Transportation Safety Board of Canada

Bureau de la sécurité des transports du Canada

AVIATION INVESTIGATION REPORT
A05C0109

HARD LANDING – AIRCRAFT OVERTURNED

STINSON 108-1 C-FEXL
BURNTWOOD RIVER SEAPLANE BASE
THOMPSON, MANITOBA
18 JUNE 2005

Canada

Aviation Investigation Report

Hard Landing – Aircraft Overturned

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Summary

The float-equipped Stinson 108-1 aircraft (registration C-FEXL, serial number 108-1172) was en route from Rock Lake, Manitoba, to the Burntwood River seaplane base at Thompson, Manitoba, after an overnight fishing trip. The weather for the Thompson area was below limits for day visual flight rules operations, with gusty wind conditions. At approximately 1530 central daylight time, the pilot approached for a downwind landing and landed hard on the water surface. The aircraft bounced on initial impact, rose approximately 30 feet in the air, then nosed over on the second touchdown. The aircraft came to rest inverted and was substantially damaged. The pilot sustained fatal injuries; the passengers attempted to rescue the pilot with no success. The two passengers sustained minor injuries, but were able to exit the overturned aircraft and swim to shore.

Ce rapport est également disponible en français.

Other Factual Information

The pilot and two passengers had departed from Thompson the day before the accident for an overnight fishing trip at the pilot's outpost cabin on Rock Lake, located approximately 20 nautical miles north of Thompson. The occurrence flight departed Rock Lake at approximately 1500 central daylight time[1] for the Burntwood River seaplane base, which lies within the Thompson control zone.

The final approach to landing was in a direction toward the town of Thompson on a heading of about 230°, directly downwind (see Appendix A). Landing downwind increases the speed and, consequently, the impact forces with which the aircraft contacts the landing surface. The approach airspeed was approximately 100 mph, substantially higher than the normal approach speed of 75 mph. On landing, there was no noticeable flare before water contact. After exiting the wreckage, with moderate difficulty, the passengers sat on the overturned floats until the wreckage drifted enough for them to swim ashore. The passengers then walked through the bush until they reached a power line, which they followed into Thompson. It was at that time that emergency services were advised of the accident. There were no other witnesses to the accident. The pilot and front seat passenger were not wearing their available seat belts. The second passenger was in the rear of the cabin, where there was neither a seat nor a restraint system.

The pilot held a Canadian private pilot licence, endorsed for single-engine land and sea operations, with approximately 200 hours of total flight time. A toxicology report issued after the accident did not reveal the presence of any substances that might have impaired the pilot's judgement or ability. A review of the pilot's licence file revealed that he had difficulty passing the required examinations to achieve his private pilot licence. Although qualified, he had fewer than 100 hours on this type of aircraft.

The reported weather at Thompson at the time of the accident was as follows: a few clouds at 400 feet above ground level; ceiling 600 feet broken, 800 feet overcast; visibility 2½ miles in light rain; wind 050° True (T) at 13 knots, gusting to 20 knots; temperature 11°C; dew point 13°C; altimeter setting 29.76; remarks – ceiling ragged. The terminal area forecast, valid from 1400 to 1700, was as follows: wind 040°T at 12 knots; visibility 6 miles in light rain; clouds 400 feet scattered, 1200 feet overcast; from 1400 to 2200 temporarily 3 miles in light rain and fog; ceiling 400 feet broken, 1200 feet overcast. The weather was below the required minimum for visual flight rules (VFR) operations in a control zone.[2] Weather conditions such as these would require that a pilot obtain a special VFR clearance from air traffic control (ATC) before entering the Thompson control zone. The wind at the water base was producing waves two to three feet high.

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1 All times are central daylight time (Coordinated Universal Time minus five hours).

2 Flight visibility – not less than 3 miles. Distance from cloud: horizontally – 1 mile, vertically – 500 feet. Distance above ground level: vertically – 500 feet.

The aircraft was manufactured in 1947. A review of the aircraft's documentation revealed that it was maintained and equipped in accordance with Transport Canada regulations. The aircraft's emergency locater transmitter (ELT) had just been overhauled, but it had not been reinstalled in the aircraft, nor was it required for a trip of this length.

An inspection of the aircraft wreckage revealed the following:

- five of the aircraft float strut fittings were broken by impact forces;
- all of the float struts had failed in overload;
- the right-wing front and rear attachment fittings were broken;
- the dual right-wing strut had failed near the midpoint; and
- the right float bottom was hydraulically deformed and its deck top wrinkled.

The damage to the floats and right-wing strut was consistent with a flat pitch-angle impact with the water surface. No pre-existing conditions were found that would have caused the float attachment fittings to fail.

To ensure adequate separation between aircraft, ATC does not issue special VFR clearances at times when instrument flight rules (IFR) aircraft are scheduled to be in the control zone. At the time of the accident, there was an IFR aircraft operating within the Thompson control zone. The pilot of C-FEXL was aware of the IFR aircraft.

Canadian Aviation Regulations (CARs) require that pilots of all aircraft intending to enter a control zone broadcast their intentions on a specified mandatory frequency (MF). Information gathered during the investigation indicated that the pilot of C-FEXL did not communicate with the Thompson Flight Service Station, or any other aircraft on the MF.

Analysis

Landing with an approach speed of about 100 mph and a tailwind of 23 mph would nearly double the aircraft's normal touchdown speed and greatly increase the impact forces on water contact. The increased impact forces would have been further amplified by the rough water conditions that existed at the time of the accident. The force sustained on this particular landing was enough to cause the float attachment fittings to fail in overload.

The aircraft was being operated without due regard for several regulations and safe practices designed for the safety of the crew, the passengers and other aircraft. The passengers were not safely seated and strapped in; the approach was flown downwind, resulting in a high-speed, hard landing; the weather conditions were below those required for VFR operations in a control zone; the pilot's intentions were not broadcast on the mandatory radio frequency; and ATC and the crew of the IFR aircraft were unaware that C-FEXL was operating within the Thompson control zone.

The absence of witnesses, communication with ATC, and an ELT signal resulted in the accident remaining undetected for nearly three hours.

Findings as to Causes and Contributing Factors

1. The pilot flew the approach at high speed, with a 23 mph tailwind, and landed in rough water, resulting in a hard landing.

2. The impact forces on landing caused the float attachment fittings to fail; the aircraft's floats dug in and the aircraft overturned.

Findings as to Risk

1. The required mandatory frequency broadcasts were not made, creating a risk of collision between C-FEXL and the instrument flight rules aircraft.

2. The aircraft was operated within a control zone in weather conditions that were below allowable limits for such operations.

3. The aircraft was operated within a control zone without the required special visual flight rules clearance from air traffic control (ATC).

4. The pilot and front seat passenger were not wearing the available seat belts, which increased the risk of serious injury.

5. Proper seating and restraints were not provided for the rear passenger.

Other Finding

1. The absence of a functioning emergency locator transmitter on board the aircraft and the aircraft's unknown presence within the Thompson area precluded ATC from alerting emergency services. As a result, emergency personnel did not respond to the accident.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 22 February 2006.

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Appendix A – Route of Flight