National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: January 29, 2010

In reply refer to: A-10-1 through -9

The Honorable J. Randolph Babbitt
Administrator
Federal Aviation Administration
Washington, DC 20591

This letter describes the need for improvements in Federal Aviation Administration (FAA) support of search and rescue (SAR) response to aircraft accidents. The Air Force Rescue Coordination Center (AFRCC) has responsibility for initiation and coordination of SAR activities in the domestic United States. In several recent accidents, information readily available to FAA staff was either not well communicated or not made available to the AFRCC in a timely manner. The information could have significantly expedited the location of downed aircraft and recovery of survivors. The National Transportation Safety Board (NTSB) believes that improvements in information access and delivery could reduce search time and speed the rescue of survivors.

When the AFRCC receives information that a new accident or incident requiring SAR response has occurred, AFRCC personnel assign it an incident number and begin to obtain all available information about the flight. Each significant event or contact during the search is recorded in a chronological mission log. The AFRCC coordinates the activities of the searchers and serves as a clearinghouse for information. It continues to track the mission until the aircraft is located or the search is suspended pending additional information.

Communication Between FAA Air Traffic Control and AFRCC

The following accident illustrates some of the problems with communication between FAA air traffic controllers and AFRCC staff. On April 26, 2007, about 1430 eastern daylight time, a Piper PA-38-112, N9247T, crashed into trees and rising mountainous terrain at Amicalola Falls State Park in Dawsonville, Georgia, while attempting to stay below overcast cloud conditions. The certificated commercial pilot, the sole occupant, eventually died as a result of the accident, and the airplane sustained substantial damage. The flight was operated as a personal flight under the provisions of 14 *Code of Federal Regulations* (CFR) Part 91, and no flight plan was filed. Instrument meteorological conditions prevailed near the accident site. The flight originated from Habersham County Airport, Cornelia, Georgia, about 1400, destined for Lunken

Field, Cincinnati, Ohio.[1] Evidence indicates that the pilot likely survived the accident and activated an emergency transponder code but died before the airplane was located.

Shortly after the crash, controllers at the Atlanta Air Route Traffic Control Center (ZTL) noticed an unidentified stationary radar target about 50 nautical miles (nm) north of Atlanta.[2] Beginning about 1534, the target transmitted transponder code 7700, which is a dedicated emergency code reserved for use by aircraft in distress, and its use by the accident pilot caused a special flashing "EMRG" alert to appear on ZTL radar displays.[3]

About 1552, the ZTL traffic management coordinator (TMC) notified the AFRCC of emergency locator transmitter (ELT) reports[4] and observation of the 7700 code.[5] During the call, the TMC stated that there were "numerous ELT reports…north of Atlanta" and that he did not believe that an incident number had been assigned. The AFRCC controller replied that an incident had been reported south of Atlanta. The TMC noted that the reports he was calling about were north of Atlanta and that "…we actually show an emergency beacon flashing north of the airport." (In using the term "emergency beacon," the TMC was attempting to communicate the observation of a 7700 emergency transponder signal, which provides more specific location information than ELT reports and indicates more definitively that an emergency has actually occurred.) At the AFRCC controller's request, the TMC provided the information in the ELT reports, and the call concluded.

The AFRCC controller did not provide an incident number to the TMC, which would have indicated that she understood that the TMC's report indicated a new incident. Rather, she associated the report with the incident south of Atlanta. Once the report for the incident south of Atlanta was closed, that also ended any activity related to the ELT reports and radar observations north of Atlanta provided by ZTL's TMC.

Thus, no SAR effort was begun for N9247T until family members reported the accident airplane missing the following day. As there was evidence that the pilot survived the crash, this was a critical SAR failure. Based on the family's report of the missing airplane, the Dayton, Ohio, Flight Service Station (FSS) issued an Alert Notice (ALNOT)[6] about 1247. According to the AFRCC's mission log, the AFRCC began attempting to locate the airplane immediately upon

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[1] Additional information about this accident, NTSB case number ATL07FA081, can be found on the NTSB's website at <http://www.ntsb.gov/ntsb/query.asp>.

[2] According to a review of recorded radar data, between 1409 and 1422, an aircraft on transponder code 1200 was tracking westbound toward the crash site. During that period, the aircraft descended from 3,000 feet to 2,500 feet above mean sea level. The aircraft's target disappeared until 1424, when it reappeared on a northeasterly track at 3,000 feet. The aircraft continued northeast, climbing to 3,200 feet, until 1429. The aircraft's target then stopped moving. The transponder continued to function on code 1200 until 1455.

[3] Between the time of the accident and 0058 the next day, when the target disappeared, the transponder code changed from 1200, to 1100, to 7701, to 7700, to 7701, and back to 7700, indicating that the transponder controls were being manipulated by the pilot.

[4] Controllers requested that other aircraft in the area monitor emergency frequency 121.5 to check for ELT signals. Several pilots did report that ELT signals were detected.

[5] Per FAA Order 7110.65, "Air Traffic Control," ATC facilities are required to report ELT signals and 7700 emergency transponder codes to the AFRCC.

[6] An ALNOT indicates that an aircraft is missing and possibly needs SAR action.

receipt of the ALNOT. Air searchers located the airplane about 49 hours after the accident, and the ground team arrived shortly afterward. The team reported that the pilot was deceased.

