



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: December 4, 2006

In reply refer to: A-06-78 through -81

Honorable Donald H. Rumsfeld
Secretary
Department of Defense
The Pentagon
Washington, D.C. 20301-1155

On November 27, 2004, about 0820 Afghanistan time,¹ a Construcciones Aeronauticas Sociedad Anonima C-212-CC (CASA 212) twin-engine, turboprop airplane, N960BW, operated by Presidential Airways, Inc., of Melbourne, Florida, was destroyed when it collided with mountainous terrain near Bamiyan, Afghanistan.² The captain, the first officer, and the four passengers were killed;³ one passenger survived for at least 8 hours, but he died before help arrived. The flight was operated under a Department of Defense (DoD) Air Mobility Command contract⁴ under the provisions of 14 *Code of Federal Regulations* (CFR) Part 135. Daylight visual meteorological conditions prevailed. The flight was en route from Bagram, Afghanistan, to Farah, Afghanistan, on the first leg of a mission that was to end with the airplane's return to Bagram.⁵ The operator was unaware the airplane was missing until about 6 hours after it crashed.⁶

¹ Afghanistan time is coordinated universal time plus 4 hours 30 minutes. All times are reported in Afghanistan time, unless otherwise indicated.

² At the request of the Transitional Islamic Government of Afghanistan, Ministry of Civil Aviation & Tourism, the National Transportation Safety Board accepted delegation of the accident investigation in accordance with paragraph 5.1 of Annex 13 to the Convention on International Civil Aviation.

³ All personnel on board the airplane were U.S. citizens. One passenger was mechanic-certificated and was employed by the contractor; the other three passengers were active-duty U.S. Army soldiers.

⁴ Under contract FA4428-04-D-0036, dated September 20, 2004, Presidential Airways was to provide on-demand air transportation services for U.S. military personnel and cargo to remote sites within Afghanistan, Uzbekistan, and Pakistan. Per the contract, all flights were to be performed in accordance with 14 *Code of Federal Regulations* Part 135.

⁵ The flight's entire mission was to fly from Bagram to Farah, then to Shindand, Afghanistan, and then return to Bagram. The flight crew had planned to divert to Kandahar, Afghanistan, if they were unable to land at Shindand due to potential reduced visibilities because of blowing dust.

⁶ At the time the operator was notified that the airplane was missing, the airplane was more than 4 hours overdue for its expected arrival at Farah, its first destination.

The National Transportation Safety Board determined that the probable cause of the accident was the captain's inappropriate decision to fly a nonstandard route and his failure to maintain adequate terrain clearance, which resulted in the inflight collision with mountainous terrain.⁷ Factors were the operator's failure to require its flight crews to file and to fly a defined route of flight, the operator's failure to ensure that the flight crews adhered to company policies and Federal Aviation Administration (FAA) and DoD Federal safety regulations, and the lack of in-country oversight by the FAA and the DoD of the operator. Contributing to the death of one of the passengers was the operator's lack of flight-locating procedures and its failure to adequately mitigate the limited communications capability at remote sites.

The Safety Board is concerned that the unique risks presented by operations in remote overseas locations have not been adequately addressed for civilian contractors that provide air transportation services to the U.S. military. As a result of this accident investigation, the Safety Board is issuing four safety recommendations to the DoD that address oversight of civilian contract operations, real-time flight tracking, aircraft emergency locator transmitters (ELTs), and ELT signal-monitoring services. These recommendations are derived from the Board's investigation and are consistent with the evidence found and the analysis performed; information supporting the recommendations is discussed below. The Board would appreciate a response from you within 90 days addressing the actions you have taken or intend to take to implement our recommendations.

Background Information

Before taxiing for takeoff on the accident flight, the crew contacted the Bagram air traffic controller and reported an intended departure heading to the south. They departed instead to the northwest without providing amended heading information to the controller. The northwest departure was not consistent with the operator's typical route to Farah.

The unpressurized airplane collided with mountainous terrain at an elevation of 14,650 feet as the captain attempted to reverse the airplane's course at the end of a box canyon. The flight crewmembers' discussions captured by the cockpit voice recorder (CVR) indicated they chose to fly a nonstandard route through a valley, they used a global positioning system (GPS) to navigate, and they deliberately flew the airplane at low altitude through the valley for "fun."

