

LOG 2121



# National Transportation Safety Board

Washington, D.C. 20594  
Safety Recommendation

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Date: September 30, 1992  
In reply refer to: A-92-90 through -98

Honorable Thomas C. Richards  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20591

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The National Transportation Safety Board has investigated several aircraft accidents involving considerable delays in search and rescue (SAR) efforts. The accidents cited in this letter occurred between October 21, 1988, and December 14, 1991. Although none of these accidents involved a victim whose life could have been saved by a more expeditious SAR, the Board is aware of other accidents in which the occupants of the aircraft may have survived the initial crash but were not alive when rescuers finally arrived on the scene. The Board believes that the problems identified in the cited accidents should be corrected to enhance the potential for lifesaving and expeditious location of wreckage in future SAR operations. Copies of recommendation letters involving SAR that have been sent to the Air Force and the Coast Guard regarding this issue are enclosed to ensure a more comprehensive understanding of the problem.

## BACKGROUND

The United States SAR system is implemented by the National Search and Rescue Plan (NSP). The National Search and Rescue Manual, Volumes I and II, in turn serves to implement the NSP. It was written by the Coast Guard, Navy, Army, and Air Force, and it attempts to consolidate the information that SAR personnel may need to conduct SAR missions. The Coast Guard has the coordinating responsibility for the distribution and incorporation of changes to the manual. The manual also provides for additional SAR policies or procedures that are unique to a single service or civil agency and are considered to be addenda to the manual. Neither the Department of Transportation nor the Federal Aviation Administration (FAA) have addenda to the manual. For air traffic control (ATC) personnel, SAR procedures are contained within the Air Traffic Control handbook 7110.65, Flight Services handbook 7110.10, and the Facility Operation and Administration handbook 7210.3.

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The Air Force has inland SAR responsibility, and the Coast Guard has maritime SAR responsibility. Rescue coordination centers (RCCs) serve as central facilities for the coordination of SAR missions, as the name suggests. For example, the RCC having responsibility for the land mass part of the lower 48 states is Scott RCC at Scott Air Force Base, Illinois. Maritime SAR is under the command of either the Commander, Atlantic Area, US Coast Guard, or the Commander, Pacific Area, US Coast Guard. Several Coast Guard RCCs are located on each coast. For example, the Atlantic Area contains the New Orleans RCC, Miami RCC, San Juan RCC, Norfolk RCC, New York RCC, and the Boston RCC.

Organizations and agencies that perform SAR missions are international, Federal, State, county, municipal, commercial, or private in nature. For example, the Search and Rescue Satellite-Aided Tracking (SARSAT) system is an interagency, internationally sponsored system of low-altitude, near-polar orbiting satellites and ground receiving stations. This network is designed to provide the approximate positions of distress beacon signals from aviation emergency locator transmitters (ELTs) and their maritime equivalents, which are the emergency position indicating radio beacons (EPIRBs). SARSAT uses two US and two Soviet satellites. The United States SARSAT Mission Control Center, located at Suitland, Maryland, provides position information from distress beacon signals to appropriate RCCs, and also exchanges similar data with other countries.

SAR arrangements within various states are quite different from one another. Some states have a designated SAR Coordinator, other states may have a Department of Emergency Services, while still others may have neither. The RCC serves as a coordinator as well as an advisor, passing information and suggestions to states that have an SAR Coordinator, Department of Emergency Service, or other state-level function of a similar nature. For example, the RCC obtains radar track information from air route traffic control centers (ARTCCs) and terminal approach control facilities, and forwards this information, with recommendations as to where to search, to the various organizations involved in an SAR operation.

One of the primary resources of the Air Force RCC is the Civil Air Patrol (CAP). It uses corporate and privately owned aircraft, and flies the majority of SAR missions in the Inland Region. The CAP is composed of aviation-oriented civilians, military reservists, and active-duty military volunteers and is organized along conventional military lines, via state wings. CAP facilities operate in every state and Puerto Rico. The Air Force RCC initiates the involvement of the CAP for a specific SAR mission. The Air Force RCC coordinates directly with the CAP if the state is not involved in the investigation. If the state is involved in the investigation, the CAP is then under the direction of the state.

