



National Transportation Safety Board Aviation Accident Final Report

Location:	Kodiak, AK	Accident Number:	ANC06LA059
Date & Time:	05/22/2006, 1300 AKD	Registration:	N1543
Aircraft:	de Havilland DHC-2	Aircraft Damage:	Substantial
Defining Event:		Injuries:	3 Serious, 3 Minor

Flight Conducted Under: Part 135: Air Taxi & Commuter - Non-scheduled - Sightseeing

Analysis

The commercial certificated pilot was departing a remote bay with five passengers in an amphibious float-equipped airplane on the return portion of a Title 14, CFR Part 135 sightseeing flight. The pilot began the takeoff run toward the north, with the wind from the north between 15 to 20 knots, and 4 to 6 foot sea swells. When the airplane had climbed to about 10 to 15 feet, the pilot said a windshear was encountered, which pushed the airplane down. The airplane's floats struck a wave, missed about 4 to 5 swells, and then struck another wave, which produced a loud "bang." The company guide, seated in the right front seat, told the pilot that the right float assembly was broken and displaced upward. The airplane cleared a few additional swells, and then collided with the water. Both float assemblies were crushed upward, and the left float began flooding. The guide exited the airplane onto the right float, and made a distress call via a satellite telephone. All occupants donned a life preserver as the airplane began sinking. The pilot said that after about 15 minutes, the rising water level in the airplane necessitated an evacuation, and all occupants exited into the water, and held onto the right float as the airplane rolled left. The airplane remained floating from the right float, and was being moved away from shore by wind and wave action. The pilot said that one passenger was washed away from the float within about 5 minutes, and two more passengers followed shortly thereafter. Within about 5 minutes after entering the water, the pilot said he lost his grip on the float, and does not remember anything further until regaining consciousness in a hospital. He was told by medical staff that he had been severely hypothermic. U.S. Coast Guard aircraft were already airborne on a training mission, and diverted to rescue the occupants. About 1320, a C-130 flew overhead, and began dropping inflatable rafts. The company guide was the only one able to climb into a raft. When the helicopters arrived, they completed the rescue using a hoist and a rescue swimmer. The passengers reported that they also were unable to hold onto the airplane after entering the water, became unconscious, and were severely hypothermic upon reaching a hospital. The airplane was not equipped with a life raft, and was not required to be so equipped.

Probable Cause and Findings

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

The pilot's inadequate evaluation of the weather conditions, and his selection of unsuitable terrain (rough water) for takeoff, which resulted in a collision with ocean swells during takeoff initial climb, and a hard emergency landing and a roll over. Factors contributing to the accident were a windshear, rough water, and buckling of the float assemblies when the airplane struck the waves.

Findings

Occurrence #1: IN FLIGHT COLLISION WITH TERRAIN/WATER
Phase of Operation: TAKEOFF - INITIAL CLIMB

Findings

1. (F) TERRAIN CONDITION - WATER,ROUGH
 2. (C) UNSUITABLE TERRAIN OR TAKEOFF/LANDING/TAXI AREA - SELECTED - PILOT IN COMMAND
 3. (F) WEATHER CONDITION - WINDSHEAR
 4. (C) WEATHER EVALUATION - INADEQUATE - PILOT IN COMMAND
 5. LANDING GEAR,FLOAT ASSEMBLY - BUCKLED
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Occurrence #2: HARD LANDING
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

Findings

6. (F) LANDING GEAR,FLOAT ASSEMBLY - BUCKLED
-

Occurrence #3: ROLL OVER
Phase of Operation: EMERGENCY LANDING AFTER TAKEOFF

Findings

7. MISC EQPT/FURNISHINGS,RAFTS - LACK OF

Factual Information

On May 22, 2006, about 1300 Alaska daylight time, an amphibious float-equipped de Havilland DHC-2 airplane, N1543, sustained substantial damage when it collided with ocean waves during takeoff-initial climb from Hallo Bay, Alaska, about 65 miles west-northwest of Kodiak, Alaska. The airplane, operated as a visual flight rules (VFR) cross-country air tour flight under Title 14, CFR Part 135, by Andrew Airways, Kodiak, subsequently rolled inverted after an emergency landing on the water. The commercial certificated pilot, a company guide, and one passenger, received minor injuries. The remaining three passengers received serious injuries. Visual meteorological conditions prevailed, and company VFR flight following procedures were in effect. The flight originated from Hallo Bay, a remote area of the Alaska Peninsula, and was en route to Kodiak.

During a telephone conversation with the National Transportation Safety Board (NTSB) investigator-in-charge (IIC), on May 24, the director of operations for the operator reported that the accident flight was the return portion of a tour to the Katmai National Park. The tour consisted of a flight from Kodiak, a landing on the water at Hallo Bay, and the passengers going ashore with the company guide for two hours of bear viewing, prior to a return flight to Kodiak.