During the search, the AFRCC activated Civil Air Patrol (CAP) wings in four states, coordinated information gathering activities with numerous FAA air traffic control (ATC) and Lockheed flight service facilities, and obtained radar analysis assistance from CAP and U.S. Air Force (USAF) air defense personnel. The extensive effort was necessary mainly because the AFRCC controller did not understand the FAA's communication about the existence and location of the 7700 emergency signal being transmitted by N9247T.

In postaccident discussions, AFRCC management said that the AFRCC controller who took the call from the TMC believed that the reports being provided were related to the existing incident reported south of Atlanta, so she did not open a new incident in response to the TMC's call.[7]

The lack of standard phraseology for communications between FAA and AFRCC personnel about particular observations, such as the observation of an emergency 7700 transponder code, clearly hindered the SAR effort in this event. For example, the AFRCC controller also did not understand that the TMC's report of "an emergency beacon flashing north of the airport" indicated that ZTL was observing a 7700 emergency code on radar. If the AFRCC controller had understood that ZTL was forwarding not only ELT reports but also a radar observation of an emergency 7700 code north of Atlanta, she likely would have recognized that two separate events were occurring and assigned a new incident number to the emergency 7700 code instead of associating the new information with the previous ELT reports south of Atlanta.

Other types of ATC communications, such as those with pilots, use standard phraseology to reduce the possibility of misunderstanding. Because the use of standard phraseology concerning observation of ELT signals and emergency beacon codes will reduce the likelihood of misunderstanding between the FAA and AFRCC when initiating a SAR effort, the NTSB recommends that the FAA develop, in conjunction with the AFRCC, specific phraseology for communicating about the location, time, and nature of ELT signals and emergency beacon codes. The NTSB further recommends that the FAA amend FAA Order 7110.65, "Air Traffic Control," to prescribe the use of the phraseology requested in Safety Recommendation A-10-1.

The NTSB further recommends that the FAA provide training for all FAA personnel who may be required to interact with the AFRCC, ensuring that personnel understand the AFRCC's incident reporting process and recognize that new incidents are always assigned a unique incident number.

Although internal discussions about the 7700 code continued among ATC personnel at ZTL, facility personnel believed that they had properly reported their observations to the AFRCC and that the AFRCC was handling the incident. There were no further contacts between the two organizations regarding the situation. ZTL controllers performed a records check the next day when they received the ALNOT regarding N9247T, but they responded to the FSS that ZTL had

[7] To have ELT reports for one incident occur over a wide area, for example, both north and south of Atlanta, is not uncommon because ELT transmissions are radio broadcasts that can be received by aircraft located many miles from the source.

no information on the aircraft because the accident pilot had never contacted ZTL for services. No one at ZTL associated the previous night's observed 7700 code in the facility's log with the aircraft referred to in the ALNOT.

Although there was no evidence that any postreport SAR activities were occurring near the observed 7700 code, ZTL did not, and was not required to, follow up with the AFRCC during the 5 1/2 hours that the emergency code continued to be visible to controllers. ZTL controllers were also not required to record their contacts with the AFRCC so that other controllers could follow up and provide additional information if needed.

Therefore, to ensure that incidents reported to the AFRCC are tracked to closure, the NTSB recommends that the FAA require ATC facilities to enter all AFRCC contacts on FAA Form 7230-4, "Daily Record of Facility Operations," and, in circumstances where that contact results in the AFRCC assigning a new incident number to the event, require facilities to contact the AFRCC at least once per shift for a status update until the AFRCC advises that an incident has been resolved.

Radar Data Analysis and Dissemination

The first priority following a suspected accident must be to immediately locate the aircraft and rescue any survivors. The NTSB recognizes that physical SAR is not an FAA responsibility, but the FAA is frequently the first organization to become aware that an aircraft is missing, and FAA facilities normally possess recorded data that could rapidly assist first responders in locating the accident site. Correctly using these data often requires experience in interpreting radar reports and expertise in radar processing tools. The following accidents show how a lack of appropriately interpreted FAA radar data delayed SAR response and the location of wreckage.

Philipsburg, Pennsylvania

On June 26, 2006, about 0302 eastern daylight time, a Piper PA-28R-200, N56246, was destroyed when it impacted trees and terrain during an instrument approach to Mid-State Airport (PSB), Philipsburg, Pennsylvania. The certificated commercial pilot was fatally injured, and three passengers were seriously injured. The flight originated at Springfield Robertson County Airport, Springfield, Tennessee, on June 25, 2006, about 2243 eastern daylight time. Instrument meteorological conditions prevailed, and an instrument flight rules (IFR) flight plan was filed for the personal flight conducted under 14 CFR Part 91.[8] Searchers located the aircraft 8 hours after the accident.

At the time of the accident, the airplane was receiving ATC services from New York Air Route Traffic Control Center (ZNY). According to FAA communications transcripts, about 0241, the pilot requested the instrument landing system (ILS) approach to runway 16 at PSB and was cleared to proceed direct to the outer marker, located about 6 nm northwest of the airport. About 0246, the controller cleared the pilot to cross the outer marker at or above 4,000 feet and execute the ILS approach to runway 16. About 0248, the pilot confirmed with the controller that the

[8] Additional information about this accident, NTSB number NYC06FA156, can be found on the NTSB's website at <http://www.ntsb.gov/ntsb/query.asp>.

clearance was for the “full approach” and that the controller would not be providing radar vectors to the final approach course. About 0249, the controller advised the pilot that he was approximately 1 mile south of the outer marker. The controller instructed the pilot to change to advisory frequency and to report cancellation of his IFR flight plan on ZNY frequency or by contacting flight service. The pilot acknowledged the instructions. There were no further contacts with the aircraft. The controller called the accident aircraft five times between 0318 and 0348, but there was no response.

