure procedures and SIDs contain specified climb gradients in addition to a specific flight track. A few examples are:

1. Reno, Nevada (KRNO) IFR departure procedure for Runway 16L: Minimum climb gradient of 510 feet per nautical mile to 8,500 feet, msl. (4,095-foot altitude gain required with specified climb gradient.) Aircraft that can make good the specified climb gradient are authorized standard (and by operations specifications, lower-than-standard) takeoff minimums. Aircraft that cannot make good the specified climb gradient are required to have a takeoff weather condition of not less than a ceiling of 3,600, visibility 2 miles.

2. Eagle, Colorado (KEGE) IFR departure procedure for Runway 25: Minimum climb gradient of 750 feet per nautical mile to 11,200 feet, msl. (4,744-foot altitude gain required with specified climb gradient.) Aircraft that can make good the specified climb gradient are required to have a takeoff weather condition not less than a ceiling of 1,700, visibility 3 miles. Aircraft that cannot make good the specified climb gradient are required to have a takeoff weather condition not less than a ceiling of 5,300, visibility 3 miles.

3. Los Angeles, California (KLAX) GABRE SID for Runways 6L/R and 7L/R: Minimum climb gradient of 330 feet per nautical mile to 12,000 feet, msl. (Approximate 11,900-foot altitude gain required with specified climb gradient for all

referenced runways.) There are no alternative takeoff minimums on this SID for aircraft that cannot make good the specified climb gradient.

In Example 3, the climb gradient is mandatory without exception, because the departure is a SID. Most SIDs do not have alternative takeoff minimums without climb gradient.

Examples 1 and 2 are IFR departure procedures, with alternative high weather minimums for aircraft that cannot comply with the specified climb gradient. However, the FAA has never provided guidance to the aviation community about how to avoid controlled flight into terrain (CFIT) at mountain-area airports where a specified climb gradient cannot be complied with. In any case, the air carriers presume that their pilots will depart with the lowest possible takeoff minimums. Thus, for both the CFIT and economics-of-operations issue, the higher minimums are for all practical purposes useless.

14 CFR, Parts 121.189 and 135.379, require FAR 121 and 135 operators, dispatch departments and pilots to calculate the aircraft's performance capabilities to comply with a narrow, hypothetical takeoff flight path which is 600 feet wide, and extends to the point where the aircraft reaches 1,500 feet above departure end runway elevation. Pilots are provided with the necessary aircraft performance data to compute this takeoff flight path, which terminates once the aircraft has gained 1,500 feet of altitude, well short of the 11,900' at LAX in the example above. This calculation serves to determine whether sufficient runway is available for takeoff, whether the aircraft can safely abort the takeoff in event of an engine failure below the critical engine failure speed, and whether the aircraft can make good the 14 CFR 25-defined takeoff flight path to 1,500 feet, in the event of an engine failure. Further, flight crews are trained at every recurrent and proficiency training session on the correct power settings and flight profile to be used to assure that the assumed performance data will assure compliance with the 14 CFR25-defined takeoff flight path to 1,500 feet of altitude gain.

There is not, however, any FAA regulatory requirement or other FAA air-carrier-oversight function requirement that operators, dispatch departments, or pilots determine whether aircraft performance capabilities exist to comply with sustained climb gradients well above a 1,500-foot altitude gain, even with the normal operating condition of all engines operating. Further, there is no training or instruction given to flight crews about the required power settings and vertical flight profiles required to achieve climb gradients for several thousands of vertical feet, such as set forth in our three examples earlier in this letter.

Our specific questions are:

1. Are climb gradients published in IFR departure procedures and SIDs merely guidelines, or is adherence to them mandatory when either a SID is assigned or an IFR departure procedure is used?

2. If adherence to such climb gradients is mandatory, are air carrier operators and flight dispatch departments required to provide flight crews with airport and runway-specific performance data and required vertical flight profiles to be flown to assure making good the specified climb gradient for each particular IFR departure procedure or SID to be used, assuming all engines operating?

3. Absent the air carrier providing flight crews with airport and runway-specific performance data and required vertical flight profiles to be flown to assure making

good the specified climb gradient for each particular IFR departure procedure or SID to be used, what is the FAA-approved departure flight maneuver that will assure legal compliance with an IFR departure procedure's or SID's specified climb gradient?

4. If an operator or pilot elects to use a higher-than-standard takeoff ceiling and visibility minimum as an alternative to an IFR departure procedure's specified climb gradient, what is the FAA-approved maneuver required to assure legal compliance with the higher minimum?

