U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Air Traffic Organization Policy

ORDER JO 7210.37E

Effective Date:
April 1, 2011

SUBJ: En Route Minimum Instrument Flight Rules (IFR) Altitude (MIA) Sector Charts

1. Purpose of This Order. This order establishes procedures and criteria to develop MIA sector charts for en route air traffic facilities.

2. Audience. This order applies to the following Air Traffic Organization (ATO) service units: En Route and Oceanic and Mission Support; associated service center offices; William J. Hughes Technical Center; Mike Monroney Aeronautical Center; and air route traffic control centers (ARTCC).

3. Where Can I Find This Order? This order is available on the MyFAA employee Web site at https://employees.faa.gov/tools_resources/orders_notices/.

4. Cancellation. This order cancels Order JO 7210.37D, effective June 15, 2010.

5. Scope. This order establishes procedures and criteria to develop MIA sector charts for en route air traffic facilities operating within the scope of the HOST automation platform. En Route facilities transitioning to the En Route Automation Modernization (ERAM) platform will establish and/or revise MIA sectors in accordance with the individual facility's ERAM transition plan.

6. Explanation of Change. This change deletes paragraph 7 a (4); "Each MIA area must have the terrain/obstruction feature that constitutes the basis for the MIA, in addition to its elevation, highlighted in such a manner that would allow it to be easily found by a controller, but not clutter the MIA chart. Large MIA areas with irregular or precipitous or multiple obstructions may have more than one elevation highlighted." It has been determined that this information provides little to no operational benefit to air traffic controllers and sometimes can actually provide confusing information. The change also updates new Mission Support Services organizations.

7. Procedures. Each air route traffic control center (ARTCC) must develop and maintain MIA sector charts using the Sector Design and Analysis Tool (SDAT). Use the SDAT derived FAA Form 7210-9 for facility status accounting and Mission Support Services – ATC Products Group chart data review and approval. At a minimum, the airspace considered for providing obstacle clearance information on MIA charts must accommodate the lateral limits of the facility's delegated area of control as well as adjacent airspace where control responsibility is assumed because of early handoff or track initiation. Divide the MIA sector charts into areas (referred to as MIA areas) as required in order to accommodate different MIAs without respect to air traffic control (ATC) sector or facility boundaries, as described below.

a. MIA Sector Charting Criteria.

(1) Establish the lateral boundaries of MIA areas and determine the MIA by:

(a) Using SDAT and FAA Order 8260.3, United States Standard for Terminal Instrument Procedures (TERPS). The Mission Support Services, Aeronautical Navigation Products

Group (AeroNav Products) oversees the SDAT program and provides user support. Use of sectional charts is limited only to determining the floor of controlled airspace.

NOTE-
MIAs are established irrespective of the flight-checked radar coverage in the sector concerned. They are based on obstruction clearance criteria and controlled airspace only. It is the responsibility of the controller to determine that a target return is adequate for radar control purposes.

(b) Using geographical points defined by latitude and longitude to the nearest second.

(c) Addressing operational requirements where possible; for example, normal traffic flows, minimum en route altitudes (MEAs) where lower than the MIA, areas where vectoring to approaches is required, etc.

(d) Establishing MIA area boundaries a minimum of 5 NM from all terrain/obstructions that would impact the MIA. The obstacle evaluation area for a given sector includes a 5 NM buffer outside the MIA area boundary except where such terrain/obstructions are located within 5 NM of the lateral limits of an air traffic services (ATS) Route. For the latter, the limits of the ATS Route will serve as the associated MIA area boundary.

(e) Applying appropriate 5 NM buffer at ARTCC and MIA area boundaries.

(f) Applying the appropriate mountainous or non-mountainous obstruction clearance criteria per FAA Order 8260.3, Chapter 10. Round sector altitudes up to the nearest 100-ft increment to ensure the required obstacle clearance (ROC) are established within the sector and associated buffer area. Apply 1,000 ft ROC over obstacles in non-mountainous areas. Apply 2,000 ft ROC over obstacles in designated mountainous areas. ROC must only be reduced when a reduction has been requested, documented, and approved in accordance with the provisions of this order. Authorized ROC reductions per JO 8260.3 are:

(i) Single sensor adaptation: Not less than 1,000 ft.

(ii) Multi-sensor adaptation:

(aa) Terrain. Not less than 1,500 ft (designated mountainous areas of the eastern United States, Commonwealth of Puerto Rico, and Hawaii) or 1,700 ft (designated mountainous areas of the western United States and Alaska).

(bb) Man-made obstacles. Not less than 1,000 ft over the obstacle, but the MIA must also provide the minimum required 1,500/1,700 ROC over the terrain underlying the man-made structure.