The ZNY controller noted that the airplane was missing. ZNY transmitted an ALNOT to the AFRCC and other ATC facilities stating that the aircraft's last known position was 2 nm south of the outer marker at PSB at 3,200 feet. The AFRCC received the ALNOT and opened an incident about 0424, noting that the Pennsylvania State Police had checked PSB airport and was unable to locate the airplane.[9] About 0641, over 3 1/2 hours after the airplane crashed, ZNY advised the AFRCC that radar data would be provided “as soon as possible.” The AFRCC mission log contained no record of any radar data having been provided by ZNY. About 0823, the AFRCC solicited assistance from the USAF Northeast Air Defense Sector (NEADS), which records radar data for the eastern half of the United States. About 0932, after reviewing its recorded radar data, NEADS provided a last known latitude and longitude position for the accident aircraft, which AFRCC forwarded to the search teams.

About 1138, the CAP ground search team advised the AFRCC that they had located the airplane, with one deceased occupant and three survivors suffering from shock and multiple injuries. The AFRCC mission log noted that the airplane was found as a direct result of the radar analysis performed by NEADS.

An NTSB review of recorded radar data showed that the last position recorded by ZNY for the airplane was 5.6 nm south of the outer marker, not 2 nm south as reported in the ALNOT. The last few radar targets tracked directly toward the crash site. (See figure 1.) The airplane was eventually located about 0.6 nm south of the last radar target and about 300 yards from the closest road. If the FAA radar data had been immediately evaluated and made available to the AFRCC, as well as the Pennsylvania State Police or other local first responders, the delay in determining the aircraft's last known radar position would have been almost completely eliminated, and searchers could have located the airplane and rescued the survivors much sooner than 8 hours after the accident.

[9] It is standard practice for ATC facilities to solicit assistance from local authorities in checking the destination airport and airports in the immediate area to see if the missing aircraft has landed safely and the pilot has simply failed to close the flight plan.

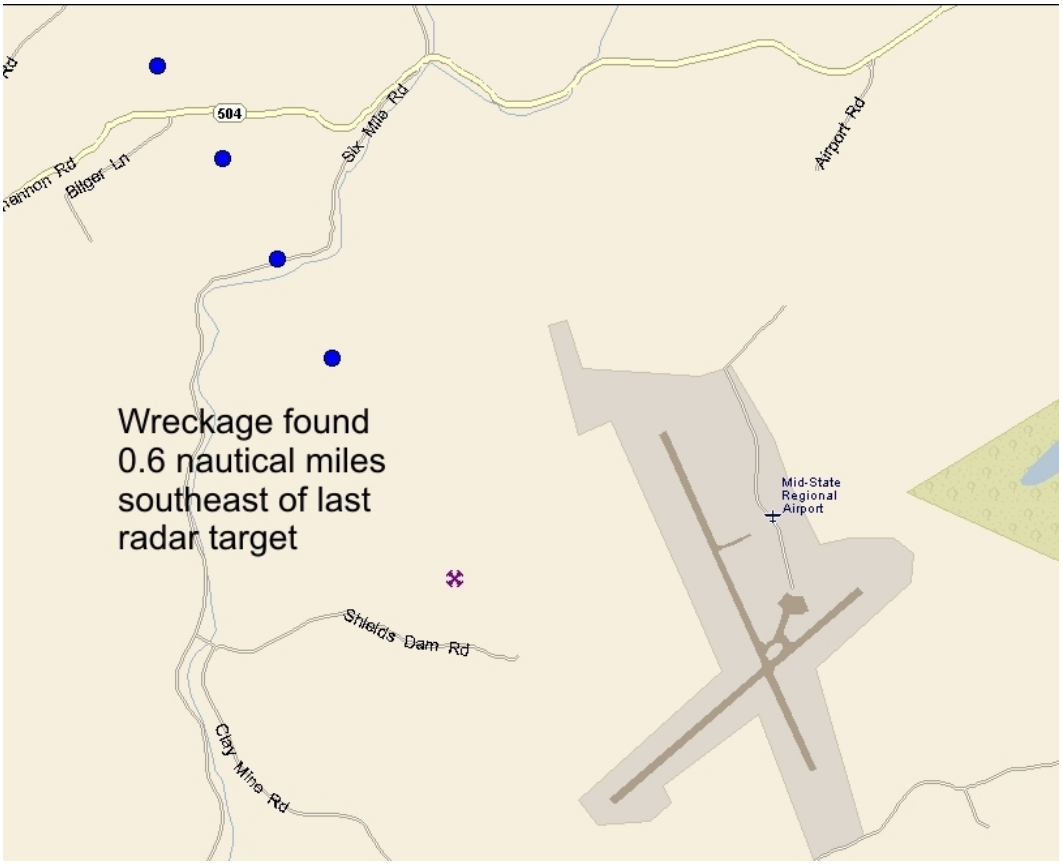

Figure 1. Map of the Philipsburg, Pennsylvania, accident area overlaid with radar targets leading to N56246's wreckage about 0.6 nm southeast of last FAA radar target.

