



# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

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**Date:** November 4, 1998

**In reply refer to:** A-98-81 through -82

Honorable Jane F. Garvey  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20591

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On July 31, 1997, the Atlanta Air Route Traffic Control Center (ARTCC) reported an operational error resulting from its issuance of a clearance to Atlantic Southeast Airlines flight 805 to descend below the minimum instrument altitude (MIA) applicable to the area southwest of Asheville, North Carolina. The pilot received a ground proximity warning and climbed back to a safe altitude, reporting the incident to Atlanta ARTCC after landing. The National Transportation Safety Board requested information on this incident, including a copy of the Atlanta ARTCC MIA chart for the Asheville area. Inspection of this chart, used by controllers to determine safe operating altitudes for aircraft operating under instrument flight rules (IFR), revealed apparent noncompliance by the Atlanta ARTCC with various Federal Aviation Administration (FAA) handbooks and orders.

FAA Order 7210.3L, "Facility Operation and Administration," section 7-4-2, directs air traffic facilities to "determine minimum IFR altitude information for each control sector and display them at the sector. This shall include off-airway minimum IFR altitude information to assist controllers in applying FAR [Federal Aviation Regulation] Part 91.177 for off-airway vectors and direct route operations." This regulation requires that IFR operations be conducted at minimum altitudes of either 1,000 or 2,000 feet above terrain and obstacles along an aircraft's route of flight, except as necessary for takeoff or landing, or when a lower altitude is provided for a route, Federal airway, or instrument approach procedure under 14 Code of Federal Regulations (CFR) Parts 95 or 97. The 2,000-foot standard applies in areas designated as mountainous in Subpart B of 14 CFR Part 95, with 1,000-foot clearance applied elsewhere.

FAA Order 7210.37, "En Route Minimum IFR Altitude (MIA) Sector Charts," directs ARTCCs to develop MIA charts that comply with terrain and obstruction clearance requirements contained in FAA Orders 8260.3, "United States Standard for Terminal Instrument Procedures (TERPS handbook)," and 8260.19, "Flight Procedures and Airspace."

FAA Order 8260.19, chapter 3, section 7 provides instruction to the FAA flight standards personnel responsible for certifying that MIA charts submitted for review comply with required obstruction clearance criteria. Paragraph 362 of Order 8260.19, "Obstacle Clearance," states,

“ATC will apply 1000 feet of obstacle clearance in non-mountainous areas and 2000 feet in areas designated as mountainous in FAR Part 95.”

Paragraph 363 of Order 8260.19, “Obstacle Clearance Reduction,” states the following:

Where lower altitudes are required in designated mountainous areas to achieve compatibility with terminal routes or to permit vectoring to an instrument approach procedure, the FIAO [Flight Inspection Area Office] may approve reductions to the minimum altitude in accordance with the following ... ARSR [Air Route Surveillance Radar]: Reductions to not less than ... 1500 feet of terrain clearance may be authorized with appropriate obstacle clearance in accordance with en route criteria contained in TERPS, paragraph 1720b(1) and (2).

Paragraph 1720b(1) of the TERPS handbook is located in a section addressing the establishment of minimum en route altitudes (MEA) on Federal airways and provides, in part, the following:

#### 1720. OBSTACLE CLEARANCE, PRIMARY AREA.

- b. Mountainous Areas. Except as set forth in (1) and (2) below, the minimum obstacle clearance over terrain and manmade obstacles, within areas designated in FAR 95 as "mountainous" will be 2000 feet.
  - (1) Obstacle clearance may be reduced to not less than 1500 feet above terrain in the designated mountainous areas of the Eastern United States, Commonwealth of Puerto Rico, and the land areas of the State of Hawaii; and may be reduced to not less than 1700 feet above terrain in the designated mountainous areas of the Western United States and the State of Alaska. Consideration must be given to the following points before any altitudes providing less than 2000 feet of terrain clearance are authorized.
    - (a) Areas characterized by precipitous terrain.
    - (b) Weather phenomena peculiar to the area.
    - (c) Phenomena conducive to marked pressure differentials.
    - (d) Type of and distance between navigation facilities.
    - (e) Availability of weather services throughout the area.
    - (f) Availability and reliability of altimeter resetting points along airways/routes in the area.

The primary area referred to in the title of paragraph 1720 is defined in TERPS handbook paragraph 1711 as follows: “The primary en route obstacle clearance area extends from each radio facility on an airway or route to the next facility. It has a width of 8 NM; 4 NM on each side of the centerline of the airway or route.” This definition of primary area describes the basic protected airspace along the centerline of a Federal airway and makes no reference to general off-airway terrain and obstruction clearance requirements.

Comparison of the Asheville-area MIA chart excerpt provided to the Safety Board by the FAA with a sectional chart covering the same region indicates that, at the time of the incident,

Atlanta ARTCC was apparently using a 1,500-foot obstruction clearance standard to determine MIAs throughout that portion of its control area designated as mountainous terrain under 14 CFR Part 95. According to the previous references, the correct vertical separation minimum appears to be 2,000 feet, except along airways where a lower MEA has been established. At the time of the July 1997 incident, Atlanta ARTCC was applying the limited reductions in vertical separation permitted by TERPS to off-airway IFR terrain clearance in areas that clearly did not meet the standards for an exception, as specified in paragraph 363 of FAA Order 8260.19. As a result, IFR aircraft operating off airways in accordance with the minimum altitudes permitted by Atlanta ARTCC in the designated mountainous area under its control had less-than-standard terrain separation and might not have been operating in compliance with 14 CFR Part 91.177. Further, use of this MIA data as a basis for en route minimum safe altitude warning (E-MSAW) system adaptation would have also resulted in reduced warning time available from that system.

The Safety Board is concerned that the inadequate altitude margins in the Atlanta area were not detected through either the chart review process required by FAA Order 7210.37, "En route Minimum IFR Altitude Sector Charts," or as part of the national air traffic facility evaluation program. This condition suggests inadequacies in the FAA's quality assurance and review processes for both MIA chart certification and E-MSAW adaptation. Therefore, the Safety Board believes that the FAA should implement procedures that require explicit agreement between the agency's Flight Standards and Air Traffic services for the approval of charted MIAs that do not comply with the requirements of 14 CFR Part 91.177 and require a written explanation of the reasons for any permitted deviation from the standards of 14 CFR Part 91.177.

Further, the Safety Board is concerned that these inadequacies may not be limited to Atlanta ARTCC airspace. Therefore, the Safety Board believes that the FAA should review all en route MIA charts and associated National Airspace System adaptation to ensure that air traffic control (ATC) facilities comply with FAA Orders 7210.3, 7210.37, 8260.3, and 8260.19 and that pilots comply with 14 CFR Part 91.177 when operating at ATC-assigned altitudes.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Implement procedures that require explicit agreement between the agency's Flight Standards and Air Traffic services for the approval of charted minimum instrument altitudes that do not comply with the requirements of 14 Code of Federal Regulations (CFR) Part 91.177 and require a written explanation of the reasons for any permitted deviation from the standards of 14 CFR Part 91.177. (A-98-81)

Review all en route minimum instrument altitude charts and associated National Airspace System adaptation to ensure that air traffic control (ATC) facilities comply with Federal Aviation Administration Orders 7210.3, 7210.37, 8260.3, and 8260.19 and that pilots comply with 14 Code of Federal Regulations Part 91.177 when operating at ATC-assigned altitudes. (A-98-82)

Chairman HALL, Vice Chairman FRANCIS, and Members  
HAMMERSCHMIDT, GOGLIA, and BLACK concurred in these  
recommendations.

By: Jim Hall  
Chairman