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

ORDER
JO 7210.37H

Effective Date:
January 3, 2019

SUBJ: En Route Instrument Flight Rules (IFR) Minimum 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 directive applies to the following Air Traffic Organization (ATO) service units: Air Traffic Services (AJT), Mission Support Services (AJV), System Operations Services (AJR), FAA contract ATC service providers, all ATC facilities, and select offices and services within Washington Headquarters.

3. Where Can I Find This Order? This order is available on the MyFAA employee website at https://employees.faa.gov/tools_resources/orders_notices/ and on the FAA website at http://www.faa.gov/regulations_policies/orders_notices/.

4. Cancellation. This order cancels FAA Order JO 7210.37G, effective July 16, 2012.

5. Explanation of Changes. FAA Order JO 7210.37H En Route Minimum Instrument Flight Rules (IFR) Altitude (MIA) Sector Charts contains the criteria that facilities use to calculate their MIAs. This order provides the procedures for MIA development for En Route air traffic control facilities. The changes from the previous order, FAA Order JO 7210.37G, are listed below.

- References and procedures for HOST have been removed
- References to Ocean 21 have been replaced with ATOP
- Reference to FAA Order JO 8260.3 paragraph 10-2-8, has been updated to 15-2-1
- References to AeroNav have been replaced with Radar Video Maps (AJV-5)
- References to En Route and Oceanic Safety and Operational Support (AJE-3) have been replaced with AJV-5
- References to Fixed Posting Area (FPA) have been replaced with Fixed Airspace Volume (FAV)
- References to SDAT Office have been removed, or replaced with AJV-5
- The steps outlined in Appendix A, for gathering data from the National Climatic Data Site, were updated to reflect the current process.
- A note was added to the ROC Reduction/Temperature Table to add clarity

6. Procedures. Each ARTCC must develop and maintain their MIAs by using Sector Design and Analysis Tool (SDAT). SDAT completes FAA Form 7210-9, creates the project, submits it to the Operations Support Group (OSG) and Radar Video Maps (AJV-5) for review and certification.

a. At a minimum, the airspace considered for providing obstacle clearance information on MIA charts must accommodate:

1. MEARTS/ATOP: 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.

2. ERAM: See Appendix B.

b. MIAs are established regardless of radar coverage. It is the responsibility of the controller to determine that a target return is adequate for radar control purposes.

c. Verify that the altitude information adapted in the National Airspace System (NAS) En Route-Minimum Safe Altitude Warning (E-MSAW)/Terrain Alert Volume (TAV) polygons agree with the MIA sector charts.

d. Establishing the buffers, lateral boundaries and names of the MIA:

1. Apply a minimum buffer of 5 NM.

2. Do not include a buffer area for evaluation of controlled airspace or an Air Traffic Service (ATS) Route. The lateral limits of these areas will serve as the associated lateral boundary.

NOTE−
Sectional charts are currently the only source that identifies the floor of controlled airspace.

3. MIA area names are used with respect to the E-MSAW/TAV area identification criteria and to identify areas relative to significant geographical points or fixes.

e. Establish the base altitude of the MIA by applying:

1. The appropriate mountainous or non-mountainous required obstacle clearance (ROC) criteria.

NOTE−
The location of the obstacle, in either mountainous or non-mountainous areas will determine the appropriate ROC for the whole area. If appropriate, the MIA area will include the associated buffer. When this occurs, consider revising the lateral boundary.

2. The requirements of controlled airspace:

(a) MIAs must provide a 300 ft buffer above the floor of controlled airspace.

(b) In some cases, the requirement to establish an MIA that is 300 ft above the floor of controlled airspace will result in an exceptionally high MIA; (e.g., in areas where the floor of controlled airspace is 14,500 MSL). When operationally required a second altitude that provides obstruction clearance only may be established. This Obstruction clearance altitude must be uniquely identified on the chart; i.e. an asterisk (*).