Moulton, Alabama

On May 13, 2007, about 1730 central daylight time, a Hughes 369A helicopter, N468WE, impacted terrain in Bankhead National Forest near Moulton, Alabama. The helicopter was destroyed, and the commercial pilot was killed. Visual meteorological conditions prevailed at the time of the accident and no flight plan was filed for this personal flight conducted under the provisions of 14 CFR Part 91.[10]

The helicopter's route passed just east of Birmingham, Alabama, and, about 1548, the pilot contacted Birmingham Terminal Radar Approach Control (BHM TRACON) to request radar flight-following. The controller instructed the pilot to set the aircraft's transponder to 0335 but was unable to establish reliable radar contact.[11] Because the controller could not see the aircraft target consistently, he was unable to provide radar service. The controller instructed the

[10] Additional information about this accident, NTSB case number MIA07FA098, can be found on the NTSB's website at <http://www.ntsb.gov/ntsb/query.asp>.

[11] Review of BHM radar data showed that the helicopter's altitude encoder was defective and most often reported that the helicopter was above 12,000 feet. This resulted in the helicopter being filtered from the controller's radar display by the radar data processing system because it appeared to be above BHM TRACON's airspace. The helicopter was actually cruising at approximately 1,100 to 1,300 feet.

pilot to change back to code 1200, the default code used for uncontrolled flights, and cleared the pilot to change frequencies.

The helicopter did not arrive at Muscle Shoals as planned. The pilot's family reported the flight overdue to Lockheed flight service. An ALNOT was issued about 2315 local time, and the AFRCC began to coordinate a search for the aircraft. According to the mission log, in response to the ALNOT, BHM TRACON reported that the pilot had contacted the facility between 1600 and 1700. AFRCC asked the Memphis Air Route Traffic Control Center to provide radar data, but the facility reported that it was unable to provide the requested data because no one was on duty who could produce the needed report.

About 0215 on May 14, BHM TRACON reported that it was unable to provide any further information on its contact with the pilot because only one controller was on duty, and he could not review the recordings.

About 0320, USAF radar analysts assisting in the search reported that they were unable to identify a radar track on the helicopter. According to a summary placed in the mission log about 0703 the day after the accident, the lack of FAA radar data was preventing the CAP radar analyst from contributing to the search, and BHM TRACON had still not provided any further details on its contacts with the accident helicopter. About 0912, BHM TRACON controllers reported the helicopter's last known position as the last observed 0335 code, without noting that the flight continued on code 1200. More than 4 hours later, BHM TRACON controllers provided an updated position based on the continued 1200 codes. The new position was passed from the AFRCC to the CAP about 1414. The CAP continued the search, integrating the new information into the search plan along with other leads provided by USAF analysts. About 1921, the CAP radar analyst confirmed the accuracy of the last position supplied by BHM TRACON controllers, stating that three different radars showed the helicopter's flight ending near that position. (See figure 2.) About 1320 on May 15, the Alabama CAP notified the AFRCC that the accident helicopter had been located, approximately 36 hours after the aircraft was reported missing.

NTSB investigators reviewed the information used to support the search for the helicopter and reviewed AFRCC's efforts to obtain FAA data needed to help locate it. It was immediately apparent that all the information needed to locate the helicopter was recorded at BHM TRACON during and after its contact with the pilot. The controller's instruction to set the aircraft's transponder to 0335 served to positively identify the aircraft. Even though the controller was unable to see the helicopter on his radar display, the targets were recorded by the radar data processing system. After the pilot changed the transponder setting from 0335 to 1200, the target trail continued directly to the accident site. Had the BHM TRACON radio communications and radar data been made available to a trained radar analyst immediately after the facility responded positively to the ALNOT, the crash location likely would have been available within minutes, and search teams likely would have been able to reach the accident site much sooner.