Although this background information is obviously basic, the Board believes that had this type of basic information been common knowledge among ATC personnel, many of the misunderstandings and resultant delays described in this letter would not have occurred.

## DISCUSSION OF ACCIDENTS

### DECEMBER 14, 1991

At 1742 eastern standard time, N4959P, a PA23-235, crashed about 1 and 1/2 miles northeast of the Fall River, Massachusetts, Airport. N4959P had been executing a nondirectional beacon approach. The pilot reported the airport in sight and cancelled the instrument flight rules (IFR) flight plan. A minute later he reported, "lost the airport" to the controller. The controller issued a clearance for the aircraft to climb and maintain 2 thousand feet but got no reply from the pilot. Control personnel then tried to call the Fall River Airport but had an incorrect telephone number and let the matter drop. The pilot's wife began looking for the aircraft and at about 2330 eastern standard time, called the approach control facility having the last communication with the aircraft. Supervisory personnel then made the correct notifications, but the aircraft was not located until 0650 eastern standard time the following morning. As is apparent from the following accounts of other accidents, many controllers and supervisors do not know what course of action is to be followed in the case of a "suspected" accident. The Board believes that the primary reason for this is that the Air Traffic Control handbook 7110.65 does not address this subject.

### JUNE 20, 1990

On June 20, 1990, a Piper PA31T, YV-2200P, was en route from Fort Lauderdale, Florida, to Caracas, Venezuela, under the control of the Miami ARTCC. The pilot, while in cruise flight at 25,000 feet over Andros Island, Bahamas, requested to return to Fort Lauderdale. The airplane subsequently reversed course before disappearing from the radar display. Miami ARTCC personnel reported the airplane's last radar position erroneously, which resulted in SAR personnel looking 30 miles from the actual crash site.

After the airplane had descended below radar coverage, the ATC automated radar projected a "coast track" in the direction of the planned route of flight rather than in the direction of the course reversal. The position information from the last projected "coast track" position was forwarded to SAR personnel instead of the airplane's actual last radar hit. The error was corrected when a quality assurance specialist, arriving at work at the beginning of the morning shift, determined the correct position of the last radar hit. The correct interpretation of the radar data showed that the last recorded radar return was over the island at the point where the actual wreckage was located. The correct information was then transmitted to the Coast Guard and the wreckage was located.

If the ARTCC had personnel on duty, at that particular time, who were qualified to correctly interpret computerized radar track information, the last radar position of the airplane could have been accurately determined within 5 minutes after contact was lost. The Safety Board believes this accident illustrates a need for the FAA to ensure that ATC facilities that have radar recording capabilities have access to individuals at all times who

are capable of developing and correctly interpreting computerized radar track information for SAR purposes.

NOVEMBER 1, 1989

On November 1, 1989, N50TR, a Piper PA-601P, on an air-taxi flight, crashed while on approach to Southwest Florida Regional Airport, Fort Myers, Florida, around 0205 local time. Because the ATC tower was closed for the night, the pilot received an instrument approach clearance from the Miami ARTCC. When the controller did not receive notification that the aircraft had landed, he immediately reported the matter to his supervisor. The aircraft's ELT was apparently activated by the crash impact, and its signal was received by SARSAT. However, ARTCC personnel were unaware of this fact until they were notified by the AFRCC. Four hours and 30 minutes after the airplane disappeared, an in-bound flight to the airport reported a downed aircraft to the ATC tower. The wreckage was located on the final approach course, 1.5 nautical miles (nmi) from runway 6. More than 5 hours after the accident, a ground party reached the wreckage, which included a fatally injured passenger and a critically injured pilot.

The following summarizes problems associated with the SAR aspects of this accident:

1. Although the ARTCC which cleared the aircraft for the approach had temporary jurisdiction of the airspace surrounding the airport, it did not have a telephone number for the airport operations office in order to conduct a ramp check to determine if the aircraft had landed.

