Synopsis of NTSB Alaska DPS Accident Hearing, Including Recommendations

NATIONAL TRANSPORTATION SAFETY BOARD
Public Meeting of November 5, 2014
(Information subject to editing)

Crash Following Encounter with Instrument Meteorological Conditions
After Departure from Remote Landing Site
State of Alaska, Department of Public Safety
Eurocopter AS350 B3 helicopter, N911AA
Talkeetna, Alaska
March 30, 2013

This is a synopsis from the NTSB's report and does not include the Board's rationale for the conclusions, probable cause, and safety recommendations. NTSB staff is currently making final revisions to the report from which the attached conclusions and safety recommendations have been extracted. The final report and pertinent safety recommendation letters will be distributed to recommendation recipients as soon as possible. The attached information is subject to further review and editing.

EXECUTIVE SUMMARY

On March 30, 2013, at 2320 Alaska daylight time, a Eurocopter AS350 B3 helicopter, N911AA, impacted terrain while maneuvering during a search and rescue (SAR) flight near Talkeetna, Alaska. The airline transport pilot, an Alaska state trooper serving as a flight observer for the pilot, and a stranded snowmobiler who had requested rescue were killed, and the helicopter was destroyed by impact and postcrash fire. The helicopter was registered to and operated by the State of Alaska, Department of Public Safety (DPS), as a public aircraft operations flight under 14 *Code of Federal Regulations* (CFR) Part 91. Instrument meteorological conditions (IMC) were reported in the area at the time of the accident. The flight originated at 2313 from a frozen pond near the snowmobiler's rescue location and was destined for an off-airport location about 16 mi south.

After picking up the stranded, hypothermic snowmobiler at a remote rescue location in dark night conditions, the pilot, who was wearing night vision goggles (NVG) during the flight, encountered IMC in snow showers within a few minutes of departure. Although the pilot was highly experienced with SAR missions, he was flying a helicopter that was not equipped or certified for flight under instrument flight rules (IFR). The pilot was not IFR current, had very little helicopter IFR experience, and had no recent inadvertent IMC training. Therefore, conducting the flight under IFR was not an option, and conducting the night flight under visual flight rules (VFR) in the vicinity of forecast IFR conditions presented high risks. After the helicopter encountered IMC, the pilot became spatially disoriented and lost control of the helicopter.

At the time the pilot was notified of the mission and decided to accept it, sufficient weather information was available for him to have determined that the weather and low lighting conditions presented a high risk. The pilot was known to be highly motivated to accomplish SAR missions and had successfully completed SAR missions in high-risk weather situations in the past.

The investigation also identified that the Alaska DPS lacked organizational policies and procedures to ensure that operational risk was appropriately managed both before and during the mission. Such policies and procedures include formal pilot weather minimums, preflight risk assessment forms, and secondary assessment by another qualified person trained in helicopter flight operations. These risk management strategies could have encouraged the pilot to take steps to mitigate weather-related risks, decline the mission, or stay on the ground in the helicopter after rescuing the snowmobiler. The investigation also found that the Alaska DPS lacked support for a tactical flight officer (TFO) program, which led to the unavailability of a trained observer on the day of the accident who could have helped mitigate risk.

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Any organization that wishes to actively manage safety as part of an effective safety management system must continuously strive to discover, understand, and mitigate the risks involved in its operations. Doing so requires the active engagement of front-line personnel in the reporting of operational risks and their participation in the development of effective risk mitigation strategies. This cannot occur if a focus of the organization's approach to dealing with safety-related events is to punish those whose actions or inactions contributed to the event. Although front-line personnel may, on rare occasions, be involved in intentional misdeeds, the majority of accidents and incidents involve unintentional errors made by well-intentioned personnel who are doing their best to manage competing performance and safety goals. An organizational safety culture that encourages the adoption of an overly punitive approach to investigating safety-related events tends to discourage the open sharing of safety-related information and to degrade the organization's ability to adapt to operational risks.

The Alaska DPS safety culture, which seemed to over-emphasize the culpability of the pilot in his past accident and events, appears to have had this effect. The pilot had adopted a defensive posture with respect to the organization, and he was largely setting his own operational limitations and making safety-related operational decisions in a vacuum, masking potential risks, such as the risk posed by his operation of helicopter NVG flights at night in low IFR conditions. This had a deleterious effect on the organization's efforts to manage the overall safety of its SAR operations. The investigation found that Alaska DPS had a punitive safety culture that impeded the free flow of safety-related information and impaired the organization's ability to address underlying safety deficiencies relevant to this accident.

