

AVIATION INVESTIGATION REPORT

A04P0041

COLLISION WITH WATER

LAKE LA-4-200 BUCCANEER, C-GHJE
FRASER RIVER NEAR RUSKIN, BRITISH COLUMBIA

29 FEBRUARY 2004

The Transportation Safety Board of Canada (TSB) investigated this occurrence for the purpose of advancing transportation safety. It is not the function of the Board to assign fault or determine civil or criminal liability.

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Summary

The Consolidated Aeronautics, Inc. model LA-4-200 Buccaneer (serial number 646, registration C-GHJE) departed Delta Heritage Airpark, British Columbia, at about 1310 Pacific standard time (Coordinated Universal Time minus eight hours) for a local visual flight rules flight. The departure was normal and the engine was running smoothly. Some time later the aircraft conducted a touch-and-go landing on the Fraser River on an easterly heading in Plumper Reach, adjacent to Crescent Island. The aircraft appeared to be descending for another landing when it hit the water in a nose-down, wings-level attitude, with a high vertical speed component.

Boaters arrived at the accident site in less than one minute. However, the aircraft had already sunk and there was a little floating debris. Sections of the aircraft were recovered two days later, and the pilot's body was recovered almost three months later, on 25 May 2004, a few miles downstream from the accident site.

Ce rapport est également disponible en français.

Other Factual Information

The weather in the accident area was good with partial cloud cover at mid to high levels, and the winds were variable in direction at less than 5 knots. The water surface was rippled.

The pilot held a Canadian private pilot licence. His flight medical was current and was last completed on 04 September 2003. His last ECG was dated 07 January 2003. The aircraft journey log recorded 2132.76 hours on the airframe, and it appears that all of the time was flown by the occurrence pilot. The pilot's personal logbook was not found, and his total flight experience is not known.

The occurrence aircraft was an amphibian manufactured in 1974. This type of aircraft is commonly referred to as a "flying boat" because it makes water landings directly on the hull-shaped belly of the fuselage. Each wing was equipped with a sponson (float) to support the wings when the aircraft was taxiing in water.

The wreckage was recovered in three main sections: the instrument panel with the hull beneath the passenger compartment attached; the centre section consisting of the wings and the top part of the fuselage between the passenger compartment and the aft fuselage; and the aft fuselage and empennage with the hull of the centre section. The centre section still had the engine pylon with the engine and propeller attached. Missing sections included the windshield, the top-hinged cabin doors, and the nose section ahead of the instrument panel and containing the nose landing gear.

Examination of the centre wing section and the empennage revealed little leading edge damage other than at the wing root of the left wing (source undetermined) and a dent in the leading edge of the right-hand underwing sponson. Visible exterior flight control damage was limited to the centre hinge on the left wing flap, which was severed and exhibited extensive pre-existing corrosion. The vertical stabilizer and attached rudder were broken near the top. Free movement and continuity of all flight controls was established as far upstream as the severed points of the fuselage.

The elevator push-rod forward end, which was attached to the bottom of the control yoke beneath the instrument panel, was bent and broken off at the threaded rod end bearing assembly. The bearing was not seized and was free to move, although it was badly corroded. The end of the push-rod and the threaded portion of the rod end were missing. After visual examination and consultation with engineers, it was concluded that the fracture of the push rod was due to overload bending, most likely impact-related.

The main landing gear assemblies were examined to determine whether they were extended during an attempted water landing. There was no visible distortion to the assemblies or structure surrounding them, and both gear legs swung freely and accurately in and out of the wheel wells. The wing flap selector was found to be in the up position. This lever mechanically locks in either of its two positions, up or down. There were no signs of damage in the vicinity of the flaps that would have indicated they were down at the time of impact. The aircraft owner's manual requires the wing flaps to be in the down position for all normal take-offs and landings.

Examination of the cabin area resulted in the recovery and subsequent testing and examination by the Transportation Safety Board of Canada (TSB) Engineering Branch of four flight instruments and the pilot's seat belt. The seat belt had torn to destruction, indicating that the pilot had the seat belt fastened at the time of impact and his weight caused the seat belt to fail. The seat belt failure probably allowed the pilot's body to be

ejected from the aircraft.