NOTE−
See Displaying a Facility MIA Chart for controlled airspace charting purposes.

3. ATS routes adapted as an MIA area. Facilities may adapt the Minimum En Route Altitude (MEA) as the En Route Minimum Safe Altitude Warning (E-MSAW) altitude to prevent nuisance alerts. In this case, use the following:

(a) The SDAT-calculated MIA altitude for the area is at or below the MEA. A single MIA altitude can be used for aircraft assigned the airway and those aircraft on a direct route or being vectored.

Example– *The MEA for the airway is 2,000 ft. The SDAT calculated MIA altitude for the area is 1,900 ft. In this case a single MIA altitude of 1,900 ft may be used for aircraft assigned the airway, on a direct route or being vectored.*

(b) The SDAT calculated MIA for the area is above the MEA. In this case a second altitude must be displayed. The MEA can be used for aircraft assigned the airway but the MIA must be used for aircraft on a direct route or being vectored.

Example– *The MEA for the airway is 2,000 ft. The SDAT calculated MIA altitude for the area is 2,500 ft. In this case, 2,000 ft maybe used for aircraft assigned the airway but aircraft on a direct route or being vectored must use the MIA of 2,500 ft.*

NOTE−
See Displaying a Facility MIA Chart for MEA charting purposes.

f. Changes to the MIA base altitude.

1. Apply an Assumed Adverse Obstacle (AAO) additive to terrain except those areas around primary/satellite airports exempted by FAA Order 8260.19 and/or where applying 2,000 ft of unreduced ROC.

2. Designated mountainous terrain must be evaluated for precipitous terrain characteristics and the associated negative affects when rounding down or requesting a ROC reduction. Air Traffic Managers must use FAA Order 8260.3, paragraph 15-2-1 and the following to determine precipitous terrain:

(a) The facility must include a query to an independent data source to determine if any ground proximity warnings have been reported in the subject area. Independent data source should include but is not limited to the National Aeronautics and Space Administration (NASA) Aviation Safety Reporting System (ASRS).

(b) Consideration must be given to the facility's history and experience with turbulence at the MIA requested altitude.

(c) The facility submittal package must include a detailed account of the steps taken by the facility to determine if precipitous terrain applies.

3. Sector altitudes may be rounded down to the nearest 100 feet increment over AAO obstacles when operationally required.

NOTE−
AAO obstacle is defined as terrain with an AAO added.

4. Non-AAO obstacles may be rounded down to the nearest 100 ft increment in the contiguous United States if the altimeter setting issued to the pilot is located within 65 nautical miles of the MIA/TAV sector and in the following areas:

NOTE−
Non-AAO obstacles are defined as terrain without an AAO added or man-made structures.

NOTE−
Not authorized in Alaska, Hawaii, or any other territory or possession.

(a) Non-mountainous.

(b) Mountainous where ROC is not reduced.

(c) Mountainous where ROC was reduced but precipitous terrain is not present and/or the elevation in the area does not change by more than 1,500 ft.

(d) Mountainous where ROC was reduced and precipitous terrain is present. Rounding down can only be used when applying the procedures in Appendix A.

(e) Mountainous where ROC was reduced and the elevation in the area changes by more than 1,500 ft. Rounding down can only be used when applying the procedures in Appendix A.

5. ROC reductions for terrain and man-made obstacles.

(a) ROC reductions are only approved in mountainous areas.

(b) The facility MIA package must include a detailed account of the steps taken by the facility to determine if the sector will qualify for a ROC reduction in the sector.

(c) ROC reductions must be submitted to the appropriate Service Center Operations Support Group (OSG) for review.

(d) Previously approved ROC reductions require subsequent approval during each facility submittal.

(e) ROC reductions are available only if an operational need is identified and documented in the Remarks Section on FAA Form 7210-9.

(f) ROC reduction requests in areas with precipitous terrain characteristics must follow the steps contained in paragraph 7.f.2. If associated negative effects of precipitous terrain are

discovered during the evaluation process then ROC reductions are not authorized in the subject area.