Autopsy examination reports indicated the captain, first officer, civilian passenger, and two of the military passengers died of blunt force injuries upon impact. The third military passenger, however, initially survived the crash but later died of blunt force injuries that were complicated by hypoxia and hypothermia. Military first responders arrived at the accident site on November 30, 2004, 3 days after the crash, because of difficulty locating the wreckage, followed by weather delays.

⁷ The brief about this accident, IAD05FA023, can be found on the Safety Board's Web site at <<http://www.nts.gov>>.

The Safety Board reviewed the passenger's autopsy and determined that none of the injuries he sustained in the crash were immediately life-threatening. The Board also examined a photograph of a specific internal injury, considered additional information provided by the medical examiner, and determined that the evidence was consistent with a minimum of 8 hours of survival. The Board concludes that, had the passenger received medical assistance within that time frame, followed by appropriate surgical intervention, he most likely would have survived.

Oversight of Civilian Contractor Operations

The Safety Board noted numerous deficiencies in the flight crewmembers' performance: they did not adequately plan for the flight; they did not initiate a climb in sufficient time to clear the terrain; they subsequently did not execute a timely course reversal even though the mechanic-certificated passenger⁸ prompted them to take action; and they failed to use supplemental oxygen as required by Federal regulations for the altitudes at which the flight was operating. The captain and the first officer were both experienced in mountain flying, and the CVR recording of their discussions indicated that they were aware the airplane was approaching the terminus of the box canyon more than 15 minutes before the crash, yet they did not take appropriate action to prevent the collision.

The Safety Board also noted numerous deficiencies in Presidential Airways' Part 135 operations⁹ in Afghanistan: the dispatch procedures were inadequate in that the operator did not ensure that specific routes of flight were defined and flown; the flight-locating procedures were inadequate in that the operator did not consistently track flight arrivals at each remote location in a timely manner; and the operator did not adequately mitigate the limited communications capability at some remote sites. This lack of a specific route structure, flight-locating procedures, and adequate communications contributed to the death of the one passenger who initially survived the crash. Further, the operator did not provide sufficient oversight of and guidance to its flight crews and did not ensure that its operations in Afghanistan were conducted in compliance with Part 135 regulations.

While the Safety Board recognizes that the operator is fully responsible for operating in accordance with the Part 135 regulations, the FAA and the DoD are responsible to provide oversight of such operations, and there are FAA and DoD regulations that pertain specifically to many of the areas of deficiency noted in this accident. By allowing such deficiencies to remain uncorrected, neither the FAA nor the DoD provided adequate oversight of Presidential Airways' operations in Afghanistan. The Safety Board is concerned that the remoteness of such operations presents unique oversight challenges that have not been adequately addressed for civilian contractors that provide air transportation services to the U.S. military overseas.

The DoD attempted to compel safe operations by issuing a contract that required the operator to hold a Part 135 operating certificate and to conduct flights in accordance with Part 135 regulations. In the year before the accident, FAA inspectors had performed routine

⁸ According to the operating specifications for the CASA 212 airplane, a mechanic is not a required crewmember. During the accident flight, the mechanic-certificated passenger was seated in the cockpit jumpseat.

⁹ Presidential Airways held a Part 135 operating certificate and also conducted operations in the United States.

oversight by visiting Presidential Airways' base of operations in Florida more than 100 times and found no major discrepancies with the operator's U.S. operations. Although the FAA had also approved Presidential Airways to conduct Part 135 operations in Afghanistan, it did not provide, and was not required to provide, personnel who could directly oversee the operations there. As a result, the operational deficiencies noted with the accident flight were not evident in Presidential Airways' U.S. operations but were present in its Afghanistan operations.

FAA Order 1800.56G, "National Flight Standards Work Program Guidelines," outlines the FAA policy regarding required surveillance of Part 135 on-demand operators. While the Safety Board recognizes that the FAA may have performed the required surveillance items on Presidential Airways' facilities, aircraft, and flight crews in the United States, thus rendering the FAA oversight of the operator, as a whole, in accordance with its standard guidelines, there is no evidence that such oversight occurred in Afghanistan. The Safety Board concludes that, without being present on site, the FAA cannot provide adequate oversight of civilian contractors that provide air transportation services in remote locations overseas.

