



National Transportation Safety Board Aviation Accident Final Report

Location:	Susanville, California	Accident Number:	LAX02FA114
Date & Time:	March 21, 2002, 13:35 Local	Registration:	N1184H
Aircraft:	Eurocopter AS-350B	Aircraft Damage:	Substantial
Defining Event:		Injuries:	1 Fatal, 2 Serious
Flight Conducted Under:	Part 91: General aviation - Positioning		

Analysis

The helicopter collided with the surface of a glassy smooth lake while in cruise flight at low altitude. The purpose of the flight was to reposition the helicopter to the operator's base, after a patient delivery to a regional medical center. The approximate 10-miles in diameter lake is a shallow non-perennial body of water located about 11 miles east of the operators base. The wreckage was located about 2.5 miles from the east shore line and about 3.5 miles from the west shore. The lake is on a normal routing from the hospital to the operator's base. The flight nurse said he was sitting directly behind the pilot in a forward facing seat. He said that usually they crossed the lake about 500 feet above the surface, but this time they were much lower. He estimated that they had descended to within 20 to 50 feet of the lake surface, and, as they flew further out over the water they seemed to get lower and lower. He looked over the pilot's shoulder, and to the right, and noted how glassy smooth the water was. He stated that it was like a mirror and reflected the clouds and the sky perfectly, and was "kind of mesmerizing and disorienting" to see clouds both above and below with no distinct horizon. Just before they hit the water the pilot said on the intercom, "Boy, it's disorienting when the lake is this smooth." The nurse looked out the right side window at the distant shoreline and thought to himself that the flight seemed very, very low. The helicopter then hit the water. The flight nurse and paramedic medical crew members stated that there were no apparent mechanical malfunctions or failures with the helicopter prior to the collision with the lake surface. Examination of the extensively fragmented helicopter disclosed that all control system torque and push/pull tubes, and their associated rod end fittings, were accounted for. Scoring and other rotational evidence was noted on all drive system components.

Probable Cause and Findings

The National Transportation Safety Board determines the probable cause(s) of this accident to be:

Failure of the pilot to maintain sufficient altitude/clearance above the water while performing a low altitude flight. Factors relating to the accident were the glassy water condition, and a lack of visual cues concerning perception of altitude.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER

Phase of Operation: CRUISE

Findings

1. (F) TERRAIN CONDITION - WATER, GLASSY
2. (C) PROPER ALTITUDE - NOT MAINTAINED - PILOT IN COMMAND
3. (C) VISUAL ILLUSION - PILOT IN COMMAND

Factual Information

HISTORY OF FLIGHT

On March 21, 2002, about 1335 Pacific standard time, an Eurocopter AS-350B, N1184H, collided with the surface of Honey Lake, about 11 miles east of Susanville, California. The positioning flight was operated by Mountain Life Flight, Susanville, under 14 CFR Part 91. The airline transport pilot received fatal injuries and the two medical crew members were seriously injured. The helicopter was substantially damaged. Visual meteorological conditions prevailed, and a company flight plan was filed. The flight originated at the Washoe Medical Center about 1300, after dropping off a patient, and was returning to the operator's base at Susanville.

At 1334, the pilot contacted the company dispatcher by radio and estimated the flight's time of arrival as 10 minutes. No further transmissions were received from the pilot.

The flight nurse and paramedic medical crew members reported that the flight back to Susanville seemed routine. The flight nurse said he was sitting directly behind the pilot in a forward facing seat, and was occupied with making notes on the medical records for the patient transport and did not pay much attention to the outside scenery until they were over Honey Lake. He noted that usually they crossed the lake about 500 feet above the surface, but this time they were much lower. He estimated that they had descended to within 20 to 50 feet of the lake surface, and as they flew further out over the water, they seemed to get lower and lower. He looked over the pilot's shoulder, and to the right, and noted how glassy smooth the water was. He stated that it was like a mirror and reflected the clouds and the sky perfectly, and was "kind of mesmerizing and disorienting" to see clouds both above and below. Just before they hit the water the pilot said on the intercom, "Boy, it's disorienting when the lake is this smooth." The nurse looked out the right side window at the distant shoreline and thought to himself that the flight seemed very low. The helicopter then hit the water.

The flight nurse and paramedic medical crew members stated that there were no apparent mechanical malfunctions or failures with the helicopter prior to the collision with the lake surface.

PERSONNEL INFORMATION

The pilot held certificates for commercial, airline transport, and flight instructor, with ratings for single and multiengine land airplanes and helicopters. His pilot certificate was endorsed with instrument ratings for airplanes and helicopters. According to the operator's records, the pilot had accumulated a total flight time of 9,900 hours; with 8,200 helicopter hours, and 600 hours in the accident model. The pilot was a retired Army aviator who had flown both fixed and rotary wing aircraft while in the service.

Review of Federal Aviation Administration (FAA) medical certification records disclosed that the pilot held a second-class medical, which was issued April 24, 2001, with the limitation that the pilot wear corrective lenses. The record sheet for the pilot's last FAA medical examination

noted that his distant and intermediate vision was 20/15 in each eye and his near vision was 20/100 in each eye.

AIRCRAFT INFORMATION

According to the operator's accident report, the helicopter was maintained under a manufacturer's inspection program. The last reported 100-hour inspection occurred 16.8 hours prior to the accident. The helicopter had accrued a total flight time of 8,139 hours.

METEOROLOGICAL INFORMATION

The operator reported the weather as 30 miles visibility; temperature 46 degrees Fahrenheit; wind 110 degrees at 8 knots; altimeter 30.02 inHg; and sky condition 18,000 overcast. The closest aviation weather reporting station is the Reno, Nevada, airport. The observations near the time of the accident were reporting sky 15,000 feet scattered with visibilities greater than 10 miles.