(g) ROC reductions for terrain include a 500 ft reduction in designated Eastern Mountainous areas or a 300 ft reduction in designated Western Mountainous areas.

(h) ROC reductions for man-made obstacles include a 1,000 ft reduction. The ROC for the terrain underlying the obstacle must also be considered when applying a ROC reduction to a man-made obstacle.

g. Waivers.

1. Requests to waive criteria contained in Order JO 7210.37 must be submitted to the appropriate service area. The waiver request must contain:

(a) The criteria requested to be waived.

(b) The operational need fully explained.

(c) A Safety Risk Management (SRM) document for the change.

h. Facility's MIA submittal process.

1. Facilities must submit their MIA charts for review periodically but not to exceed 24 months.

2. Each submission must include the following items:

(a) SDAT generated facility cover letter.

(b) SDAT generated FAA Form 7210-9.

(c) Cover letter signed by facility Air Traffic Manager (ATM).

(d) FAA Form 7210-9 signed by ATM.

3. Forward the signed cover letter, signed FAA Form 7210-9, and other documentation to OSG and AJV-5 for review and certification.

4. When the project is approved, AJV-5 will send a signed FAA Form 7210-9 report.

i. After the chart is published, monitor available sources including the weekly National Flight Data Digest (NFDD) pertaining to construction notices that may affect specific MIA areas.

1. When needed, revise the affected charts.

2. Enter the revised charts into SDAT.

j. Displaying a Facility MIA Chart.

1. Applicable portions of the facility's MIA chart must be displayed at each low altitude sector.

2. Air traffic managers must determine the appropriate method for displaying this information at the sector.

3. MIAs must be displayed with each associated MIA area.

4. Displaying an additional obstruction clearance altitude in conjunction with a higher MIA based on controlled airspace.

(a) The additional obstruction clearance altitude must be identified on the chart by an asterisk (*) (e.g., 90*70).

(b) A facility directive must contain an explanation that the higher altitude on the left of the asterisk is the MIA for the area and the lower altitude to the right of the asterisk is the obstruction clearance altitude.

5. Displaying an airway adapted as a MIA area:

(a) If the MEA is sufficient for off-airway operations, the MIA and the MEA must be displayed as one altitude for that area.

(b) If a higher altitude is required for off-airway operations, then both the MEA altitude and the off-airway operations altitude must be displayed separated by a slash (e.g., 90/70).

(c) A facility directive must contain an explanation that the higher altitude on the left of the slash is the MIA for the area and the lower altitude to the right of the slash is the MEA.

7. Distribution. This Order is distributed to ATO service units: Air Traffic Services (AJT), Mission Support (AJV), System Operations Services (AJR), FAA contract ATC service providers, and all ATC facilities; select offices and services within Washington Headquarters.

8. Safety Risk Management. The changes outlined in section 5 are generally editorial and administrative in nature and serve to bring this order up to date with the current system state of the NAS and the current organizational structure of the ATO. The procedures contained within this order have not changed. In accordance with the ATO SMS Manual, no additional safety analysis is warranted. The changes contained in this order revision introduce no new operational risk.

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11/28/2018
Date Signed

Appendix A. Rounding MIA Areas with approved ROC reductions

Rounding down in MIA areas with approved ROC reductions that have precipitous terrain or elevation changes by more than 1,500 feet may be utilized if the following conditions are met:

1. The 5 year average temperature must be documented in the Remarks Section on FAA Form 7210-9,

and

2. The 5 year average temperature for the MIA area is at or above the "Minimum Average Low Temperature" for the "Approved ROC reduction" listed in the ROC Reduction/ Temperature Table.