Moreover, FAA Order 8400.10, "Air Transportation Operations Inspector's Handbook," states, "en route inspections are one of the most effective methods for accomplishing surveillance objectives and responsibilities," and the primary objective of these inspections is to evaluate in-flight operations, including, but not limited to, crew coordination, cockpit procedures, and crewmember proficiency. Although FAA Order 1800.56G requires inspectors to conduct en route inspections for Part 121 operations and Part 135 scheduled operations, it does not require en route inspections for Part 135 on-demand charter operations, such as the accident flight.

Operators often suggest that the need for privacy for their charter clients and the unscheduled nature of their operations make it difficult for FAA inspectors to be available for on-demand flights. However, many of the Presidential Airways flights in Afghanistan departed within known time slots, were repeated daily, and were based out of a single location, thus making in-flight observations feasible for those operations. While pilots may be on their "best behavior" when an inspector is on board the aircraft, en route surveillance provides inspectors the opportunity to observe operations as they take place on a day-to-day basis and to detect deficiencies before they progress into accident factors. In the case of this operation, an on-site FAA inspector may have observed route deviations, noted that the flights could not always check in with the operations center, or surmised that the pilots were flying without supplemental oxygen during some higher altitude flights.

In addition to the FAA requirements, Presidential Airways, under contract to AMC, was required to adhere to the provisions of 32 CFR Part 861 regarding flight crew training, qualifications, and proficiency. Title 32 CFR Part 861 also requires that the DoD approve and monitor contract operators for compliance with contract provisions, including safety provisions. Such monitoring should entail initial and recurring on-site safety surveys and evaluation, and the DoD oversight requirements are intended to complement the FAA requirements.¹⁰ According to 32 CFR 861.4(c)(3), a consideration in the DoD's evaluation process is that an "air taxi operator

¹⁰ The requirements are outlined in 32 CFR 861.4(a) and (e).

is expected to demonstrate some type of effective flight following capability.” While the DoD had quality assurance personnel in Afghanistan who were tasked to ensure that Presidential Airways complied with the contract, the Safety Board found no evidence to suggest that DoD personnel ensured that the operator demonstrated some type of effective flight-following capability or ensured any oversight. While the Safety Board recognizes that the DoD relies on the FAA to ensure Part 135 oversight, the DoD’s adherence to its own regulations that compel it also to conduct operator oversight and to ensure FAA oversight is even more critical in remote locations where the FAA has no on-site personnel.

The oversight provisions in 32 CFR Part 861 and FAA Orders 1800.56G and 8400.10, if performed, provide valuable information on the safety performance of a carrier. While FAA oversight occurred at Presidential Airways’ base of operations in Florida, this was not sufficient to detect the discrepancies that existed within Presidential Airways’ Afghanistan operations at the time of the accident. The Board concludes that there is a strong probability that, had the FAA or the DoD conducted direct, in-country oversight of the DoD contract operations, the FAA or the DoD would have detected the deficiencies in the operator’s flight-locating and other procedures and prevented the manner in which the accident flight was conducted.

Moreover, because of the uncontrolled airspace and additional risks associated with remote overseas locations, it is critical that the FAA and the DoD ensure that operators comply with the safety regulations so that passengers are transported by the safest possible means. The Safety Board concludes that, had the FAA and the DoD coordinated their oversight responsibilities to ensure that effective oversight of civilian operations in Afghanistan was performed, many of the deficiencies noted during this investigation could have been eliminated.

Therefore, the Safety Board believes that the DoD should coordinate with the FAA to ensure oversight, including periodic en route inspections, is provided at all contractor bases of operation for civilian contractors that provide aviation transportation to the U.S. military overseas under Part 121 or Part 135.

Flight-locating Requirements

Presidential Airways dispatched the Part 135 contract flights from its operations center at Bagram. The crews filed company flight plans that contained only information on each mission’s destinations; the operator did not maintain specific route information for each leg of flight, and the program site manager assumed the crews followed typical routes.