2. Neither the ARTCC nor the Automated International Flight Service Station (AIFSS) had a telephone number for the county sheriff's department, or for any Fort Myers area law enforcement agency, so that they could be notified of a suspected accident.

3. The Air Force Rescue Coordination Center (AFRCC) requires an Alert Notice (ALNOT) to open an SAR mission. By the time that the AFRCC received notification from SARSAT<sup>1</sup> about an ELT in the vicinity of Fort Myers, the Miami ARTCC should have already generated an ALNOT, based on the loss of radio and radar contact. The AFRCC would then have been able to open the SAR mission more than 2 hours before it actually did so.

4. When the AFRCC had called the Florida Department of Emergency Management (DEM) with information from SARSAT of an ELT in the vicinity of Fort Myers, Florida, it appeared as though the DEM should have taken action. However, within existing guidelines, an ALNOT is required before the state takes action. Had the ARTCC area manager transmitted an ALNOT as required, not only the response of the AFRCC, but the response of the Florida DEM, could have been more timely. Local and regional resources could then have

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<sup>1</sup> Notification from SARSAT was delayed about 50 minutes. The cause of the delay has been corrected, and should not continue to be a problem.

been notified by the state, resulting in an earlier start of the SAR operation.

5. The ARTCC area manager utilized an incorrect checklist and issued a message in the DETRESFA category (a type of International Civil Aviation Organization (ICAO) message). This message was inappropriate and useless. The AFRCC personnel finally deviated from procedures and opened the SAR mission without the usual ALNOT.

6. ARTCC, AIFSS, and DEM personnel made statements, such as "the aircraft was not confirmed down" and "we don't know whether to call it an overdue aircraft or an accident." None of these organizations knew that they could act based on the suspicion of an aircraft being down.

7. Contrary to established procedures, the DETRESFA message and ALNOT were then not cancelled in a timely manner after the aircraft was found.

The Safety Board believes that these problems are the result of a basic lack of understanding of the SAR system by many controllers and supervisors. The ICAO format DETRESFA message sent by the ARTCC area manager would have been appropriate if the airplane was believed to be in international waters. The notification only to the Coast Guard Miami RCC would have been appropriate if the airplane was believed down off of the coast. However, Southwest Florida Regional Airport is about 10 miles from the coast. And with the aircraft established on an instrument landing system (ILS) approach over land, radar service properly terminated and acknowledged, the most logical place to expect a crash site would have been on the final approach course. Therefore, notification to the AFRCC would have been most appropriate. The Safety Board believes that if the area manager and other personnel had acquired more basic knowledge of SAR procedures, specifically, the jurisdictions of the various RCCs, and the specific SAR-related responsibilities of flight service stations (FSSs), towers/approach control facilities, and ARTCCs, the correct actions would have been taken.

The Air Traffic Control handbook 7110.65, Chapter 9, "Emergencies," contains the paragraphs pertinent to SAR. However, the Safety Board believes that these paragraphs are confusing and do not contain enough information. For example, a significant problem noted in the investigation of this accident was the lack of a timely ALNOT. Chapter 9 does not mention that an ALNOT is required before the AFRCC can open an SAR mission. The Safety Board therefore believes that the FAA should revise Chapter 9 to include information about the ALNOT requirement.

In this accident, as well as other mishaps that initially appeared as either a suspected accident or downed aircraft, some ATC personnel had difficulty handling the situation because there was no confirmation of a mishap other than the loss of radio and radar contact. The Safety Board further believes that Chapter 9 should be clarified so that it is readily apparent that the procedures contained within that Chapter also apply to a suspected accident.

Chapter 9, section 1, paragraph 9-3, note 3, states that ARTCCs serve as

the central points for collecting information, for coordinating with SAR, and for conducting a communications search by distributing any necessary ALNOTs concerning overdue or missing aircraft operating under IFR. Section 3, paragraph 9-30, states that an aircraft should be considered to be "overdue" when neither communications nor radar contact can be established with an aircraft and 30 minutes have passed since its estimated time of arrival over a reporting point, at a clearance limit, or clearance void time. A "missing" aircraft is not defined. The Safety Board believes that it should be.