It is important to note that the investigation was significantly aided by information recovered from the helicopter's onboard image and data recorder, which provided valuable insight about the accident flight that helped investigators identify safety issues that would not have been otherwise detectable. Images captured by the recorder provided information about where the pilot's attention was directed, his interaction with the helicopter controls and systems, and the status of cockpit instruments and system indicator lights, including those that provided information about the helicopter's position, engine operation, and systems. Information provided by the onboard recorder provided critical information early in the investigation that enabled investigators to make conclusive determinations about what happened during the accident flight and to more precisely focus the safety investigation on the issues that need to be addressed to prevent future accidents. For example, the available images allowed the investigation to determine that the pilot caged the attitude indicator in flight. This discovery resulted in the development of important safety recommendations related to attitude indicator limitations.

Although the recording device on board the accident helicopter was not required and was not a crash-protected system, the NTSB has a long history of recommending that the FAA require image recording devices on board certain aircraft. Some of these safety recommendations, which were either closed or superseded after the FAA indicated that it would not act upon

them, date as far back as 1999. The NTSB notes that, had the FAA required all turbine-powered, nonexperimental, nonrestricted-category aircraft operated under Parts 91, 135, and 121 to be equipped with crash-protected image recording system by January 1, 2007 (as the NTSB had recommended in 2003), 466 aircraft involved in accidents would have had image recording systems; in 55 of these accidents, the probable cause statements contained some element of uncertainty, such as an undetermined cause or factor.

FINDINGS

1. The pilot was qualified to fly search and rescue missions in visual meteorological conditions (but not instrument meteorological conditions) in the accident helicopter, and his performance was unlikely affected by medical factors, fatigue, or physical activities associated with the ground portion of the rescue activity.
2. The in-flight image recording and wreckage examinations showed that the helicopter and its engine were operating normally throughout the flight. No mechanical abnormalities with the helicopter were identified.
3. Soon after departure from the remote landing site, the helicopter likely encountered instrument meteorological conditions, which included low clouds, heavy snow, and near-zero-visibility conditions.
4. Although icing conditions were likely present during the accident flight, the performance of the helicopter does not appear to have been degraded at the time of the accident.
5. The pilot experienced a total loss of external visual references while operating in close proximity to terrain, which led him to attempt to transition to instrument flight.
6. The pilot's action to cage the attitude indicator outside those conditions under which it could be safely caged indicates that he distrusted the information he was seeing.
7. The pilot's caging of the attitude indicator made it very unlikely that he would regain control of the helicopter in instrument meteorological conditions.
8. The helicopter's erratic maneuvers are consistent with the pilot's spatial disorientation, a loss of control in flight, and his inability to recover the helicopter because of his lack of instrument experience and the lack of accurate attitude information.
9. When the pilot was contacted about the mission, forecasts indicated that conditions in the search area would be instrument flight rules and that forecast cloud ceilings and visibility would likely be below the pilot's Alaska Department of Public Safety weather minimums and possibly below his last known personal weather minimums.
10. At the time the pilot was notified about the stranded snowmobiler, sufficient information was available to indicate that the mission carried a high degree of risk due to the weather and low-lighting conditions.
11. The pilot's exceptionally high motivation for conducting search and rescue missions, which was influenced by multiple factors, likely played a part in his acceptance of the accident mission.
12. The pilot's exceptionally high motivation for search and rescue missions and past successes likely increased his risk tolerance and influenced his decision to continue flying in deteriorating weather conditions and risk a weather-related accident rather than accept the certain inconveniences and potential hazards associated with a precautionary landing.
13. The Alaska Department of Public Safety lacked organizational policies and procedures to ensure that operational risk was appropriately managed, such as formal pilot weather minimums, preflight risk assessment forms, or secondary assessment by another, qualified person trained in helicopter flight operations that would have encouraged the pilot to decline the mission or take steps to mitigate weather-related risks.
14. The Alaska Department of Public Safety's reliance on nonaviation-trained dispatchers for dispatch and flight-following support does not ensure that flight crews have adequate access to up-to-date weather information and qualified assistance with flight risk assessment tasks.

15. The Alaska Department of Public Safety did not provide the pilot with training that could have helped him recognize the hazards that precipitation and low light conditions pose to night vision goggles operations.

Pilots involved in search and rescue missions could benefit from initial and recurrent training on how to recognize, avoid, and safely recover from inadvertent flight into instrument meteorological conditions.

Operators lack adequate information about best practices for helicopter inadvertent instrument meteorological conditions training.

A tactical flight officer who was capable of assisting the pilot with aeronautical decision-making and operating the helicopter's navigational systems and displays could have helped mitigate risk.

