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National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: November 26, 1997

In reply refer to: A-97-114 through -120

Honorable William S. Cohen
Secretary of Defense
The Pentagon
Washington, D.C. 20301

On February 5, 1997, at 1345 eastern standard time (EST), a U.S. Air National Guard (ANG) F-16 operating in a warning area (W107)¹ over the Atlantic Ocean intercepted Nations Air flight 70 (NAE70), a Boeing 727 (B-727), that was traversing the area. The proximity of the F-16 to the B-727 activated its traffic alert and collision avoidance system (TCAS), which instructed the NAE70 flightcrew to execute a descent, followed by two separate instructions to climb. AE70 was operating on an instrument flight rules (IFR) flight plan under 14 Code of Federal Regulations Part 121, as a chartered flight from San Juan, Puerto Rico, to the John F. Kennedy Airport, New York. There were no injuries to the 77 passengers and 7 crewmembers.

The Safety Board's investigation of this incident identified several areas of concern. Specifically, these areas included ineffective communication and coordination by air traffic controllers; a lack of understanding of special use airspace procedures and TCAS by military pilots; and the adequacy of air traffic control equipment at Naval facilities.

The Federal Aviation Administration (FAA), which is charged with administering the safe and efficient use of the U.S. National Airspace System, has classified warning areas as Special Use Airspace (SUA). The AIM defines the SUA as "airspace of defined dimensions identified by an area on the surface of the earth wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities." When activities are scheduled in the warning areas, air traffic controllers must reroute air traffic around them. In the past, military users regularly reserved the warning areas for extended periods of time, and although missions may have been canceled, the intended users did not immediately release the airspace. As a result, the warning areas remained in an "active" status

¹The Aeronautical Information Manual (AIM) defines a warning area as "airspace of defined dimensions extending from 3 nautical miles outward from the coast of the United States, that contains activity that may be hazardous to nonparticipating aircraft. The purpose of such warning areas is to warn nonparticipating pilots of the potential danger. A warning area may be located over domestic or international waters or both."

for the duration of the scheduled period and were not available to other transiting aircraft. In 1996, representatives from the FAA's Washington Air Route Traffic Control Center (ZDC) and U.S. Navy's Fleet Area Control and Surveillance Facility (FACSFAC), which is responsible for monitoring the military operations that are conducted within the mid-Atlantic region, including W107, developed a memorandum of understanding (MOU) that contained procedures for the use of SUA.

Civilian and military air traffic controllers are required to adhere to MOUs and FAA Order 7110.65, "Air Traffic Control." Because the controllers had reviewed the MOU just prior to their interview with Safety Board investigators, the extent of the controllers' knowledge about the MOU at the time of the incident could not be determined. However, a review of recorded voice communications between the ZDC and FACSFAC controllers clearly indicated that all of them had failed to adhere to these procedures. For example, the FACSFAC controller failed to coordinate the use of the warning area with the appropriate ZDC controller, failed to ascertain the location of pre-approved flights, and failed to advise the military flight of existing traffic.

Additionally, the Safety Board discovered that procedures contained in the MOU, as they relate to coordination for transit approval and the responsibility for the separation of aircraft, are not clearly defined. For example, the coordination procedures (between FAA and Navy controllers) for identifying aircraft and the separation standards (either 1,000 feet vertical or 5 miles lateral separation) are not specifically addressed. In addition, there are no procedures for situations in which controllers have limited time to coordinate the activation of the warning area. Therefore, the Safety Board believes that the Department of Defense and the FAA should develop a formal document that clearly defines the roles and responsibilities of each agency regarding the activation of SUA, and that provides for the timely activation of SUA to accommodate the users; prior to implementation, these agencies should also ensure that air traffic control personnel in all facilities are provided adequate training and a formal briefing on the procedures and responsibilities.

The NAE70 captain stated that while he was traversing the SUA, he had been operating in instrument meteorological conditions (IMC) during the descent from 28,000 to 10,000 feet, including the time that he responded to the TCAS alert. FACSFAC operational procedures state, "[military] pilots who cannot operate their aircraft VFR [visual flight rules] while operating in the OPAREA [operations area] must immediately advise the controlling agency.... The exception to this rule is when the area has been scheduled for exclusive use...." The Safety Board found that ANG and U.S. Air Force (USAF) representatives believed that all of their scheduled missions were for exclusive use and that the existence of IMC flight conditions within the warning area would not require the cancellation of a scheduled mission. However, the circumstances of this incident clearly indicate that the military operation was not operating as an exclusive use mission, nor was it operating in VFR conditions. The Safety Board believes that the Department of Defense, in cooperation with the FAA, should conduct a formal review of SUA procedures to ensure that they are current, safe, understood, and adhered to by all those involved. Personnel involved in this review should include USAF, Navy, FAA representatives; pilots, controllers and other persons deemed appropriate. Information generated by the review should be disseminated to every unit involved in the scheduling, control, and/or use of special use airspace.