ATC facilities maintain a form titled "Facility Accident Notification Record," which is a list of the telephone numbers of organizations to be contacted in the event of an accident. Accident investigations have shown that although most of these checklists are adequate for known accidents, they are inadequate for suspected accidents. The Safety Board therefore believes that the FAA should provide checklists, capable of being adapted for local considerations, for all of its ATC facilities for a suspected accident in which the site is unknown and SAR personnel must be notified.

#### AUGUST 13, 1989

On August 13, 1989, N1976Q, a Cessna 177RG, crashed near Janice, Mississippi. The airplane was operating under visual flight rules (VFR) and had been in radio and radar contact with Gulfport Approach Control. During the first 9 minutes after radio and radar contact were lost, approach control called Houston ARTCC, Mobile Approach, and Mobile FSS, advising that radio and radar contact with the airplane had been lost. These facilities were also given the airplane's last radar-observed position. The local sheriff's department also searched for the airplane but was unable to locate it.

None of the FAA facilities notified the RCC at Scott AFB. Six hours after the accident, a member of the Mississippi National Guard informally contacted the RCC at Scott AFB and learned that the RCC was unaware of the search. The airplane was not found until 8 hours after the accident. Although in this case the notification to Scott AFRCC did not aid in finding the airplane, the inaction of ATC personnel indicates inadequate controller knowledge of proper responses for suspected accident conditions. The Safety Board believes that the FAA should revise Air Traffic Control handbook 7110.65 to explain the organization of the SAR system, the jurisdictions of the RCCs and the specific responsibilities of FSSs, tower/approach control facilities, and ARTCCs.

#### MARCH 25, 1989

On March 25, 1989, at 2220 local time, N20NQ, a Tobago TB-10, crashed near Pittsfield, Massachusetts. The flight was being conducted under VFR, inbound to the Albany, New York, airport and was in radio and radar contact with Albany Approach Control. FAA personnel never contacted the RCC at Scott AFB. The wreckage was not found until 13 hours after the accident.

Our investigations have revealed that most terminal controllers and supervisors will expect the AFRCC to be notified by the ARTCC after notifying the ARTCC themselves. After the supervisor at Albany Approach

Control believed that the aircraft had crashed, he notified the Boston ARTCC, thinking that the Boston ARTCC would notify the RCC. The acting area manager of Boston ARTCC provided various types of assistance but did not notify the RCC. Neither the checklist that he used nor the Air Traffic Control handbook 7110.65 stated that he should call the RCC. He determined that because the aircraft was operating under VFR, the ARTCC was not responsible for notifying the RCC.

Documents contained at Boston ARTCC, "Incident Reports, Preparation, and Reporting Requirements," and "Emergency Checklist," did not give any guidance as to who should have notified the RCC for SAR purposes. Air Traffic Control handbook 7110.65, Chapter 9, titled "Emergencies," paragraph 9-3, advises controllers to ensure that SAR procedures will be initiated if an aircraft becomes overdue or unreported. It states that such action can be accomplished through the ATC system for IFR aircraft and the flight plan system for VFR aircraft. (N20NQ was VFR. Flight plan system means flight service station). It also states that FSSs serve as the central points for collecting and disseminating information on an overdue or missing aircraft that is not on an IFR flight plan. However, a following note states that the ARTCC serves as the central point for collecting information and coordinating with RCC on ELT signals, but does not indicate if this applies to IFR or VFR aircraft or both.