Although a tactical flight officer (TFO) program had been recognized by Alaska Department of Public Safety personnel as a means of improving the safety of helicopter search and rescue operations, inadequate support for the program at various levels of the organization led to the unavailability of a TFO or other trained observer on the day of the accident.

The Alaska Department of Public Safety's investigation and analysis of the pilot's previous accident and other events were focused on the actions of the pilot and did not adequately identify and address systemic factors that could reduce the likelihood of a recurrence.

The Alaska Department of Public Safety had a punitive culture that impeded the free flow of safety-related information and impaired the organization's ability to address underlying safety deficiencies relevant to this accident.

As a result of inadequate high-level management support, the Alaska Department of Public Safety lacked a safety program that was capable of correcting latent deficiencies identified in this accident, including deficiencies in training and risk management.

All law enforcement agencies of each state, territory, and the District of Columbia that conduct public aircraft operations can benefit from an effective flight risk evaluation program, formalized dispatch and flight-following procedures, night vision goggles and inadvertent instrument meteorological conditions training for pilots, a formal tactical flight officer program, and a comprehensive safety management system.

Because of the lack of accurate, comprehensive information about attitude indication limitations in Federal Aviation Administration publications, such as the *Helicopter Flying Handbook*, *Instrument Flying Handbook*, and *Pilot's Handbook of Aeronautical Knowledge*, pilots are likely unaware that attitude indicators have pitch indication ranges that may be limited to ± 25°.

Information provided by the onboard recorder provided critical information early in the investigation that enabled investigators to make conclusive determinations about what happened during the accident flight and to more precisely focus the safety investigation on the issues that need to be addressed to prevent future accidents.

Probable Cause

The National Transportation Safety Board determines that the probable cause of this accident was the pilot's decision to continue flight under visual flight rules into deteriorating weather conditions, which resulted in the pilot's spatial disorientation and loss of control. Also causal was the Alaska Department of Public Safety's punitive culture and inadequate safety management, which prevented the organization from identifying and correcting latent deficiencies in risk management and pilot training. Contributing to the accident was the pilot's exceptionally high motivation to complete search and rescue missions, which increased his risk tolerance and adversely affected his decision-making.

Recommendations

As a result of this investigation, the NTSB makes 3 safety recommendations to the Federal Aviation Administration and 7 safety recommendations to the State of Alaska, 44 additional states, Puerto Rico, and the District of Columbia that conduct law enforcement public aircraft operations.

To the State of Alaska, 44 additional states, Puerto Rico, and the District of Columbia:

1. Develop and implement a flight risk evaluation program that includes training for all employees involved in the operation and procedures that support the systematic evaluation of flight risks and consultation with others trained in flight operations if the risks reach a predefined level.
2. Use formalized dispatch and flight-following procedures that include up-to-date weather information and assistance with flight risk assessment decisions.
3. Provide all pilots who will perform night vision goggle (NVG) operations with formal NVG ground and flight training and require them to complete this training on an annual basis to remain on flight status.
4. Require all pilots who perform state law enforcement search and rescue missions to receive, on an annual basis, scenario-based inadvertent instrument meteorological conditions simulator training that includes strategies for recognizing, avoiding, and safely escaping the conditions.
5. Create a formal tactical flight officer (TFO) training program that includes training on aeronautical decision-making, crew resource management, and operating aircraft navigational and communications equipment, and use TFOs during search and rescue operations.
6. Develop, and implement a comprehensive safety management system for aircraft operations that (1) holds senior state personnel accountable for the safety of state law enforcement aircraft operations, (2) is tailored to the department's missions, and (3) is based on industry best practices.
7. Arrange for an audit of the safety management system implemented in response to Safety Recommendation [#6] to be conducted every 3 years by an outside organization.
8. To the Federal Aviation Administration:
9. Work with operators, training providers, and industry groups to evaluate the effectiveness of current helicopter inadvertent instrument meteorological conditions training programs and develop and publish best practices for such training.
10. Issue guidance to pilots explaining that attitude indicators have pitch and bank indication limits, that the pitch indicating range is required to be at least± 25°, and that, if an aircraft operates at a pitch that exceeds the indicating limits, the pitch indicator may stop and remain at the limit until the pitch no longer exceeds the limitation, or it may tumble.
11. Revise the *Pilot's Handbook of Aeronautical Knowledge* to clarify the information it contains on attitude indicator pitch and bank limitations to explain that attitude indicators have pitch and bank indication limits, that the pitch indicating range is required to be at least ± 25°, and that, if an aircraft operates at a pitch that exceeds the indicating limits, the pitch indicator may stop and remain at the limit until the pitch no longer exceeds the limitation, or it may tumble.