AERONAUTICAL CHARTING FORUM
Instrument procedures Group
April 29-30, 2002
HISTORY RECORD

FAA Control # 02-01-239

Subject: Minimum Vector Altitude (MVA) Obstacle Accountability; Lack of Diverse Vector Area (DVA) Criteria

Background/Discussion: During ALPA's review of the DP problems at San, Jose, California, we discovered that an OE-evaluated tower located on a mountain northeast of the airport violated MVA required obstacle clearance ("ROC"). The ensuing exchange with AT and AVN-100 revealed two issues: 1. AVN-100 states that determination of MVAs rests with local and regional ATC entities. 2. FAA ATC management in Washington asserts that any tower that does not appear on the applicable Sectional Aeronautical Chart need not be considered for MVA obstacle clearance purposes. In the circumstances at San Jose, when taking the tower height, with its associated accuracy code, the MVA may be as much as 300 feet shy of 1,000 feet of ROC. Further, according to AVN-100, MVA ROC is always rounded down instead of to the nearest 100 feet.

ALPA submits that an aircraft altimeter does not know when it is being radar vectored.

Another related issue that we submit as part of the this agenda item is the lack of any criteria for radar-vector diverse vector areas ("DVA") although the AIM asserts (excerpt attached) that pilots, when vectored below the MVA (permitted only on departure and missed approach) will always be vectored in a 40:1-clear DVA.

Because of an area of concern ALPA brought before ATPAC last year, the ATC 7110.65 Handbook, Paragraph 5-6-3, is being revised (change notice language attached) to make it clear that a departing or missed approach aircraft cannot be vectored below MVA except for the initial MVA area that overlies the departure end of the runway. 40:1-clear DVAs could be implemented at many locations to provide a safe exception to sustained vectors below the MVA. During our study of the MVA chart at San Jose, California we noted that vectors for departures and missed approaches to the southeast will become problematic for many aircraft because there is simply not room to apply delay vectors to assure MVA prior to entry into the next higher MVA sector. (Illustration attached.)

Recommendation: It is ALPA's view that Flight Standards Service is the sole safety and flight operations domain within the FAA charged with obstacle clearance for any and all instrument flight procedures, including MVA charts. Although ATC should fairly determine the boundary and "flow" of MVA charts, the determination of obstacle clearance therein should belong solely to AFS, as applied by AVN. This is no different than the concepts used for ATC DPs.

Further, Flight Standards should expeditiously develop long-overdue radar-vector DVA criteria, using valid scientific principles.

Comments: This affects TERPs criteria, the Aeronautical Informational Manual, and pertinent ATS and AFS policies and areas of responsibility.

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Proposed change to 7110.65 that has been circulated to ATC facilities:

Vectors Below Minimum Vectoring Altitude

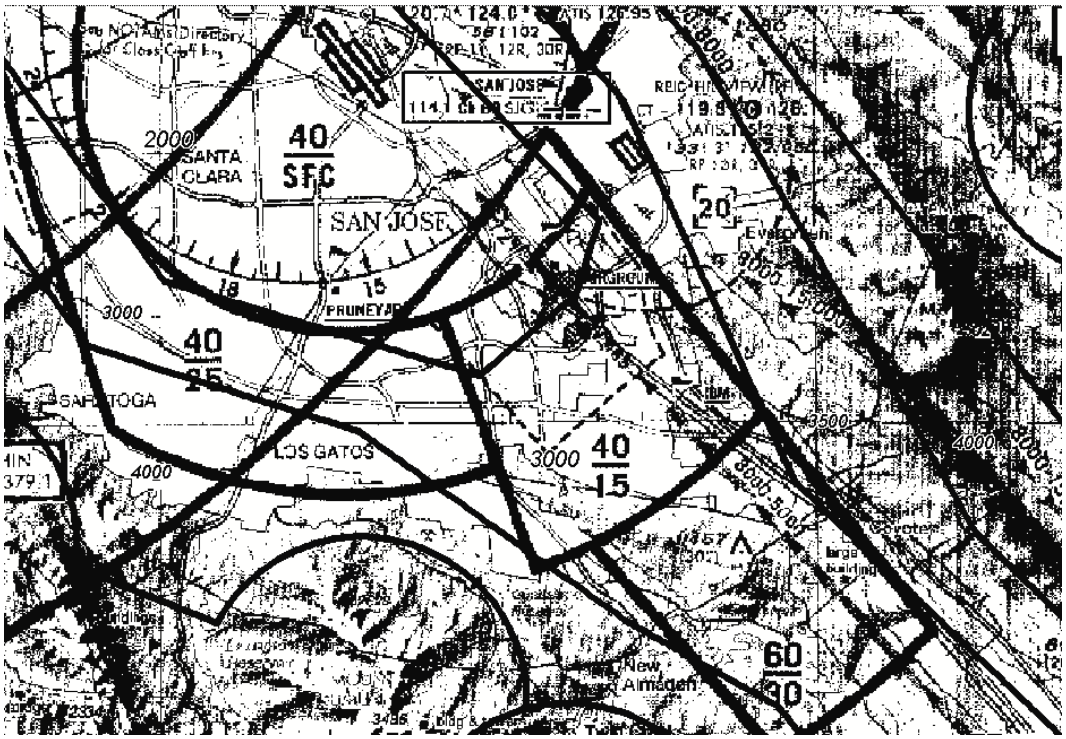
/*TER/ Pilots are always responsible for terrain separation. However, when an air traffic controller assigns a departure procedure or control instructions involving altitude assignments, pilots expect that compliance with those instructions will provide terrain separation.

A pilot has no immediate knowledge of the minimum assignable altitude since ATC may utilize diverse vector areas, minimum vectoring altitudes, and other altitudes authorized by FAAO 7110.65, Air Traffic Control. Paragraph 5-6-1 authorizes a controller to vector departing IFR aircraft at or above the minimum vectoring altitude or the minimum IFR altitude except as authorized for radar approaches, special VFR, VFR operations, or by Paragraph 5-6-3, Vectors Below Minimum Altitude. Paragraph 5-6-3 allows controllers to vector IFR aircraft below minimum IFR altitude (MIA), but only when specific requirements have been met.

When controllers vector or assign headings to IFR aircraft below minimum IFR altitude, the FAA assumes responsibility for terrain separation. Controllers may only vector aircraft, assign direct, or a climb on course when the aircraft has reached MIA or when terrain and obstruction clearance is being otherwise assured. FAAO 7110.65 Paragraph 5-6-3, Vectors Below Minimum Altitude, describes how this may be accomplished when vectors will be provided. (ATP120).

Reference in AIM to DVAs:

AIM 5-2-6c2. ATC may assume responsibility for obstacle clearance by vectoring the aircraft prior to minimum vectoring altitude by using a diverse vector area (DVA). The DVA has been assessed for departures that do not follow a specific ground track. ATC may also vector an aircraft off a previously assigned DP. In all cases, the 200 FPNM climb gradient is assumed and obstacle clearance is not provided by ATC until the controller begins to provide navigational guidance in the form of radar vectors.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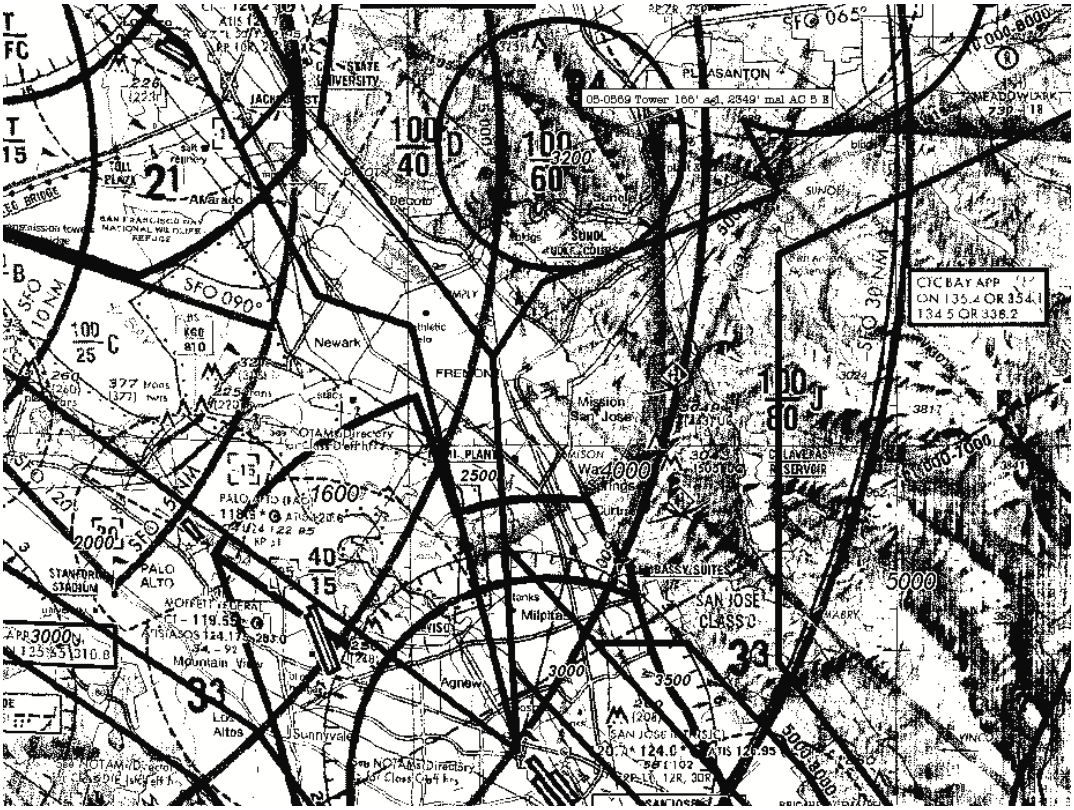
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INITIAL DISCUSSION (Meeting 02-01): New Issue presented by Wally Roberts, ALPA. Wally expressed concern that not all obstructions are accounted for in determining the MVA and therefore some MVAs are invalid. ALPA acknowledges that MVA chart (MVAC) design must remain under the purview of air traffic; however, the final MVA altitude for obstruction clearance must be validated by AVN under AFS policy guidance. Wally noted that MVACs are the most critical element used for obstruction in ATC today and should be made available to pilots, yet they are nearly impossible for the public to obtain. Marty Walker, ATP-120, noted that MVACs are owned by air traffic and public availability will have to be addressed through AAT. Wally further suggested that MVACs should be processed under 97 as SIAPs are, or as a Part 95 altitude. Wally then noted the variance between the 3 NM radar obstacle clearance within 40 NM of the radar antenna and the 4 NM pilot obstacle clearance requirement of Part 91.177. He also mentioned the Part 91.177 absolute 1000/2000 obstacle clearance requirements for pilots. MVAs, in many cases, allow reduction to the 2000' designated mountainous area ROC requirement "…to achieve compatibility with terminal routes or to permit vectoring to an IAP". These variances allow pilots to unwittingly violate Part 91.177 when accepting a radar vector. Bill Hammett, AFS-420 (ISI), expressed that while MVAC design policy must remain within Air Traffic's realm, criteria for MVAC obstacle clearance should be expanded in TERPS and that the 200'AGL Assumed Adverse Obstacle concept should be a mandatory requirement to ensure obstacle clearance. Insofar as Wally's concern over the lack of diverse vector area (DVA) criteria, Norm LeFevre, AFS-420, responded that this criteria is in TERPS Change 19. ALPA will continue to address MVAC availability through AAT. Norm LeFevre took the IOU for AFS-420 to coordinate with AGC to determine whether MVACs should be processed under Part 95/97 and to consider expanding MVAC criteria in TERPS. ACTION: ALPA and AFS-420.