During a telephone conversation with the NTSB IIC on May 25, the pilot reported that after boarding the passengers for the return flight, he began the takeoff run toward the north, about 30 yards from and parallel to the beach. He said the wind was from the north between 15 to 20 knots, which produced a few white caps on the waves. The airplane climbed to about 10 to 15 feet, when the pilot said a windshear was encountered. He said the wind came from the northwest about 30 knots, which pushed the airplane down and toward the east. The airplane's floats struck a wave, missed about 4 to 5 swells, and then struck another wave, which produced a loud "bang." The company guide, seated in the right front seat, told the pilot that the right float assembly was broken and displaced upward. The airplane cleared a few additional swells, and then settled onto the water. Both float assemblies were crushed upward, and the left float began flooding. The guide exited the airplane onto the right float, and made a distress call via a satellite telephone. All occupants donned a life preserver as the airplane began sinking, left side low. The pilot said that after about 15 minutes, the rising water level in the airplane necessitated an evacuation, and all occupants exited into the water via the right door, and held onto the right float as the airplane rolled left. The pilot said he entered the water about 1320. The airplane remained floating from the right float, and was being moved away from shore by wind and wave action. The pilot said that one passenger was washed away from the float within about 5 minutes, and two more passengers followed shortly thereafter. About 1325, the pilot said he lost his grip on the float, and became unconscious after only about 5 minutes in the water. He said he did not remember anything further until regaining consciousness in a hospital. He said he had minor injuries, but was told by medical staff that he had been severely hypothermic.

One passenger reported that when the airplane landed at Hallo Bay on the flight from Kodiak, the wind conditions were steady, the sea conditions were choppy, with wave heights of about 3 feet. The passenger said the conditions at the time of departure included increased winds, with sea conditions of 4 to 6 feet.

In telephone interviews with the NTSB IIC, several passengers reported their experiences upon

entering the water while waiting for rescue. They were consistent in their reporting of quickly losing the ability to grasp the airplane, becoming unconscious within several minutes, and regaining consciousness after rewarming in the hospital.

Company Information

The operator conducts on-demand commercial flight operations, and in the summer months, provides bear watching air tour flights. The tour includes a 1 hour flight to Hallo Bay, 2 hours of bear watching, and a 1 hour return flight. The operator reported that the single-engine airplane was equipped with a turbine engine and amphibious floats. The airplane had inflatable life preservers that were stored in a pouch under each seat. A briefing about their location was provided when the passengers boarded the airplane. The operator does not demonstrate life preserver-donning technique. The airplane was not equipped with an inflatable raft. Operational control of all flight operations is the responsibility of the director of operations.

Search and Rescue Information

U.S. Coast Guard C-130 airplanes were already airborne on a training mission, and diverted to help rescue the occupants. About 1320, the C-130s flew overhead, and began rescue operations by dropping inflatable rafts. The company guide was the only one able to climb into a raft. One Coast Guard helicopter was on a training mission nearby, and a second helicopter was dispatched from Kodiak to the area. Upon arrival at the accident scene, helicopter crews completed the rescue using rescue hoists and rescue swimmers.

The Coast Guard defines cold water as 59 degrees F or less. According to a chart provided by the Coast Guard, the estimated time to a loss of useful consciousness for a person wearing a life preserver in 59 degree water, but without any protective clothing, is about 90 minutes. In 50 degree water, the chart indicated that a loss of useful consciousness is less than 60 minutes, and in 41 degree water, it is about 30 minutes.

Additional Information

The flight from Kodiak Island to Hallo Bay, located on the east shore of the Alaska Peninsula, crosses the ocean waters of Shelikof Strait in the Gulf of Alaska. The shortest distance across the strait is about 25 miles. Under Title 14, CFR Part 135, Federal Aviation Administration (FAA) regulations permit air taxi operations at a minimum altitude of 500 feet agl. When operated over water, landplanes must be operated at an altitude sufficient to reach the nearest shoreline in the event of an engine failure. There is no such altitude requirement for seaplanes. FAA regulations do not require airplanes operated over-water to have a raft unless it is operated 50 miles, or more, from the nearest shoreline. Life preservers are required for operations over water.