Presidential Airways had no written flight-locating procedures for its DoD contract flights. According to the director of operations, the normal procedure was for pilots to report their remote site arrivals to the Presidential Airways operations center at Bagram. Communications capability in Afghanistan was limited, however, and sometimes crews were unable to report their arrivals. The director of operations stated that crews could instead report their arrival time at a remote site upon their return to Bagram at the completion of the mission. Under this reporting system, a flight (such as the accident flight, which never reached its first destination) could be missing for several hours before a problem would be detected by the operations center.

The Presidential Airways program site manager learned of the missing airplane after military personnel at Farah initiated an inquiry about its status; this was about 1415, when the airplane was about 30 minutes overdue for its return to Bagram. Military air search and rescue efforts then commenced about 1530; by that time, the injured survivor had been awaiting rescue for about 7 hours since the airplane went down.

Because Presidential Airways did not maintain specific flight route information for the purpose of flight locating, the rescue effort was further delayed when the first 5 hours of aerial daylight searches were focused in areas where the airplane had not flown. Military search and rescue personnel were initially dispatched to search the area along the flight's planned alternate destination route and then the area south of Bagram on the basis of the operator's assumption that the flight had followed the typical route.

The military's radar data of the airplane's last known position,¹¹ which showed the airplane actually departed to the northwest, were not provided to searchers until about 2100. Search aircraft were then dispatched to the northern area, and searches continued into the evening. The following morning, the wreckage was located within a few hours of searching the northern area in daylight, but this was nearly 24 hours after the airplane crashed. According to the military, weather did not significantly affect search and rescue efforts on the day of the accident. By the time the accident site was identified the following day, however, adverse weather had moved into the area, and rescue personnel could not reach the site until 0630 on November 30, 2004.

While the Safety Board recognizes that the limited radar, radio, and telephone communications capability in remote locations presents unique challenges in implementing flight-locating procedures, equipment that can help overcome these challenges is readily available and widely used. Military-operated aircraft in remote locations are equipped with a digital real-time tracking system that enables military personnel to monitor aircraft movements. Moreover, FAA-approved devices are available for civilian use that allow for real-time tracking through integrated use of on-board equipment, satellites, and international data networks that enable the user to monitor aircraft movements from a computer with tracking software. Such real-time tracking systems enable a user to know the precise geographic location, altitude, speed, and heading of equipped airplanes at all times.

The Safety Board concludes that had the operator implemented real-time flight tracking, search and rescue personnel would have most likely been dispatched sooner and to the airplane's actual flight route, thus increasing the likelihood that rescuers could have reached the survivor before he died. Therefore, the Safety Board believes that the DoD should require that civilian contractors that provide aviation transportation to the U.S. military in remote locations equip each aircraft with a real-time tracking system.

¹¹ Because of radar coverage limitations, the flight's last recorded position was about 9.5 nm from Bagram at an altitude of 10,000 feet mean sea level.

Aircraft Emergency Locator Transmitters

The accident airplane was equipped with a 121.5-megahertz (MHz) ELT.¹² During the search operations conducted south of Bagram, 121.5-MHz signals were detected¹³ about 1730, but a search of the area revealed the signals did not originate from an aircraft ELT; several other alerts were detected throughout the evening and found to be unassociated with an ELT. During the subsequent searches northwest of Bagram, a 121.5-MHz signal was detected about 0500 on November 28, 2004, and a search aircraft located the wreckage at the signal location about 0815.

Although the airplane's ELT satisfied the FAA's minimum equipment requirement,¹⁴ ELT units are available with specific features that could better enhance the safety of operations in remote locations. ELT units that operate at a frequency of 406 MHz at a power output of 5 watts emit alerts as coded digital signals that are detected near-instantaneously by satellites. The coded signals provide aircraft registration and point of contact information, including the operator's registered telephone number. The position accuracy of 406-MHz ELTs is approximately 1 to 3 nm, and some units are enhanced with an integral GPS feature that enables position accuracy of less than 100 yards.

