



## **AS 350BA Strikes Glacier During Alaskan Air Tour**

*Pilots flying two other helicopters in the area said that they had difficulty differentiating between the overcast sky and the snow-covered terrain and that the ceiling was only a few hundred feet higher than the mountain pass.*

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*FSF Editorial Staff*

About 1050 local time June 9, 1999, a Eurocopter AS 350BA helicopter that was being flown on a tour of glaciers north of Juneau, Alaska, U.S., struck a glacier. The helicopter was destroyed, and the pilot and all six passengers were killed.

The U.S. National Transportation Safety Board (NTSB) said in its final report that the probable cause of the accident was the pilot's "continued VFR [visual flight rules] flight into adverse weather, spatial disorientation and failure to maintain aircraft control." The report said that factors contributing to the accident were "pressure by the company to continue flights in marginal weather" and "flat" light conditions, which made the snow-covered terrain difficult to distinguish from the overcast sky. Additional factors were "the pilot's lack of instrument experience, lack of total experience, inadequate certification and approval of the operator by the FAA [U.S. Federal Aviation Administration] and the FAA's inadequate surveillance of the emergency instrument procedures in use by the company."

The morning of the accident, the skid/ski-equipped helicopter, owned and operated by Coastal Helicopters of Juneau, departed from Juneau at 1008 for what was to have been a 50-minute flight over glaciers in mountainous terrain. The helicopter was



landed about 1025 at 1,000 feet on the Herbert Glacier — a routine stop on the glacier tour. Ten minutes later, the helicopter departed to continue the tour.

The pilots of two other air tour helicopters in the area of the Herbert Glacier and the nearby Mendenhall Glacier said that they heard a routine radio transmission from the pilot of the accident helicopter at 1045 in which he said, "Coastal 99S is upper Herbert for the Mendenhall, right side."

At 1055, the pilot of one of the other helicopters saw the wreckage as he flew his helicopter over the Herbert Glacier.

The report said, "Both pilots [of the other helicopters] said the snow-covered glacier was featureless [and] the overcast ceiling was difficult to discern from the snow, and [both pilots] described the lighting as 'flat.' Both pilots said the overcast layer was a few hundred feet above the elevation of the 4,100[-foot] pass between the two glaciers, but neither could discern the exact ceiling."

The helicopter was found inverted in snow at the 3,400-foot level of the Herbert Glacier, which had a 0.5-degree upward slope in the same direction as the helicopter's flight path. The fuselage

and all major components were in a crater 16 feet (five meters) wide, 24 feet (seven meters) long and six feet (two meters) deep. The investigation revealed no pre-impact mechanical anomalies or fuel-system anomalies; the ruptured fuel tank contained about 10 gallons (38 liters) of a clear fluid that appeared to be jet fuel.



### Eurocopter AS 350

The Eurocopter AS 350 is a light five/six-seat utility helicopter, first produced in October 1977 by Aerospatiale as the AS 350B. The AS 350B is powered by a 478-kilowatt (641-shaft-horsepower) Turbomeca Arriel 1B turboshaft engine and a rotor of three fiberglass blades that rotate clockwise as viewed from above. Directional control is effected by a two-blade tail rotor on the right side of the tail boom.

The AS 350BA, also known as the Ecureuil (Squirrel), is an upgraded version of the AS 350B. The AS 350BA is equipped with larger main-rotor blades that originally were developed for the twin-engine AS 355 and has a maximum takeoff weight that is 150 kilograms (331 pounds) higher than the AS 350B.

The Aerospatiale helicopter division and the MBB (Messerschmitt-Bölkow-Blohm) helicopter division merged in 1992 to form Eurocopter.

The AS 350B and AS 350BA have two standard bucket seats at the front of the cabin and two two-place bench seats aft.

The AS 350BA's maximum takeoff weight is 2,100 kilograms (4,630 pounds) or 2,250 kilograms (4,960 pounds) with a maximum sling load. Maximum rate of climb is 1,500 feet per minute. The AS 350BA has a maximum cruise speed at sea level of 126 knots and a service ceiling of 15,750 feet. Hovering ceiling out of ground effect is 6,500 feet. Range with maximum fuel (540 liters [142.6 gallons]) at sea level is 730 kilometers (453 statute miles).♦

Source: *Jane's All the World's Aircraft*

When the accident occurred, the pilot — a citizen of New Zealand — had about 650 flight hours in helicopters; a precise figure was not available, and the report said that when NTSB, FAA and the New Zealand Civil Aviation Authority (CAA) requested the pilot's logbook from his family, "the family responded that the pilot's logbook and all flight records were cremated with his remains."