(g) Making requests for reduced ROC in an area designated as mountainous in accordance with Title 14 of the Code of Federal Regulations (14 CFR), Part 95, Subpart B, must conform to the following procedures:

(i) Designated mountainous terrain must be evaluated for precipitous terrain characteristics and the associated negative affects. Facility managers must use FAA Order 8260.3, paragraph 1720, as a guide when considering ROC reductions in designated mountainous areas. ROC reductions are not authorized where negative effects of precipitous terrain are documented or known having followed the process contained in paragraph 7a(1)(g)(ii) and (iii) below. ROC reductions within designated mountainous areas not containing precipitous terrain are only authorized by complying with at least one of the following criteria:

REFERENCE-
FAA Order 8260.3, Appendix 1, Glossary Term, Precipitous Terrain

(aa) Where lower altitudes are required to achieve compatibility with terminal routes.

(bb) To permit vectoring within the airport radar traffic pattern area for either a departure procedure, an instrument approach procedure, or a visual approach to an airport. Air traffic managers must define each airport's radar traffic pattern area within which ROC reductions are sought. These areas must include sufficient maneuvering airspace necessary for ATC sequencing and spacing of traffic in the vicinity of an airport.

(ii) Where mountainous terrain has been deemed precipitous by the air traffic manager, each ROC reduction request must include a query to an independent data source, such as National Aeronautics and Space Administration's Aviation Safety Reporting System to determine if any ground proximity warnings have been reported in the subject area. After completing the query, consider the facility's history and experience with turbulence at the minimum altitude requested. Avoid ROC reductions where reported ground proximity warnings relate to both existing MIA sector altitude ROC reductions and rapid terrain elevation changes. ROC reduction requests in these areas may require additional evaluation and review.

REFERENCE-
FAA Order 8260.3, Appendix 1, Glossary Term, Precipitous Terrain

(iii) The facility MIA package must include a detailed account of the steps taken by the facility to determine if the sector will qualify for taking a ROC reduction in the sector. This data will be reviewed by Mission Support Services – ATC Products Group personnel for ROC reduction approval. Previously approved reductions in ROC justification must be resubmitted for approval during a facility's recurring certification process.

(h) Considering revising sector boundaries, when a sector/buffer/isolation area overlies both non-mountainous and mountainous terrain. Otherwise, apply the appropriate ROC based on the location of the obstacle.

(i) Applying AAO to terrain except those areas around primary/satellite airports exempted by FAA Order 8260.19 and/or where applying 2,000 ft unreduced ROC.

(j) Rounding resultant MIA sector altitudes to the nearest 100' increment (for example, 3,049 rounds to 3,000) **only** when an AAO is the controlling obstacle for a sector and an operational need is demonstrated and documented (for example, altitude is necessary to support vectoring to the ILS glideslope), provided the minimum ROC is maintained for other non-AAO obstacles.

NOTE-
When an operational need has been demonstrated, it must be documented on FAA Form 7210-9, Remarks section.

(k) Requesting to waive criteria contained in FAA Order 8260.3, if necessary. Submit FAA Form 8260-1, Flight Procedures/Standards Waiver in conjunction with the MIA SDAT project submission. This waiver form will contain the criteria requested to be waived, the operational need fully explained, and examples of how the facility will achieve an equivalent level of safety if approved. The waiver package will also include the SDAT-derived FAA Form 7210-9. For the Flight Standards Waiver process, facility managers do not need to complete a Safety Management System evaluation.

(l) Ensuring the depicted MIA is at least 300 feet above the floor of controlled airspace. Sectional charts are currently the only medium that identifies the floor of controlled airspace. Do **NOT** include buffer areas for controlled airspace evaluations.

NOTE-
1. *In some cases, controlled airspace application will result in an exceptionally high MIA; (e.g., in areas where the floor of controlled airspace is 14,500 MSL). When operationally required to provide air traffic control*

service in underlying Class G (uncontrolled) airspace, two MIAs may be established. The primary MIA must be based on obstruction clearance and the 300' floor of controlled airspace buffer. A second, lower MIA, that provides obstruction clearance only, may be established only for those instances when air traffic control is allowed to vector or provide service in uncontrolled airspace. The additional obstruction clearance MIA must be uniquely identified on the chart; e.g., by an asterisk (*).