The latest annual inspection for C-GHJE was recorded on 21 June 2003, about 19 hours of flight time before the accident flight. Documents recovered included a stapled set of pages that comprised the weight and balance (W&B) history for the aircraft. The empty weight being used in the journey log was 1624 pounds. The most recent W&B record was dated 14 February 1986 and indicated that the aircraft empty weight was 1762 pounds. It is known that since this date, changes were made to aircraft equipment, however, there are no corresponding entries in any maintenance records.

The TSB Engineering Branch carried out an examination of the recovered flight instruments and produced Report LP 061/04. Conclusions from the report are as follows:

- 3.1 The engine tachometer was indicating 2300 rpm when impacted.
- 3.2 The turn and slip indicator likely indicated zero rate of yaw when initially impacted. The pointer was captured two needle widths to the left.
- 3.3 The vertical speed indicator is considered to have been indicating its maximum down indication of 2000 feet per minute.
- 3.4 The airspeed indicator did not provide any reliable indication as to its position at the time of impact.

The TSB Engineering Branch also examined the pilot seat belts and produced Report LP 035/04. The following is the conclusion from the report:

One of the lap belts had failed at the stitching, allowing the buckle to depart; there were no signs of pre-existing wear or abrasion. The other belt had started to tear due to overstress but the stitching remained intact. The undamaged end of the un-failed belt was pulled to destruction under laboratory conditions and failed, in the same manner as the failed belt, under a load of 3100 pounds; the requirement is 2250 pounds. Since both belts were the same in every respect, it is considered likely that the failed belt met or exceeded the strength requirement and fractured due to a crash load in excess of the certification requirement. The shoulder belt was not examined in detail.

A post-mortem examination of the pilot's body was carried out by the Forensic Pathology unit at the Royal Columbian Hospital in New Westminster, British Columbia. It was found that the pilot had no injuries that would have been immediately life-threatening. The pattern of injury can be explained by ejection from the cockpit into the water at the time of impact. Evacuation by ejection would not require the pilot to be conscious. The absence of fractures of the hands and forearms indicates that the pilot's hands were likely not on the controls at the time of impact. After consideration of all available information, the coroner attributed the pilot's death to cardiovascular disease, resulting in spontaneous cardiac dysrhythmia and sudden death

while piloting the aircraft. It was noted that individuals with significant narrowing of the arteries that supply the heart may die suddenly, even in the absence of previous symptoms or medical documentation of heart disease.

The Transport Canada publication TP 13312, *Handbook for Medical Examiners*, Cardiovascular: Chapter 1, Comments on Screening, states in part:

The current routine medical examination is intended to ensure that only medically safe aircrew are allowed to fly. This is a shared responsibility with the onus on the applicant to report any symptoms and on the physician to conduct a careful and thorough examination. Screening of the aircrew and air traffic controller population to identify cardiovascular disease before sudden incapacitation is a problematic and controversial undertaking. Nevertheless, a rational policy toward screening can be adopted to provide optimal, though never total, prevention of cardiac incapacitation.

Analysis

Examination of the recovered sections of the aircraft did not reveal any mechanical failures that would be likely to cause a loss of control, although corrosion was noted throughout the aircraft. It would appear that the aircraft had been reconfigured for cruise flight after the touch-and-go landing, in that, at impact, the flaps were retracted and the landing gear was up. The aircraft was not configured for an intentional landing, nor was the engine power reduced to a level consistent with an attempted touchdown.

When all available information is taken into account, it is concluded that pilot incapacitation was the most likely cause for the loss of control and collision with the water.

Finding as to Causes and Contributing Factors

1. It is most likely that the pilot became incapacitated while piloting the aircraft, resulting in a loss of control and collision with the water.

Other Finding

1. Although current pilot medical examinations are intended to ensure that pilots are medically safe to fly, a rational screening policy cannot detect every risk factor that could result in incapacitation.

Safety Action

The Transport Canada Civil Aviation Medicine branch has initiated a project with the TSB to re-examine the accidents with known or suspected cardiac incapacitation during the past 10 years. This occurrence will be added to those to be studied. Following this review, more frequent or extensive testing may be proposed. *This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 05 January 2005.*

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