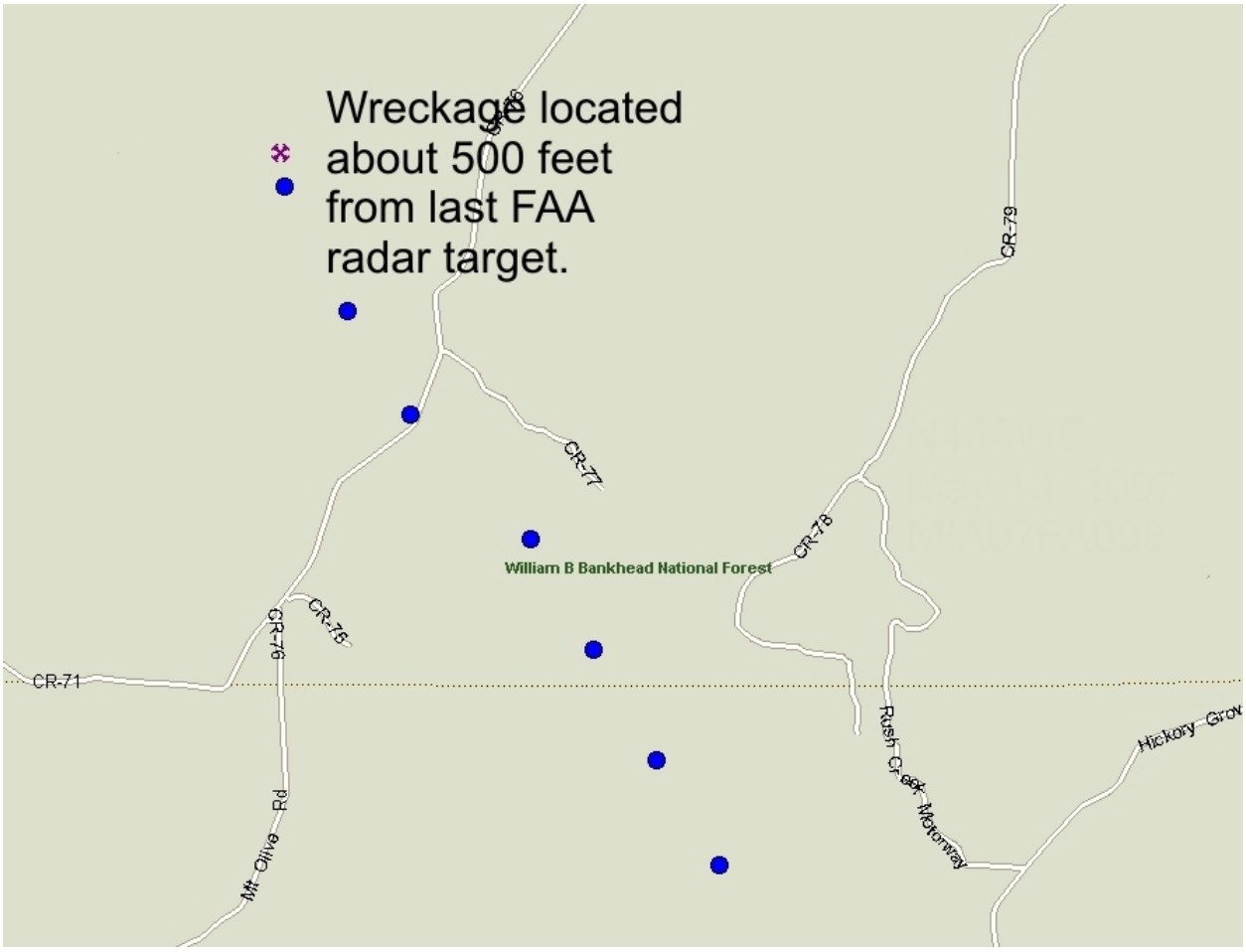

Figure 2. Map of the Moulton, Alabama, accident area overlaid with radar targets leading to N468WE's wreckage about 500 feet from the last FAA radar target.

Boynton Beach, Florida

On October 27, 2007, about 2012 eastern daylight time, a Piper PA-28-181, N8155C, was substantially damaged when it impacted trees and terrain in Boynton Beach, Florida, following a loss of engine power. The certificated flight instructor and the private pilot were fatally injured, and the passenger was seriously injured. Night visual meteorological conditions prevailed, and no flight plan had been filed for the instructional flight, which was operating under the provisions of 14 CFR Part 91.[12]

The investigation of this accident is ongoing, but, according to preliminary ATC information, radar contact with the accident airplane was initially established by Palm Beach Approach (PBI) about 1813, shortly after the airplane departed its base at Palm Beach County Park Airport, Lantana, Florida. The pilots conducted practice instrument approaches at four airports, with the last approach occurring at Pompano Beach Airpark, Pompano Beach. In the course of communications with the PBI approach controller, the pilot indicated that he was

[12] Additional information about this accident, NTSB case number NYC08FA020, can be found on the NTSB's website at <http://www.ntsb.gov/ntsb/query.asp>.

unable to maintain altitude because of engine trouble. The pilot's final transmission indicated that he intended to land on a road.

According to FAA communications transcripts, about 2010 the PBI approach controller asked for the assistance of another pilot in the area in locating the accident airplane. About 2014, a second pilot contacted the controller and offered to help, and about 2017, that pilot reported receiving an ELT signal. Over the next hour, several other pilots assisted in the search and were able to determine the general location of the ELT signal. About 2129, a Palm Beach County Sheriff's Office helicopter crew reported to the controller that they had located the wreckage. (See figure 3.)

Figure 3. Map of the Boynton Beach, Florida, accident area overlaid with radar targets leading to N8155C's wreckage about 900 feet west of the last FAA radar target.

Postaccident review of FAA radar data recorded at PBI showed that the aircraft was last observed about 2011, westbound and descending through 100 feet. The wreckage was located on a residential golf course about 900 feet west of the last radar target. The NTSB is concerned that, even though the PBI controller noticed the accident immediately and solicited assistance in locating the aircraft from nearby pilots and a local law enforcement helicopter, it still took an hour and 18 minutes to find the wreckage and the surviving passenger. Because of the dark night conditions, accurate location information would have helped guide responders to the correct location. FAA radar data contained a direction of flight and last known position very close to the location of the wreckage; however, that information was not made available to local responders to assist in the search. According to information provided by PBI, no technically qualified persons were available when the accident occurred to search the radar data recordings and produce the needed radar data. The NTSB believes that if the last recorded radar latitude and

longitude position and direction of flight had been supplied to local responders, the time needed to find the aircraft and rescue the survivor would have been substantially reduced.