MEETING 02-02: Mark Ingram, ALPA, briefed that ALPA has had success in obtaining the Minimum Vectoring Altitude Chart (MVAC) files it requested through a FOIA. Earlier in the meeting, Mark provided an "Errant Vector" briefing (see item 3c) that demonstrated the use of MVACs in the cockpit as a CFIT preventative measure. The presentation also highlighted ALPA concerns in the current development, review, and approval process for MVACs. Specific examples of MVACs were displayed showing charts with improper vertical and lateral obstruction clearance, possible unnecessary ROC reductions in designated mountainous terrain areas, and sector design deficiencies. Mark stated that ALPA is also planning to seek that MVAs and MIAs be incorporated under PART 95 or 97. Bill Hammett, AFS-420 (ISI), stated that the rulemaking process may not be a good idea for MVACs. If public availability is the primary goal, then that could be accommodated via other means. However, he agreed that there needed to be a cross-reference to radar vectors in Part 91.177. Bill further briefed that both AVN-160 and AFS-420 have begun looking at the issue of MVAC errors. AFS-420 has drafted new criteria for MVAC development for inclusion in TERPS. The new criteria will provide more comprehensive, standardized guidance for MVACs. The draft criteria were presented to the TERPS signatories on October 2nd, 2002 at the bi-annual TWG meeting. The draft criteria will be revised to accommodate comments received and then begin internal FAA coordination with AAT and AVN. It is planned to include these criteria in TERPS Change 20. AVN-500 has been tasked to look at developing an automated tool to assist air traffic facilities in developing MVACs and to aid AVN-100 in the review approval process. The Sectional Chart, which is currently specified by policy as the map source for MVACs, came under much criticism. Charles Branch, AVN-510, responded that the Sectional Chart is an excellent tool for which it was developed, VFR flight. It was not intended to be a detailed terrain and obstacle source for TERPS work. Bill stated that Sectional Charts were originally specified, as they are the only chart that depicts the floor of controlled airspace. More detailed topographic charts such as Joint Operations Graphics (JOG) are scaled 1:250,000 are better suited to evaluate terrain over large areas, and even more detailed maps should be used when needed. Chart scale will be considered as policy is revised. ACTION: AFS-420, AVN-160 and AVN-500.

MEETING 03-01: Bill Hammett, AFS-420 (ISI), briefed that new criteria for minimum vectoring altitude chart (MVAC) development have been written for inclusion in TERPS Change 20. The criteria are currently undergoing internal coordination within ATP-100. Improved criterion is the first step in resolving the obstruction clearance portion of this issue. Bill also briefed that AVN-41 has undertaken an initiative to automate the MVAC review/approval process. *(**Note:** A briefing on the proof-of-concept and progress of the automation development process thus far was presented at the Charting Group portion of the ACF.)* In the interim, Brad Rush, AVN-101, stated that QC has been enhanced on MVAC reviews by AVN-100. Steve Bergner, NBAA, briefed that his organization sent a letter jointly to ATS-1 and AVR-1 requesting that MVA and MIA charts be placed under Part 95 to resolve the separation contradictions between the MVA criteria and Part 91.177, and that MVA and MIA charts be made available to the public for moving map displays. Steve briefed that Mr. Steven Brown, ATS-1, responded that new MVAC criterion for TERPS is under development; however, the public availability of MVA and MIA charts issue is still under review. The Part 91.177 and Part 95 issues were not addressed in the ATS-1 response. Kevin Comstock, ALPA, asked about the possibility of obtaining MIA charts. Pat Fair, ATA-130, responded that the MIA charts are now developed using ARTCC automation equipment and differ from Center to Center. Bill stated that the current Order 7210.37 requires MIA charts be developed using Sectional charts and asked if policy had changed. Pat responded that this process is no longer being followed. Unfortunately, there was no Air Traffic representative present to address the issue. Three IOUs were assigned: 1) AFS-420 will continue to develop MVAC criteria for TERPS; 2) ATP-100 will provide comments on the draft MVAC criteria; and, 3) AVN-41 will continue work on the automation tool for MVAC review. ACTION: AFS-420, ATP-100, & AVN-41.