According to 59 *Federal Register* 32050, published on June 21, 1994, the FAA stated voluntary use of 406-MHz ELTs would provide a "definite enhancement" over the minimum requirements of the Federal Aviation Regulations and may offer "even more life-saving benefits ... for those operations conducted over water and in remote areas." DoD-contracted aircraft often operate in remote areas, making geolocation difficult. When an aircraft is equipped with only a 121.5-MHz ELT, search and rescue is more difficult because of the high number of false signals and the lack of position accuracy. The 406-MHz ELTs do not have similar weaknesses and would help identify crash locations more expeditiously.

The Safety Board concludes that the use of 406-MHz ELTs can provide more immediate and precise identification of crash locations, thus reducing search and rescue time and preventing the loss of life, such as the death of the CASA 212 passenger who waited hours for help. Thus, the Safety Board believes that the DoD should require that civilian contractors that provide aviation transportation to the U.S. military in remote locations equip each aircraft with a GPS-equipped 406-MHz ELT.

¹² Because 121.5-MHz ELT units transmit signals anonymously, the only way to ascertain whether or not an alert is an actual distress situation is to dispatch resources to investigate the location. The position accuracy of 121.5-MHz units is approximately 12 to 15 nm.

¹³ The signals were likely detected by military resources. According to the International Civil Aviation Organization, Afghanistan was not a participant in the international civilian search and rescue system known by the acronym COSPAS-SARSAT (Cosmicheskaya Sistyema Poiska Avariynich Sudov [translation: Space System for the Search of Vessels in Distress] – Search and Rescue Satellite-Aided Tracking). The COSPAS-SARSAT system utilizes satellite and ground equipment to detect and locate the signals from 121.5-MHz and 406-MHz ELTs, and it forwards the information to the search and rescue authorities of participating countries and organizations to expedite identification of crash locations.

¹⁴ According to 14 CFR 91.207, "Emergency locator transmitters," a U.S.-registered civil airplane must be equipped with an approved automatic-type ELT. According to 14 CFR 135.25, "Aircraft requirements," no certificate holder may operate an aircraft under this part, unless that aircraft "... meets the applicable airworthiness requirements of this chapter." The chapter includes the requirements outlined in Part 91.

More than 30 countries¹⁵ participate in the COSPAS-SARSAT program, which utilizes satellite and ground equipment to detect and locate the signals from 121.5-MHz and 406-MHz ELTs, and it forwards the information to the search and rescue authorities of participating countries. However, some countries, such as Afghanistan, do not have a program in place to use COSPAS-SARSAT to locate ELT signals. Therefore, the Safety Board believes that DoD should provide ELT signal-monitoring services for civilian contractor flights that provide aviation transportation to the U.S. military in remote locations when those flights are operated in a theater where the governing authority does not participate in COSPAS-SARSAT or has no arrangement for any other ELT signal-monitoring services.

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

Coordinate with the Federal Aviation Administration to ensure oversight, including periodic en route inspections, is provided at all contractor bases of operation for civilian contractors that provide aviation transportation to the U.S. military overseas under 14 *Code of Federal Regulations* Part 121 or Part 135. (A-06-78)

Require that civilian contractors that provide aviation transportation to the U.S. military in remote locations equip each aircraft with a real-time tracking system. (A-06-79)

Require that civilian contractors that provide aviation transportation to the U.S. military in remote locations equip each aircraft with a global positioning system-equipped 406-megahertz emergency locator transmitter. (A-06-80)

Provide emergency locator transmitter (ELT) signal-monitoring services for civilian contractor flights that provide aviation transportation to the U.S. military in remote locations when those flights are operated in a theater where the governing authority does not participate in *Cosmicheskaya Sistyema Poiska Avariynich Sudov* (translation: Space System for the Search of Vessels in Distress) – Search and Rescue Satellite-Aided Tracking or has no arrangement for any other ELT signal-monitoring services. (A-06-81)

The Safety Board also issued a recommendation to the FAA and one to the Islamic Republic of Afghanistan. In your response to this letter, please refer to Safety Recommendations A-06-78 (regarding oversight) or A-06-79 through -81 (regarding flight tracking and ELTs). If you need additional information, you may call (571) 223-3925.