District Heights, Maryland

On September 27, 2008, about 2358 local time, Trooper 2, a medical evacuation helicopter, N92MD, operated by the Maryland State Police (MSP), crashed in District Heights, Maryland, while attempting to transport two automobile accident victims to Prince George's Hospital Center, Cheverly, Maryland.[13] The pilot, a flight paramedic, a local emergency medical technician, and one of the automobile accident victims were killed. The second automobile accident victim survived the helicopter crash and was eventually rescued. The NTSB is concerned that it took about 2 hours to locate the downed helicopter despite the crash having occurred in an urban area while operating under IFR and receiving radar service from the FAA.

Trooper 2 had departed from a landing zone in Waldorf, Maryland, intending to transport the two medical patients to Prince George's Hospital Center. Because of low ceilings and poor visibility in the area, the pilot was unable to locate the hospital helipad and elected to divert to Andrews Air Force Base (ADW). He contacted Potomac Consolidated TRACON (PCT) and was subsequently cleared for the ILS approach to runway 19R at ADW. As the aircraft intercepted the final approach course, the pilot was instructed to contact the ADW tower and did so. About 2 minutes later, when Trooper 2 was about 4 nm north of the runway, the helicopter began a rapid descent that ended on a road in Walker Mill State Park. The last radar target for Trooper 2 was recorded about 2357:50 at 700 feet. (See figure 4.)

The tower controller noticed that Trooper 2 was no longer visible on radar about 2359. Within a few minutes, initial actions to locate the helicopter began. In radio contacts with the ADW fire chief and phone conversations with the PCT acting operations manager, the tower controller reported losing radar contact with Trooper 2 when the helicopter was about 2 to 2.5 nm north of the airport.

As the ground search commenced, the MSP Forestville barrack supervisor requested that the ADW tower controller provide a latitude and longitude location for the aircraft. The tower controller was unable to supply the information, replying that the coordinates would be “whatever two miles north of the field is.”

In postaccident interviews, PCT management reported that PCT and ADW have an automation tool known as CountOps, which can produce an accurate last known latitude and longitude position of aircraft as soon as the aircraft is noted missing. However, CountOps was not used after Trooper 2 crashed. The ADW controller had never been trained on the locating capability of the software, likely because that capability was not the software’s primary purpose.

[13] The NTSB’s final report on this accident can be found on the NTSB’s website at <http://www.ntsb.gov/Publictn/A_Acc1.htm>.

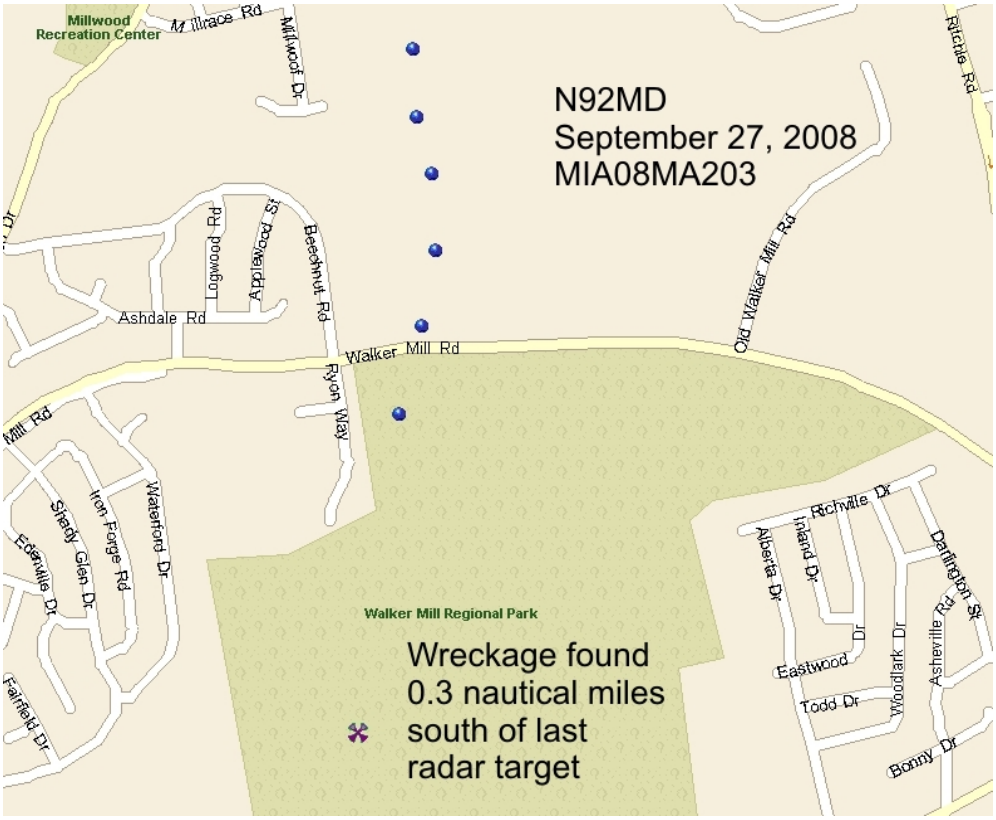

Figure 4. Map of the District Heights, Maryland, accident area overlaid with radar targets leading to Trooper 2's wreckage about 0.3 nm south of the last FAA radar target.