WRECKAGE AND IMPACT INFORMATION

The wreckage was recovered from Honey Lake on March 27, 2002. The approximate 10-miles in diameter lake is a non-perennial body of water located about 11 miles east of the Susanville Airport at an elevation of about 4,100 msl. Search and rescue personnel reported that the wreckage was located about 2.5 miles from the east shore line and about 3.5 miles from the west shore. The lake is on a normal routing from the Washoe Medical Center to the Susanville airport. According to underwater search and rescue personnel, the pilot was located 85 feet forward of the helicopter wreckage. The pilot's seat was found underneath the helicopter. The search and rescue divers opined that the pilot broke the restraint system and went through the front of the helicopter canopy.

Examination of the extensively fragmented helicopter disclosed that all control system torque and push/pull tubes, and their associated rod end fittings, were accounted for. Scoring and other rotational evidence was noted on all drive system components.

MEDICAL AND PATHOLOGICAL INFORMATION

On March 25, 2002, the acting Lassen County Medical Examiner performed an autopsy on the pilot. During the procedure samples were obtained for toxicological analysis by the FAA Civil Aeromedical Institute in Oklahoma City, Oklahoma. The results of the analyses were negative for carbon monoxide, cyanide, and ethanol. The drug scan was positive for Acetaminophen (Tylenol) at 10.546 (ug/ml, ug/g).

HUMAN PERFORMANCE

A human performance study was accomplished by Safety Board personnel. The report includes interviews with the surviving two crew members, the operator, and family members, and is included in the docket for this accident.

As part of the study, the human performance investigators reviewed the Safety Board accident records since May 1982, and found 33 accidents with glassy water cited as a factor. Nine of the accidents involved helicopters, and all cited the pilot's failure to maintain altitude as part of the causal chain. Commonly cited factors also included glassy water conditions, which resulted in a lack of visual cues for the correct perception of altitude.

ADDITIONAL INFORMATION

The Safety Board did not take possession of the wreckage.

Pilot Information

Certificate:	Airline transport; Commercial; Flight instructor	Age:	50, Male
Airplane Rating(s):	Single-engine land; Multi-engine land	Seat Occupied:	Right
Other Aircraft Rating(s):	Helicopter	Restraint Used:	
Instrument Rating(s):	Airplane; Helicopter	Second Pilot Present:	
Instructor Rating(s):	Airplane multi-engine; Airplane single-engine; Helicopter	Toxicology Performed:	Yes
Medical Certification:	Class 2 Valid Medical--w/ waivers/lim	Last FAA Medical Exam:	April 24, 2001
Occupational Pilot:	Yes	Last Flight Review or Equivalent:	May 16, 2001
Flight Time:	9900 hours (Total, all aircraft), 600 hours (Total, this make and model), 7700 hours (Pilot In Command, all aircraft), 80 hours (Last 90 days, all aircraft), 25 hours (Last 30 days, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	Eurocopter	Registration:	N1184H
Model/Series:	AS-350B	Aircraft Category:	Helicopter
Year of Manufacture:		Amateur Built:	
Airworthiness Certificate:	Normal	Serial Number:	1124
Landing Gear Type:	Skid	Seats:	5
Date/Type of Last Inspection:	March 5, 2002 100 hour	Certified Max Gross Wt.:	4520 lbs
Time Since Last Inspection:	17 Hrs	Engines:	1 Turbo shaft
Airframe Total Time:	8139 Hrs	Engine Manufacturer:	Turbomeca
ELT:	Installed, not activated	Engine Model/Series:	Ariel 1B
Registered Owner:		Rated Power:	675 Horsepower
Operator:		Operating Certificate(s) Held:	On-demand air taxi (135)
Operator Does Business As:	Mountain Life Flight	Operator Designator Code:	ML6A

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual (VMC)	Condition of Light:	Day
Observation Facility, Elevation:	RNO,4412 ft msl	Distance from Accident Site:	64 Nautical Miles
Observation Time:	13:56 Local	Direction from Accident Site:	127°
Lowest Cloud Condition:	Scattered / 15000 ft AGL	Visibility	
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	8 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	110°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	30.02 inches Hg	Temperature/Dew Point:	20° C / 6° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Reno, NV (NONE)	Type of Flight Plan Filed:	Company VFR
Destination:	Susanville, CA (SVE)	Type of Clearance:	None
Departure Time:	13:00 Local	Type of Airspace:	Class G

Wreckage and Impact Information

Crew Injuries:	1 Fatal	Aircraft Damage:	Substantial
Passenger Injuries:	2 Serious	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	1 Fatal, 2 Serious	Latitude, Longitude:	40.376945,-120.573059

Administrative Information

Investigator In Charge (IIC):	Petterson, G.
Additional Participating Persons:	Adrian Grieve; Federal Aviation Administration; Reno, NV
Original Publish Date:	April 28, 2004
Note:	
Investigation Docket:	https://data.nts.gov/Docket?ProjectID=54383

The National Transportation Safety Board (NTSB), established in 1967, is an independent federal agency mandated by Congress through the Independent Safety Board Act of 1974 to investigate transportation accidents, determine the probable causes of the accidents, issue safety recommendations, study transportation safety issues, and evaluate the safety effectiveness of government agencies involved in transportation. The NTSB makes public its actions and decisions through accident reports, safety studies, special investigation reports, safety recommendations, and statistical reviews.

The Independent Safety Board Act, as codified at 49 U.S.C. Section 1154(b), precludes the admission into evidence or use of any part of an NTSB report related to an incident or accident in a civil action for damages resulting from a matter mentioned in the report. A factual report that may be admissible under 49 U.S.C. § 1154(b) is available [here](#).