5. In view of the seemingly absolute mandatory language of your November 30, 1993, letter of legal interpretation, is it legal for a Part 121 or 135 pilot to use an ATC-assigned SID instead of a published IFR departure procedure for an airport that has both SIDs and a published IFR departure procedure?

Thank you for your consideration of our request for these legal interpretations and related information.

Sincerely,

Tom Young, Chairman
Charting and Instrument Procedures
Committee

TY:amr

cc: P. Lane, AGC-230
Q. Smith, AFS-200

INITIAL DISCUSSION (Meeting 98-01): This issue was presented by Tom Young on behalf of ALPA. They expressed concern that air carriers are not required by the FAA to provide flight crews with performance data to determine whether a normally operating aircraft can make good a climb gradient specified on an instrument departure procedure. ALPA had previously requested a legal interpretation of this issue and provided a copy of their request to the group. ALPA believes this affects the standard operations and specifications and directive/training material provided to flight crews. ALPA also believes this to be a potential CFTI issue and cited examples of situations at Minneapolis. Paul Smith, NBAA, stated that this should not be an ACF issue. Bob Wright, AFS-400, suggested the issue be brought before a FAA safety commission. Item to be held over pending assignment of an OPI. Howard Swancy (AFS-420) has initially taken the issue to AFS-200 (Dave Cady) as a possible FSIB item. Action: AFS-420.

MEETING 98-02: Howard Swancy, co-chair, proposed a meeting with AFS-420, AFS-200, ALPA and AGG to address this issue. Tom Young, ALPA, briefed that there was an FAA/AFS-400 commitment made during a meeting on August 5, 1997. Tom also emphasized AFS-200 participation. Kevin Comstock, ALPA, stated that he had spoken with AFS-200 and they don't believe this is a problem on public procedures and is handled on a case-by-case basis on special procedures. AFS-200 is working on a FSIB; however, it is not

mature enough to circulate for comment. It has also being worked as a low priority item. In short, no action has been taken to resolve this issue. Action: AFS-200.

MEETING 99-01: Jim Gardner, AFS-200 briefed that no action has been taken on this issue due to personnel constraints and changes. Tom Young, ALPA, re- briefed their concern and offered to meet with AFS-200 to re-emphasize the problem and to volunteer industry assistance in the solution. AFS-200 agreed to more aggressively work the issue with ALPA input. Action: AFS-200.

MEETING 99-02: An AFS-200 representative was not available to address this issue. Will Swank, AFS-200, was in attendance for the P-56 airspace issue and was tasked to request the AFS-200 representative assigned this issue to forward a status update on initiatives thus far for inclusion in the minutes. He agreed to convey the message. Wally Roberts, ALPA, briefed that his organization has sent a letter to a higher level expressing concern that the issue is not being actively pursued. Action: AFS-200.

MEETING 00-01: Will Swank, AFS-200, reported that the AFS-200 specialist assigned this issue was transferred and that no action has been taken. He stated that AFS-200 agrees with the importance of the issue as presented; however, staffing constraints have precluded action. Kevin Comstock, ALPA, is still working their organization internally to assess impact on their customers. Action: AFS-200.

MEETING 00-02: An AFS-200 representative was not present to discuss the issue. Discussion is continued to the next meeting. Action: AFS-200.

MEETING 01-01: An AFS-200 representative was not present to discuss the issue. Discussion is continued to the next meeting. Action: AFS-200.

MEETING 01-02: An AFS-200 representative was not present to discuss the issue. Discussion is continued to the next meeting. Action: AFS-200.

MEETING 02-01: Jim Gardner, AFS-200, responded to the issue and was provided an update by Wally Roberts, ALPA. Wally re-stated that the FAA has no requirement for operators to provide performance data to be in the cockpit. Jim provided a short briefing on POI requirements and procedures for Part 121/135 operators and stated that AFS-200 has had no time or resources to address this particular issue. Wally briefed that ALPA had also raised the issue with FAA's General Council in 1998, but has received no response. Jim suggested that ALPA follow up that correspondence which could elevate the issue in AFS-200. Wally agreed to do so. Action: ALPA & AFS-200.

MEETING 02-02: Dave Kountz, a newly assigned specialist on detail from the Pittsburgh FSDO to AFS-220, stated that he will pursue the issue. He will attempt to prod AGC for a

response to the ALPA letter of 1998. Dave is also an assistant POI for US Airways and will use this position to also try to determine the actual impact on air carriers. It is also recommended that ALPA continue to follow up their AGC letter for response.
ACTION: AFS-220 and ALPA.

MEETING 03-01: There was no AFS-200 representative at the meeting to update the issue. ALPA has had no further success in getting a response from AGC-200. Status unchanged.
ACTION: AFS-220 and ALPA.