Because separation standards differ in IFR and VFR conditions, it is imperative that air traffic controllers are aware of flight conditions in the SUA. To stay aware of those weather conditions, the Safety Board believes that the Department of Defense should require that controllers solicit pilot reports of cloud and visibility conditions from military flights that are operating in SUAs. During periods when the SUAs have been released to the FAA, the Department of Defense should require that military controllers confer with the FAA controllers so that they can maintain an awareness of flight conditions prior to the start of a scheduled mission.

After the incident, the USAF, which is responsible for the ANG, required TCAS training for all USAF/ANG pilots and implemented new intercept procedures. However, the Safety Board learned that U.S. Navy pilots have not received the same training and thus use different techniques when intercepting an air carrier aircraft. While the need to identify airborne aircraft as a matter of national security is clear, the Safety Board is concerned that safety might be compromised because some military pilots are unaware that the transponder on their aircraft may activate a TCAS that would require an air carrier flightcrew to take evasive action. The Safety Board believes that the Department of Defense should develop a formal training plan that would educate military pilots on all TCAS characteristics, and that would describe actions that would generate a TCAS alert and means to avoid an activation. Additionally, the Safety Board believes that the Department of Defense should establish clear guidelines regarding the use of transponders during intercept maneuvers to prevent unintended TCAS alerts on air carrier aircraft.

The Safety Board is aware that following the incident, the FACSFAC commanding officer made sure that controllers were thoroughly familiar with airspace activation procedures and commends the Navy for this expeditious action. During the investigation, it was revealed that the FACSFAC facility used a handwritten log to record the status of the warning area which made it difficult for controllers and supervisors to quickly review the SUA status to determine whether it was necessary to coordinate with the FAA to activate the SUA. The Safety Board believes that the Department of Defense should require that all military installations responsible for military operations within special use airspace display an illuminated status board that is visible to all controllers in the control facility that illustrates the status of the SUAs.

During a tour of the FACSFAC facility, Safety Board investigators learned that the Navy did not incorporate automated safety software into its radar display systems. The mode C intruder alert, conflict alert, and minimum safe altitude warning programs are currently available to the FAA but are not available to FACSFAC controllers. The Navy is aware that such systems are available but believes that it would be more cost effective to acquire these automated systems rather than trying to adapt these safety features into its current automated system. The Safety Board believes that to enhance safety, the Department of Defense should vigorously pursue upgrading all air traffic control equipment that directly interfaces with FAA air traffic control facilities to provide the same level of safety as that provided to civil aircraft by the FAA and ensure compatibility with automated systems in FAA facilities.

Therefore, the National Transportation Safety Board recommends that the Department of Defense:

Develop, in cooperation with the Federal Aviation Administration, a formal document that clearly defines the roles and responsibilities of each agency regarding the activation of the special use areas (warning areas), and that provides for the timely activation of special use areas to accommodate the users; prior to implementation, these agencies should also ensure that air traffic control personnel in all facilities are provided adequate training and a formal briefing on the procedures and responsibilities. (A-97-114)

Conduct, in cooperation with the Federal Aviation Administration, a formal review of special use airspace (warning area) procedures to ensure that they are current, safe, understood, and adhered to by all those involved. Personnel involved in this review should include Air Force, Navy, FAA representatives; pilots, controllers and other persons deemed appropriate. Information generated by the review should be disseminated to every unit involved in the scheduling, control, and/or use of special use airspace. (A-97-115)

Require that controllers solicit pilot reports of cloud and visibility conditions from military flights that are operating in special use areas (warning areas). During periods when the special use areas have been released to the FAA, the Department of Defense should require that military controllers confer with the FAA controllers so that they can maintain an awareness of flight conditions prior to the start of a scheduled mission. (A-97-116)

Develop a formal training plan that would educate military pilots on all traffic alert and collision avoidance system characteristics and that would describe actions which would generate a traffic alert and collision avoidance system alert and means to avoid an activation. (A-97-117)

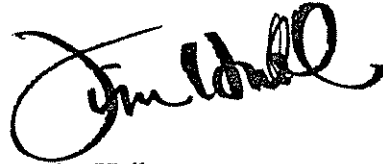
Establish clear guidelines regarding the use of transponders during intercept maneuvers to prevent unintended traffic alert and collision avoidance system alerts on air carrier aircraft. (A-97-118)

Require that all military installations responsible for military operations within special use airspace (warning areas) display an illuminated status board that is visible to all controllers in the control facility that illustrates the status of the special use areas. (A-97-119)

Vigorously pursue upgrading all air traffic control equipment that directly interfaces with FAA air traffic control facilities to provide the same level of safety as that provided to civil aircraft by the FAA and ensure compatibility with automated systems in FAA facilities. (A-97-120)

Also as a result of its investigation, the Safety Board issued Safety Recommendations A-97-112 and -113 to the FAA.

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

A handwritten signature in black ink, appearing to read "Jim Hall". The signature is stylized with a large, looping initial "J" and a cursive "Hall".

By: Jim Hall
Chairman