2. *The existence of an MIA in uncontrolled airspace relates to terrain/obstruction clearance only; it does not constitute authority to conduct IFR operations within uncontrolled airspace.*

REFERENCE-
FAA Order JO 7110.65, Section 5-6, Vectoring

(m) Adapting an airway or an appropriate block of airspace containing an airway as a separate MIA area to preclude En Route-Minimum Safe Altitude Warning (E-MSAW) nuisance alerts when that airway is below an adjacent MIA area altitude. MEAs must be obtained from en route low altitude charts and thus become the adapted E-MSAW alerting altitude for an MIA area that defines an airway. Since radar vectoring along an airway, or radial thereof, requires greater lateral obstruction/terrain clearance than would normally be imposed on a flight that has been specifically cleared via the airway, an independent check must be made to ensure that vectoring within an MIA defined airway would not result in reduction of the appropriate clearance criteria.

(2) Where small contiguous MIA areas with different altitudes do not serve an operational need, combine them using the highest applicable MIA.

(3) To avoid a large MIA area with an excessively high altitude due to an isolated prominent obstruction, enclose the obstruction within its own MIA area. When the isolated obstruction is terrain, evaluate related slopes or ridge lines to ensure appropriate obstruction clearance criteria are applied.

(4) MIA areas should be labeled with respect to the E-MSAW area identification criteria. The identifier has three letters and two digits (LLLdd), to identify areas relative to significant geographical points or fixes.

(5) SDAT must be used in preference to manual methods to reduce the risk of human calculation or drawing errors. Facility managers may request assistance in the development and maintenance of their MIA Charts or request SDAT user training and support by soliciting the Mission Support Services - Aeronautical Information Management Office.

(6) In the advent of the development of an automated precipitous terrain algorithm certified by AFS, the automated method will be used in lieu of the manual method described in Para 7a(1)(g)(ii) and (iii) above.

b. MIA Sector Chart Display. Applicable portions of the facility's MIA chart must be displayed at each low altitude sector. This MIA sector chart must accommodate operational requirements for the sector involved. Air traffic managers must determine the appropriate method for displaying this information at the sector. MIAs must be displayed with each associated MIA area. For an airway adapted as a MIA area:

(1) If the MEA is sufficient for vectoring, the MIA and the MEA must be depicted as one altitude for that area.

(2) If a higher altitude is required for vectoring, then both the adapted E-MSAW alerting altitude (MEA) and the vectoring altitude must be displayed on the MIA sector chart, associated with the proper area, and separated by a slash (for example, 90/70). Each sector chart or facility directive must contain an explanation of these split altitudes to the effect that:

(a) The higher altitude on the left of the slash is the appropriate altitude for off-airway operations (radar vectoring).

(b) The lower altitude to the right of the slash is the adopted E-MSAW alerting altitude.

c. MIA Sector Chart Processing. Process MIA charts and ROC reduction requests per Order 8260.19 criteria as follows:

(1) Each submission must indicate the MIA was accomplished in SDAT and stored in the SDAT Repository on the facility's cover letter. Using SDAT, prepare an FAA Form 7210-9 with the manager's signature and point of contact at the submitting facility. Use the REMARKS column for explanation of any ROC reduction and AAO additive rounding requests. The completed Form 7210-9 must be an electronic copy with the manager's signature and imported into the MIA project file.

(2) Forward the signed cover letter, signed FAA Form 7210-9, and any documentation or waivers requests to Mission Support Services – ATC Products Group for review and certification. All information sent to Mission Support Services – ATC Products Group, whether a hard copy or soft copy, is also to be included in the MIA SDAT project file. Mission Support Services – ATC Products Group, upon approval, will forward an approval letter to the facility.

(3) Submit MIA charts for review periodically but not to exceed 24 months and submit change packages as they occur.

(4) Monitor available sources including the weekly National Flight Data Digest (NFDD) pertaining to construction notices that may affect specific MIA areas. When needed, revise the affected charts.

(5) Verify that the altitude information adapted in the National Airspace System (NAS) E-MSAW polygons agree with the MIA sector charts.

8. Distribution. This order is distributed to the following Air Traffic Organization (ATO) service units: En Route and Oceanic, Terminal, Mission Support, and System Operations; all associated air traffic control facilities; the FAA William J. Hughes Technical Center; and Mike Monroney Aeronautical Center.

9. Background. There has been a requirement for facilities to determine and display the controlling obstacle along with the elevation of the obstacle for each MIA sector so it can be easily found by a controller. It has been determined that this information on the controlling obstacle is of no practical use to controllers; therefore, the requirement is being deleted from the order.

10. Safety Risk Management. The particular requirement to display the controlling obstacle along with the elevation of the obstacle has been determined to provide little to no operational safety benefit to controllers or operators. Controllers will continue to have available all MIAs that provide the required ROC and this has not changed.

D Borlenhemer

for Luis A. Ramirez,
Director, En Route and Oceanic Safety and
Operations Support