The Safety Board has previously investigated ditching accidents involving seaplanes, landplanes, and helicopters. These investigations have highlighted the unplanned nature of ditchings, and the hazards of egress into the water. In 1999, the Safety Board issued recommendations to the FAA to enhance survivability of passengers of single-engine aircraft that are operated over water. These recommendations would require all occupants of single-engine airplanes, and single-engine helicopters operated for hire (air taxi and air tour) to wear life preservers when the aircraft is operated over water, whether float-equipped or not, unless it is operated at an altitude that allows it to reach a suitable landing area in the case of an engine failure. In addition, the Safety Board asked the FAA to require briefings on ditching

procedures and the use of required flotation equipment for all air taxi and air tour passenger flights that operate over water at an altitude that would not allow them to reach a suitable landing area, including those that operate less than 50 miles from the shoreline.

The FAA responded to these recommendations in 2000, by stating they were issuing a notice of proposed rule making (NPRM) to require passengers on commercial air tour flights operated over water or beyond any shoreline to wear a life preserver, unless the operator could show that the water over which the aircraft operated was not of such size and depth that wearing a life preserver would be required for the survival of its occupants in the event the flight terminated in that water. The FAA has not issued any rulemaking to require air taxi passengers to wear a life preserver in single-engine aircraft when operated over water. As of 2001, the Safety Board had classified the life preserver recommendation to the FAA as "Open-Unacceptable Response," and the briefing requirement is classified as "Open-Acceptable Response." In 2003, the FAA issued a NPRM on National Air Tour Standards, which is still under review.

Pilot Information

Certificate:	Airline Transport; Commercial	Age:	34, Male
Airplane Rating(s):	Multi-engine Land; Single-engine Land; Single-engine Sea	Seat Occupied:	Left
Other Aircraft Rating(s):	None	Restraint Used:	Seatbelt, Shoulder harness
Instrument Rating(s):	Airplane	Second Pilot Present:	No
Instructor Rating(s):	None	Toxicology Performed:	No
Medical Certification:	Class 2 With Waivers/Limitations	Last FAA Medical Exam:	03/01/2006
Occupational Pilot:		Last Flight Review or Equivalent:	05/01/2006
Flight Time:	7460 hours (Total, all aircraft), 40 hours (Total, this make and model), 6814 hours (Pilot In Command, all aircraft), 120 hours (Last 90 days, all aircraft), 50 hours (Last 30 days, all aircraft), 2 hours (Last 24 hours, all aircraft)		

Aircraft and Owner/Operator Information

Aircraft Make:	de Havilland	Registration:	N1543
Model/Series:	DHC-2	Aircraft Category:	Airplane
Year of Manufacture:		Amateur Built:	No
Airworthiness Certificate:	Normal	Serial Number:	1687TB55
Landing Gear Type:	Retractable - Amphibian; Float	Seats:	9
Date/Type of Last Inspection:	05/01/2006, 100 Hour	Certified Max Gross Wt.:	5000 lbs
Time Since Last Inspection:		Engines:	1 Turbo Prop
Airframe Total Time:	16360 Hours as of last inspection	Engine Manufacturer:	Pratt & Whitney Canada
ELT:	Installed, activated, did not aid in locating accident	Engine Model/Series:	PT6-A27
Registered Owner:	Andrew Airways Inc.	Rated Power:	690 hp
Operator:	Andrew Airways Inc.	Operating Certificate(s) Held:	On-demand Air Taxi (135)
Operator Does Business As:		Operator Designator Code:	D4NA

Meteorological Information and Flight Plan

Conditions at Accident Site:	Visual Conditions	Condition of Light:	Day
Observation Facility, Elevation:		Distance from Accident Site:	
Observation Time:		Direction from Accident Site:	
Lowest Cloud Condition:	Clear	Visibility	30 Miles
Lowest Ceiling:	None	Visibility (RVR):	
Wind Speed/Gusts:	20 knots /	Turbulence Type Forecast/Actual:	/
Wind Direction:	360°	Turbulence Severity Forecast/Actual:	/
Altimeter Setting:	29.92 inches Hg	Temperature/Dew Point:	16° C
Precipitation and Obscuration:	No Obscuration; No Precipitation		
Departure Point:	Kodiak, AK	Type of Flight Plan Filed:	Company VFR
Destination:	Kodiak, AK (PADQ)	Type of Clearance:	None
Departure Time:	1300 ADT	Type of Airspace:	

Wreckage and Impact Information

Crew Injuries:	1 Minor	Aircraft Damage:	Substantial
Passenger Injuries:	3 Serious, 2 Minor	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Total Injuries:	3 Serious, 3 Minor	Latitude, Longitude:	58.450000, -154.066667

Administrative Information

Investigator In Charge (IIC): Scott Erickson **Report Date:** 01/31/2007

Additional Participating Persons: Jack Devlin; FAA-AL-ANC FSDO 03; Anchorage, AK

Publish Date:

Investigation Docket: NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at <http://dms.nts.gov/pubdms/>.

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](#).