The PCT operations manager did not obtain or refer to any recorded PCT radar data after he was advised of the accident. The FAA provided no assistance in locating the crash other than the ADW controller's recollection of the last position shown on the tower radar display. Following the accident, ground searchers were provided with conflicting and inaccurate information from various sources about the helicopter's last known position. Had FAA radar data been used to provide a location to the search teams, the confusion would likely have been reduced, and the searchers could have immediately gone to the correct area. The wreckage was eventually located about 0.3 nm south of the last target, approximately 2.5 nm from ADW.

Addressing Weaknesses in Data Analysis and Dissemination

The failure of the FAA to provide accurate, complete, and readily available radar data early in the SAR process led to unnecessary delays, as exemplified in the above accidents. For example, in the Philipsburg, Pennsylvania, accident, ZNY transmitted an ALNOT containing an incorrect last known position and did not provide an update to the AFRCC even though the facility's recorded data contained a much more accurate location. Radar data recorded by BHM TRACON eventually led searchers directly to the crash site, but not until a day and a half after the aircraft was reported overdue because BHM TRACON could not provide complete and timely information to AFRCC. Similarly, after the Boynton Beach, Florida, accident, ground searchers would have had a last known position within 900 feet of the crashed airplane within minutes of the accident if PBI approach had provided a location based on the best available radar data. In the District Heights, Maryland, accident, the PCT operations manager on duty when

Trooper 2 crashed did not examine recorded radar data for the flight or consult software tools such as CountOps to locate the helicopter. PCT supplied no information to assist the search teams.

FAA directives[14] and the postaccident reporting form (Form 8020-3, "Facility Accident/Incident Notification Record") do not provide any guidance on expeditious provision of FAA radar or other location data to support SAR response or any direction to managers or controllers on assisting SAR responders in locating downed aircraft, other than the requirement to issue an ALNOT when an aircraft is believed to be overdue. Therefore, the NTSB recommends that the FAA amend Order 7110.65, "Air Traffic Control," to require that, when radar or other location data are available to air traffic controllers that indicate to a reasonable likelihood the location of a downed aircraft, the information be immediately provided to appropriate local first responders and the AFRCC.

The circumstances of these accidents and associated SAR responses also indicate that FAA SAR assistance has been limited by a lack of personnel qualified to provide assistance. In the Moulton, Alabama; Boynton Beach, Florida; and District Heights, Maryland, accidents, ATC personnel explicitly said that the controllers available lacked qualified personnel to provide the needed data. In the Philipsburg, Pennsylvania, accident, ATC personnel provided incorrect location information. The data available to ATC personnel are often complex, and SAR situations present a variety of complications with which most ATC personnel are unfamiliar. Providing adequate data analysis often requires expert knowledge so that situations can be assessed and all relevant radar and communications data expeditiously obtained and provided to searchers in a useful form. The expertise needed includes

- ability to identify all FAA resources that may be able to provide information useful for SAR purposes;
- familiarity with the different types of ATC facilities;
- ability to identify all radar sites providing coverage in the area of interest;
- familiarity with the data recording capabilities of those facilities and the use of appropriate data extraction tools;
- network access as necessary to remotely retrieve SAR-related data;
- ability to analyze, organize, deliver, and explain FAA data to SAR providers; and
- authorization to require support from local facilities to provide data that are not remotely accessible, including directing the use of overtime and after-hours staff support if necessary to support a SAR activity.

[14] These directives include FAA Order 7110.65, "Air Traffic Control;" Order 7210.3, "Facility Operation and Administration;" and Order 8020.16, "Air Traffic Organization Aircraft Accident and Incident Notification, Investigation, and Reporting."

The FAA currently has limited ability to provide expert help to its ATC personnel and, as shown by the accidents cited above, has no standard procedure by which ATC personnel obtain expert help when SAR efforts are needed. Establishing a group of FAA SAR experts would be an efficient way of providing assistance to ATC personnel. Therefore, the NTSB recommends that the FAA establish and staff a technical assistance group charged with providing immediate assistance at all times to ATC facilities and SAR providers in any SAR situation. Such a group should be 1) able to identify all FAA resources that may be able to provide information useful for SAR purposes; 2) familiar with the different types of ATC facilities; 3) able to identify all radar sites providing coverage in the area of interest; 4) familiar with the data recording capabilities of those facilities and the use of appropriate data extraction tools; 5) provided with network access as necessary to remotely retrieve SAR-related data; 6) able to analyze, organize, deliver, and explain FAA data to SAR providers; and 7) authorized to require support from local facilities to provide data that are not remotely accessible, including directing the use of overtime and after-hours staff support if necessary to support a SAR activity. At least one member of this group should be available 24 hours a day, every day, on a rotating basis, to initiate SAR assistance.

The NTSB further recommends that the FAA amend Orders 7110.65, "Air Traffic Control," and 8020.16, "Air Traffic Organization Aircraft Accident and Incident Notification, Investigation, and Reporting," to require any ATC facility that becomes aware of a possible need for SAR to immediately notify the technical assistance group created pursuant to Safety Recommendation A-10-6 and make all relevant data available for its use.