Although ambiguous, the Air Traffic Control handbook states that if an overdue or missing aircraft is operating under VFR, the FSS should be notified. If N20NQ had been operating under IFR, it should have been reported by the ARTCC to the RCC. However, being VFR, the flight should have been reported to the FSS, which then would have notified the RCC. The procedures for the reporting of information regarding VFR aircraft are obviously outdated procedures, drafted when most VFR flying was done with the pilot not being in radio or radar contact with an ATC facility. N20NQ was VFR in radar contact, squawking mode C, inbound to a major airport, and in radio communication with a radar controller. The procedures should be changed to reflect today's environment. Today, many aircraft operating under VFR are in both radar and radio contact with ATC facilities. The Safety Board believes that the FAA should revise Air Traffic Control handbook 7110.65 so that SAR procedures are initiated through the ATC system rather than the flight plan system for any aircraft operating under VFR that is overdue, unreported, or involved in a suspected accident, if that aircraft was in radio and radar contact with an ATC facility when that facility lost radio and radar contact.

#### OCTOBER 21, 1988

On October 21, 1988, at 1815 eastern daylight time, an Aerofab, Inc. seaplane, Lake LA-250, N250MW, crashed after losing control during climbout from a touch-and-go landing in the Gulf of Mexico near Key West, Florida. The occupants exited and climbed onto the underside of the fuselage, which was partially out of the water, to await rescue.

The FAA Control Tower at Key West International Airport later received a telephone call from the wife of the pilot advising that the airplane was overdue. The controller did not forward this information to the FSS, nor was he required to according to Air Traffic Control handbook 7110.65. An hour and 30 minutes after the accident, the pilot's wife again called the tower about the overdue airplane. The controller then checked with the Naval Air Station Tower, Miami FSS, and Miami ARTCC, all of which reported no contact with the airplane. He then advised her to call the Coast Guard. Two hours and 30 minutes after the accident, the pilot's wife reported the overdue airplane to the Coast Guard station at Key West. The station then forwarded this information to the Coast Guard Operations Center.

Four hours and 45 minutes after the accident, a passenger of the downed aircraft fired two flares after he spotted a Coast Guard aircraft. Rescue operations took place 6 hours after the accident had occurred.

The procedures in Air Traffic Control handbook 7110.65 do not address how to handle a telephone call from a concerned family member to an ATC facility. If these procedures had existed, all that would have been necessary for the controller to do would have been to refer the call to an FSS. Had this occurred, one could then expect the procedures in the handbook for FSS personnel, Flight Service 7110.10, to have been carried out. In that handbook, Paragraph 8-3, for overdue aircraft, instructs flight service personnel to consider an aircraft not on a flight plan as overdue at the actual time a reliable source reports it to be at least 1 hour late at the destination. Based on this overdue time, personnel are expected to apply the same procedures and actions as they do for aircraft on a flight plan. When such a report is received, personnel are also instructed to verify, if possible, that the aircraft actually departed and that the request is for a missing aircraft rather than a missing person. (The paragraph also states that missing person reports should be referred to the appropriate authorities.)

The Safety Board believes that the procedures in the handbook for flight service personnel are adequate but that the procedures in the Air Traffic Control handbook 7110.65, which should have instructed the air traffic controller to refer such calls to an FSS, are inadequate. The closest application in 7110.65 may be found in Chapter 9 "Emergencies." Paragraph 9-3 instructs the controller to "provide maximum assistance to aircraft in distress." Note 1 of the same paragraph states that the FAA should ensure that SAR procedures will be initiated if an aircraft becomes overdue or unreported. It does not specifically advise air traffic controllers to refer telephone calls from concerned family members to FSS if the aircraft in question is a VFR aircraft. The Safety Board believes that such specific language is necessary for this section of the handbook. Therefore, the Safety Board believes that the FAA should add a section to Chapter 9, Air Traffic Control handbook 7110.65, instructing controllers that if a concerned family member calls an ATC facility regarding an overdue, unreported, or possibly downed VFR aircraft, such a call should be referred to the appropriate FSS.



## DISCUSSION AND RECOMMENDATIONS

As a result of these investigations, the Safety Board believes that Air Traffic Control handbook 7110.65, Chapter 9, should more clearly define the situations to which it applies and the actions to be taken in those situations, and that FAA ATC personnel, especially supervisory personnel, should have a more thorough knowledge of SAR procedures. During the investigation of one of the aforementioned accidents, the manager of a Level III terminal facility was interviewed. He told Safety Board investigators that he did not know the function of an RCC. He said that he knew that he was supposed to notify the ARTCC and that the ARTCC would in turn notify the RCC of a suspected downed aircraft.