Of the estimated 650 helicopter flight hours, 487 flight hours could be verified by employer records and flight school records compiled by FAA. The report said that the pilot probably accumulated about 125 additional hours of helicopter flight time during his first job as a flight instructor, but these records were not available.

The pilot did not have an instrument rating; he was not required by FAA to have one.

The pilot had flown microlight aircraft in New Zealand and had received 10 flight hours to 20 flight hours of helicopter training in New Zealand. He received the remainder of his training in the United States, at flight schools in Arizona and California.

"Interviews conducted by the FAA indicated the pilot had difficulty reading and writing English," the report said. "Quantum Helicopters in Chandler, Arizona, provided commercial helicopter flight training to the pilot. Quantum's chief pilot stated that the accident pilot began training for his helicopter flight instructor certificate, but the company terminated his training, citing a failure to meet the standards set forth in [U.S. Federal Aviation Regulations (FARs) Part] 61.183: 'To be eligible for a flight instructor certificate, a person must ... read, write and converse fluently in English.'"

Interviews with other flight school personnel and employers indicated no obvious language difficulties, although the report said that other people interviewed "consistently commented that upon review, none remembered the pilot performing detailed written work in person."

The pilot passed an examination for the flight instructor certificate — administered by an FAA-designated pilot examiner — on Sept. 19, 1998, and began work the next day as a flight instructor for Aero Helicopters of Scottsdale, Arizona. He left that job on Nov. 30, 1998, and from Dec. 1, 1998, until May 8, 1999, he worked as a flight instructor for Guidance Helicopters of Prescott, Arizona.

He was hired on May 8, 1999, by Coastal Helicopters as an air tour pilot and completed initial ground training on May 11, 1999. The same day, he was administered a pilot-in-command proficiency check and line check in a Bell 206B Jet Ranger. The pilot-in-command checks were administered by the president of Coastal Helicopters, who also was the company's director of operations and an FAA-authorized company check airman. The pilot completed pilot-in-command checks in the AS 350 on June 7, 1999.

When he was hired by Coastal Helicopters, the pilot said on his company resume “that he had accrued 891 hours of helicopter flight experience,” the report said. “The NTSB ... and the FAA estimated the pilot actually had 612 helicopter flight hours when hired.”

When he was hired, the pilot had no experience as pilot of a turbine-engine aircraft. While working at Coastal Helicopters, he accumulated 37.5 flight hours, including 5.7 hours of dual flight instruction in the Jet Ranger and 5.7 hours of dual flight instruction in the AS 350. At the time of the accident, his total time in the AS 350 was 7.9 hours, including the 5.7 hours of dual flight instruction.

When the accident occurred, Coastal Helicopters had received four favorable letters about the pilot’s abilities, including one letter from a former employer, but had not received complete information from the pilot’s previous employers in response to requests for employment information, as required by the Pilot Records Improvement Act of 1996. (The law allows helicopter companies involved in on-demand operations to employ a pilot for 90 days while awaiting the information.) The law requires previous employers to provide information about the pilot’s training, qualifications, proficiency or professional competence but not about pilot flight time.

The report said that the accident helicopter was manufactured in 1995 and was configured to carry one pilot and six passengers. The helicopter and the engine had accumulated 1,827 hours in service. Maintenance was performed according to the manufacturer’s inspection program and an approved aircraft inspection program that included inspections approximately every 100 flight hours. The most recent inspection was performed 62 hours before the accident. Maintenance records revealed no pre-existing anomalies.

The accident helicopter was one of six helicopters — two Jet Rangers and four AS 350s — operated by Coastal Helicopters at the time of the accident. The company was authorized to conduct on-demand passenger-carrying operations in day VFR and night VFR conditions. The helicopters were equipped only with “standard” flight instruments, including a gyroscopic rate-of-turn indicator, a slip-skid indicator, a gyroscopic bank-and-pitch indicator and a gyroscopic direction indicator, the report said.

Weather on the morning of the accident — as described by other helicopter pilots who were in the area and as shown in photographs taken by rescue personnel and Alaska state police — included an overcast ceiling that was difficult to distinguish from terrain. Another Coastal Helicopters’ pilot characterized the appearance of the surroundings as “a milky blur.”

The report said that a review of the photographs, which were taken one hour after the accident, showed “the pass between the

Herbert Glacier and the Mendenhall Glacier obscured, with no discernible horizon, when looking at the pass from the accident site. The view looking down the Herbert Glacier from the accident site depicted an overcast ceiling [that] sloped up with the terrain, gradually lowering toward the upper elevations.”