ROC Reduction/Temperature Table

Minimum obstacle clearance in feet	Minimum average low temperature in °F
1851	-40
1651	-22
1451	-4
1251	14
1051	32
1051*	36
951	45

*951 within 35 NM of an altimeter setting source

Note– *Interpolation of this table is permitted*

3. Use the following process to determine the 5 year average of the low temperature:

(a) Go to National Climatic Data Center web site – www.ncdc.noaa.gov
(b) Click on "Data Access" on the blue bar.
(c) Click on "Quick Links".
(d) Click on "Global Historical Climatology Network" (second from the top)
(e) Click on "Global Summary of the year".
(f) Accept the default date, select "Stations" in the search for field, then enter the station representing the primary airport in the MIA area.
(g) Click on the airport name. When the next page opens, scroll down to "View Station Data".
(h) Select the year of interest and select the data. A report will appear, then go to the second page.
(i) Document the EMNT value. Select each relevant year.
(j) Calculate the total of the last five years' worth of temperature and divide by five.
(k) This amount is the value of the 5 year average temperature.

Appendix B: ERAM Terrain Alert Volume (TAV) procedures.

1. General. Local Air Traffic must resolve any TAV discrepancies noted by the Facility Automation Support Team (FAST) during facility adaptation.

2. Initial ERAM TAV build.

a. Each facility must build the TAV for the Fixed Airspace Volume (FAV) that they own to the surface.

b. If there is a question about who owns the FAVs to the surface, the airspace offices of the affected ARTCCs must determine who will build the TAV for the area in question.

c. This determination must be entered into an appropriate facility's directive for reference.

d. This will be the SDAT project that the facility must submit for the bi-annual requirement.

3. Adding TAVs outside your common boundary.

a. After the initial ERAM TAV build is approved, facilities must confer with each of the adjacent facility's airspace offices to obtain all TAVs that are located within 30 NM of their common boundary.

NOTE−
If FAST requires adaptation past 30 NM this needs to be coordinated with the adjacent ARTCC and entered in an appropriate facility's directive for reference

b. The adjacent airspace offices must coordinate that the nodes on a common ARTCC boundary match up and do not create any holes or overlaps

c. These must be added to the approved facility's SDAT project.

d. Each added TAV must include the TAV boundary and the TAV altitude.

NOTE−
This can be accomplished by obtaining the adjacent facility's approved SDAT project.

e. To add TAVs in Canadian or Oceanic airspace.

(3) Coordinate with the appropriate facility to determine the TAV boundary and altitude.
(4) Add this information to the facility's approved SDAT project.
(5) Enter the agreed upon TAV information sharing in a directive between the two facilities. This must include how the two facilities would share future TAV changes.

NOTE−
Adding TAVs from Mexico is not authorized.

f. The TAV build is now ready to be entered into the facility's adaptation.

4. Coordination between the Airspace Office and FAST.

a. It is important that a common chart date be established and coordinated between all facilities. This includes both the airspace office and FAST. If any party needs to change the common chart date then this information must be coordinated to all affected facilities.

b. Once the build has been approved and is ready for implementation, both the airspace office constructing the TAV and the airspace office receiving the coordination must enter an AIMS ticket within their facility.

c. The AIMS ticket must contain the TAV build and the wording "Coordinate with Zxx" (Zxx being the appropriate center) entered into the AIMS ticket description.

NOTE−
Upon viewing the wording "Coordinate with Zxx" in the AIMS ticket description, the facility FAST should coordinate with the adjacent center FAST to determine a common chart date. The facility FAST should coordinate the common chart date with the facility's airspace office.

5. Subsequent ERAM TAV builds.

a. When a change is made to a TAV that is located within 30 NM of the agreed upon common ARTCC boundary, the facility building the TAV must coordinate with any adjacent ARTCC airspace offices.

NOTE−
The coordination should ensure that the revised build meets their operational needs.

b. The coordination must include any revisions to the TAV boundary and TAV altitude.

c. The facility building the TAV must verify the build did not create any holes or overlaps.

NOTE−
Prior to submission an SDAT validation must be performed to ensure holes or overlaps do not exist.