The Safety Board has discovered at least one emergency checklist at a tower that had the initials "RCC"<sup>2</sup> on the list of places to be contacted. The controller on duty notified the FAA Regional Communications Center, rather than the Scott AFRCC. The Safety Board believes that the control personnel involved in these accidents are apparently unfamiliar with the organization of the SAR system as well as the responsibilities of the various parties. Consequently, if controllers had improved basic knowledge of the SAR system, there would be fewer errors. If a controller knows why he is providing notification to a facility on a checklist, and what that next facility will do with the information he is providing them, fewer mistakes would be made.

As a result of the investigation of these accidents, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Revise Air Traffic Control handbook 7110.65 to include a section that explains the organization of the Search and Rescue (SAR) system, the jurisdictions of the various Rescue Coordination Centers, and the specific SAR-related responsibilities of flight service stations, towers/approach control facilities, and air route traffic control centers. (Class II, Priority Action) (A-92-90)

Establish procedures to ensure that each facility having radar recording capability has access to personnel at all times who are capable of developing and correctly interpreting computerized radar track information for search and rescue purposes. (Class II, Priority Action) (A-92-91)

Revise Air Traffic Control handbook 7110.65, Chapter 9, to emphasize to all air traffic control personnel that the Air Force Rescue Coordination Center requires an Alert Notice to open a search and rescue mission on an aircraft operating under instrument flight rules. (Class II, Priority Action) (A-92-92)

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<sup>2</sup> RCC means both rescue coordination center and regional communication center.

Revise Air Traffic Control handbook 7110.65, Chapter 9, so that it is readily apparent that the procedures in that chapter also apply to a suspected accident, for instances in which the exact location is unknown. (Class II, Priority Action) (A-92-93)

Clarify the procedures in Air Traffic Control handbook 7110.65 Section 1, paragraph 9-3, note 3, which state that Air Route Traffic Control Centers serve as the central points for conducting a communications search by distributing Alert Notices (ALNOTs) concerning overdue or missing aircraft. The procedures should specifically state that Centers shall issue an ALNOT for overdue or missing instrument flight rules aircraft and should provide a definition of "overdue" and "missing." (Class II, Priority Action) (A-92-94)

Direct all air traffic control facilities to develop checklists for their use in responding to a suspected accident in which the accident site is unknown and search and rescue personnel are to be notified. These checklists should be unique to each facility regarding local considerations. The use of organizational acronyms or initials with dual meanings should be avoided. (Class II, Priority Action) (A-92-95)

Direct air traffic control facilities, especially air route traffic control centers, which have temporary or part-time control jurisdiction of tower airspace, to develop lists of emergency contacts, such as airport operations offices and county or local area law enforcement agencies, for use during that temporary or part-time jurisdiction. (Class II, Priority Action) (A-92-96)

Revise Air Traffic Control handbook 7110.65, Chapter 9, "Emergencies," to direct controllers to refer all telephone calls or inquiries concerning overdue, missing, or unreported aircraft operating under visual flight rules to flight service stations. (Class II, Priority Action) (A-92-97)

Revise the Air Traffic Control handbook 7110.65 to require that search and rescue procedures be initiated through the Air Traffic Control system, rather than the flight plan system, for any aircraft operating under visual flight rules that is overdue, unreported, or involved in a suspected accident, and had been in radio and radar contact with an air traffic control facility prior to that facility losing radio and radar contact. (Class II, Priority Action) (A-92-98)

Chairman VOGT, Vice Chairman COUGHLIN, and Members LAUBER, HART, and HAMMERSCHMIDT concurred in these recommendations.

A handwritten signature in cursive script, appearing to read 'C. W. Vogt', written in black ink.

By: Carl W. Vogt  
Chairman