Software, such as CountOps, which was available to the controllers at the time of the District Heights, Maryland, accident, can further expedite information sharing by performing simple radar data analysis. Although such software cannot substitute for an expert, overall analysis of SAR data needs, CountOps or similar software could allow nontechnical staff to quickly provide more accurate location information to SAR responders. Therefore, the NTSB recommends that the FAA provide to all ATC facilities software, and appropriate training in its use, that will permit nontechnical ATC operational personnel to immediately access latitude, longitude, and altitude data related to, at a minimum, the final 2 minutes of flight for aircraft operating on a specified transponder code.

Finally, the helicopter involved in the District Heights, Maryland, accident was equipped with automatic dependent surveillance–broadcast (ADS-B) position reporting, which provided location information. ADS-B data are not used by FAA ATC facilities in the Washington, DC, area; however, the data are recorded by an FAA contractor as part of a test program. The contractor informed NTSB investigators that there are about 31 aircraft in the Washington, DC, area equipped with ADS-B. The list of equipped aircraft and the data from these aircraft are not immediately accessible to FAA facilities or the AFRCC, and, thus, those facilities may not use this valuable resource for locating aircraft. As the FAA incorporates future surveillance systems that rely on ADS-B data, more aircraft will have ADS-B equipment, and an ADS-B-equipped aircraft will likely become the target of a SAR mission. Therefore, the NTSB recommends that the FAA establish procedures for identifying aircraft equipped with ADS-B capabilities to personnel responsible for SAR and to the technical assistance group created pursuant to Safety Recommendation A-10-6 and for providing expeditious access to ADS-B location data when needed to support SAR activities.

Therefore, the NTSB makes the following recommendations to the Federal Aviation Administration:

Develop, in conjunction with the Air Force Rescue Coordination Center, specific phraseology for communicating about the location, time, and nature of emergency locator transmitter signals and emergency beacon codes. (A-10-1)

Amend Federal Aviation Administration Order 7110.65, "Air Traffic Control," to prescribe the use of the phraseology requested in Safety Recommendation A-10-1. (A-10-2)

Provide training for all Federal Aviation Administration personnel who may be required to interact with the Air Force Rescue Coordination Center (AFRCC), ensuring that personnel understand the AFRCC's incident reporting process and recognize that new incidents are always assigned a unique incident number. (A-10-3)

Require air traffic control facilities to enter all Air Force Rescue Coordination Center (AFRCC) contacts on Federal Aviation Administration Form 7230-4, "Daily Record of Facility Operations," and, in circumstances where that contact results in the AFRCC assigning a new incident number to the event, require facilities to contact the AFRCC at least once per shift for a status update until the AFRCC advises that an incident has been resolved. (A-10-4)

Amend Federal Aviation Administration Order 7110.65, "Air Traffic Control," to require that, when radar or other location data are available to air traffic controllers that indicate to a reasonable likelihood the location of a downed aircraft, the information be immediately provided to appropriate local first responders and the Air Force Rescue Coordination Center. (A-10-5)

Establish and staff a technical assistance group charged with providing immediate assistance at all times to air traffic control (ATC) facilities and search and rescue (SAR) providers in any SAR situation. Such a group should be 1) able to identify all Federal Aviation Administration (FAA) resources that may be able to provide information useful for SAR purposes; 2) familiar with the different types of ATC facilities; 3) able to identify all radar sites providing coverage in the area of interest; 4) familiar with the data recording capabilities of those facilities and the use of appropriate data extraction tools; 5) provided with network access as necessary to remotely retrieve SAR-related data; 6) able to analyze, organize, deliver, and explain FAA data to SAR providers; and 7) authorized to require support from local facilities to provide data that are not remotely accessible, including directing the use of overtime and after-hours staff support if necessary to support a SAR activity. At least one member of this group should be available 24 hours a day, every day, on a rotating basis, to initiate SAR assistance. (A-10-6)

Amend Federal Aviation Administration Orders 7110.65, "Air Traffic Control," and 8020.16, "Air Traffic Organization Aircraft Accident and Incident Notification, Investigation, and Reporting," to require any air traffic control facility that becomes aware of a possible need for search and rescue to immediately notify the technical assistance group created pursuant to Safety Recommendation A-10-6 and make all relevant data available for its use. (A-10-7)

Provide to all air traffic control (ATC) facilities software, and appropriate training in its use, that will permit nontechnical ATC operational personnel to immediately access latitude, longitude, and altitude data related to, at a minimum, the final 2 minutes of flight for aircraft operating on a specified transponder code. (A-10-8)

Establish procedures for identifying aircraft equipped with automatic dependent surveillance–broadcast (ADS-B) capabilities to personnel responsible for search and rescue (SAR) and to the technical assistance group created pursuant to Safety Recommendation A-10-6 for providing expeditious access to ADS-B location data when needed to support SAR activities. (A-10-9)

The NTSB has also issued one recommendation about SAR activities to the AFRCC.

In response to the recommendations in this letter, please refer to Safety Recommendations A-10-1 through -9. If you would like to submit your response electronically rather than in hard copy, you may send it to the following e-mail address: correspondence@ntsb.gov. If your response includes attachments that exceed 5 megabytes, please e-mail us asking for instructions on how to use our secure mailbox. To avoid confusion, please use only one method of submission (that is, do not submit both an electronic copy and a hard copy of the same response letter).

Chairman HERSMAN, Vice Chairman HART, and Member SUMWALT concurred in these recommendations.

[Original Signed]

By: Deborah A.P. Hersman
Chairman