The nearest official weather reporting station was at Juneau International Airport, 20 nautical miles (37 kilometers) south of the accident site, where the elevation was 19 feet. The weather observation at 1053 included scattered clouds at 1,600 feet, an overcast layer at 2,100 feet and visibility of 10 statute miles (16 kilometers). The ceiling was the lowest reported at the Juneau airport for any time period during which the pilot had flown a helicopter since he began his job in Alaska. (Nevertheless, conditions above the glaciers often differ from conditions reported at the airport because of the effects of mountains, wind and temperature variations associated with the large mass of ice.)

Coastal Helicopters’ records showed that the pilot had flown helicopters to and from the Herbert Glacier 31 times before the accident flight and that he had flown from the Herbert Glacier to the Mendenhall Glacier through the Upper Herbert Glacier Pass 11 times.

The company president said that the preferred tour route was to fly north over the Herbert Glacier, across the Upper Herbert Glacier Pass to the Mendenhall Glacier and south over the Mendenhall Glacier to Juneau. He said that a pilot would fly north and south over the Herbert Glacier when low ceilings closed the pass to the Mendenhall Glacier.

The report said that in the days before the accident, the pilot of the accident helicopter had made telephone calls to the owner of a helicopter company in New Zealand and a former employer in Arizona during which he said that he was unhappy with his Alaska job.

On June 2, after returning to Juneau from a tour flight, the pilot of the accident helicopter had telephoned the owner of Garden City Helicopters, the New Zealand company that had provided his initial helicopter flight training, and asked him about job opportunities in New Zealand.

The report said, “The New Zealand [company] owner told [an NTSB investigator] that the pilot was displeased with the environment and pressures to fly in marginal weather. He told the [NTSB investigator] that the pilot was uncomfortable flying a load of tourists in marginal conditions, and so his boss had taken another aircraft and told the pilot to follow him. According to the New Zealand owner, the accident pilot told him ‘he had been in a clear cell following his boss in between [clouds] and surrounded by clouds, unable to land because of terrain.’ The New Zealand owner told the [NTSB investigator] that the accident pilot’s exact words were that ‘he was living on borrowed time.’”

Coastal Helicopters’ president said that he had not flown a tour flight for three days before or after the pilot’s telephone call to

New Zealand but that the chief pilot sometimes flew a helicopter to “lead” a new pilot — flying a second helicopter — along an unfamiliar route. The chief pilot said that he did not remember the incident described by the New Zealand owner.

The owner of Guidance Helicopters in Prescott, Arizona, where the pilot of the accident helicopter had worked as a flight instructor for five months before beginning the Alaska job, said that the pilot called him about June 1. During the telephone call, the pilot “expressed dissatisfaction with the training he had received and also indicated he felt pressured to fly tours in marginal weather.”

The report said that Coastal Helicopters’ new pilot training program approved by FAA was “the minimum” outlined by FAA Order 8400.10, the *Air Transportation Operations Inspector’s Handbook*.

Company training program specifications called for training in seven “special subjects,” including “flight techniques in adverse weather” and “mountain flying — general and specific pass flying,” but the report said that the course-training outline included “no specific mention of white-out [conditions] or flat light conditions caused by overcast clouds over glaciers, or flight techniques over large expanses of snow.” How much training the pilot received in the seven special subjects could not be determined.

FAA Order 8400.10 says that pilots in VFR-only helicopter operations should demonstrate proficiency in recovery from

unusual attitudes, maneuvering while using a partial instrument panel and completion of an instrument approach. Nevertheless, the report said that the FAA principal operations inspector “did not require that any instrument proficiency training or any instrument competency evaluation be included in the company training manual.”

The report said that an NTSB investigator had asked the company’s chief pilot “if he conducted any training for emergency use of basic flight instruments.”

“He replied that he never did and emphasized the company policy was to ‘go down and slow down but never go into instrument conditions,’” the report said. “When asked what he would personally do if he found himself in a white-out or [an] instrument-meteorological-conditions (IMC) situation, he indicated he was not sure because he never intended to be in that situation.”

The company president said that training did not include basic instrument training or emergency instrument training.

The report said, “The company policy was that a pilot just does not fly into instrument conditions.”♦

[FSF editorial note: This article, except where specifically noted, is based on U.S. National Transportation Safety Board factual report and brief-of-accident report no. ANC99FA073. The reports comprise 199 pages and include diagrams, photographs and maps.]

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