¹⁵ COSPAS-SARSAT participants include the four parties to the COSPAS-SARSAT International Programme Agreement (Canada, France, Russia, and the United States), 24 ground segment providers, nine user states and two organizations, as follows: Algeria, Argentina, Australia, Brazil, Chile, People's Republic of China, Denmark, Germany, Greece, India, Indonesia, Italy, Japan, Republic of Korea, Madagascar, The Netherlands, New Zealand, Nigeria, Norway, Pakistan, Peru, Poland, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Thailand, Tunisia, Turkey, United Kingdom, Vietnam, the International Telecommunication Development Corporation, and the Marine Department of Hong Kong, China.

Chairman ROSENKER, Vice Chairman SUMWALT, and Members HERSMAN and HIGGINS concurred with these recommendations. Member Hersman filed a concurring statement.

[Original Signed]

By: Mark V. Rosenker
Chairman

Member Hersman, Concurring:

This accident presented a rather unique set of circumstances for the Safety Board to consider. We were asked to investigate a civilian accident that occurred in a theater of war while the operator was conducting operations on behalf of the Department of Defense. In analyzing the facts of this accident and in devising safety recommendations to address the problems that surfaced in the accident, the Safety Board has had some difficulty in determining whether recommendations should go to the FAA, as the Federal agency with safety oversight over civilian air operations, or to DoD, as the agency that had more actual control over the nature and conduct of this particular flight. Staff's recommendation for a solution to this dilemma is to issue recommendations to both agencies and then further recommend that DoD and FAA in the future articulate between themselves to what extent each agency has safety oversight in similar circumstances. Given the large number of these types of flights, it is perplexing that DoD and FAA have not executed a Memorandum of Understanding to memorialize the nature of their relationship with regard to these flights.

At first glance, the solution proposed by staff seems to be the best response for a third party Federal agency, like the NTSB, to take in this politically delicate situation. However, on a second look, it becomes apparent that it leaves open too many questions about control and responsibility and provides no real roadmap for dealing with the next atypical military contract/civilian air operation that ends in a crash.

Furthermore, the proposed recommendations in this report leave open the expectation that FAA can and does have oversight responsibility in a war theater halfway around the world, even though FAA does not have any oversight personnel assigned there. Our recommendations to FAA would imply that the Safety Board believes that FAA should have personnel assigned to oversee operations in Afghanistan, Iraq, and presumably any other military or intelligence theater, simply because DoD or other government entities have chosen to contract flights to civilian operators. This is an uncomfortable position for this Board member, given the fact that FAA resources are already stretched thin to effectively perform their safety oversight responsibilities for civilian air operations based in the U.S.

This position is even more difficult to defend given the fact that the NTSB, whose investigative authority also is limited to civilian air operations, did not have a presence in Afghanistan. In fact, the Safety Board's policy, with which I do not disagree, is to *not* send its investigators to war theaters or other scenes of hostile military activities. In the case of this accident, the Safety Board's analysis and report are based on facts and evidence gathered by DoD, because Safety Board investigators did not go to the scene. If this accident was the result of a civilian operation over which the FAA should have exercised its oversight authority, then it should have been considered a civilian accident in which the Safety Board should have exercised its investigative authority. This is not to suggest that the Safety Board should change its policy about deploying investigators to hostile military environments. Rather, this suggests that if the Safety Board did not consider the environment surrounding this accident safe enough in which to conduct a civilian accident investigation, it may not be appropriate to conclude that the FAA was wrong to have delegated its civilian safety oversight functions to the DoD in the same environment.

While I am signing this report as written, I continue to have reservations about the appropriateness of citing FAA in the probable cause for this accident when it is clear that this was a dangerous environment for their inspectors and clearly a military operation subject to DoD control. I believe that it would have been more fitting simply to address recommendations to the FAA so that this situation can be clarified and corrected in the future. The Safety Board, for example, could have recommended that FAA refuse to list countries on an operator's Ops Specs if there is no established mechanism for in-country oversight comparable to the FAA's domestic oversight.

I understand and appreciate the sensitivity of this accident investigation and the difficulty it presented the Safety Board in concluding a probable cause and making recommendations to address it. On the other hand, it is not unreasonable, given DoD's current inclination to contract many of its operations to civilians, that this situation will arise again.

[Original Signed]

Deborah A. P. Hersman