

AVIATION INVESTIGATION REPORT

A02A0015

COLLISION WITH TREE AND GROUND

COASTAL AVIATION LTD.

CESSNA 172L, C-GFAL

BROOKFIELD, NOVA SCOTIA 10 nm ENE

14 FEBRUARY 2002

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.

## Aviation Investigation Report

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### *Summary*

A Cessna 172L aircraft, serial number 17260159, departed Trenton, Nova Scotia, at 1120 Atlantic standard time on a visual flight rules flight to conduct a natural gas pipeline patrol. The aircraft was flying along the Halifax lateral portion of the patrol when, at approximately 1445, it struck a tree and crashed to the ground. The aircraft wreckage was located by snowmobilers at 1615 alongside the pipeline, approximately 31 miles northeast of Halifax International Airport. The pilot, who was the sole occupant, was fatally injured and the aircraft was destroyed.

*Ce rapport est également disponible en français.*

## *Other Factual Information*

The pilot had flown from Trenton to Port Hawkesbury, Nova Scotia, to start the patrol and was on the fifth leg, the Halifax lateral portion of the patrol, from the Tufts Cove power generating station in Dartmouth to the junction of the main pipeline near New Glasgow. Radar data showed that the transit leg to Port Hawkesbury was flown at approximately 4600 feet above sea level (asl) with a ground speed of 120 knots. The highest obstacle in this area was approximately 1600 feet asl. On reaching the start of the Halifax lateral portion of the patrol, the aircraft descended to between 400 and 550 feet above ground level (agl)<sup>1</sup> and remained at that altitude until just south of Halifax International Airport. The pilot was in contact with Halifax tower as he transited the Halifax control zone; all communications were normal. While transiting the control zone, the aircraft descended further and the remainder of the flight that was captured on radar was flown at altitudes between 150 and 450 feet agl, with the majority at altitudes between 150 and 250 feet agl. At one point, approximately seven nautical miles (nm) NE of the airport, the aircraft disappeared briefly from radar. Throughout this portion of the flight the aircraft closely followed the pipeline track and terrain contours. The last radar return from the aircraft was when it was 19 nm NE of the airport at an altitude of between 350 and 450 feet agl, approximately 14 minutes prior to the accident.

The Nova Scotia portion of the pipeline aerial patrols had been contracted to Coastal Aviation Ltd. by Maritimes & Northeast Pipeline. The contract called for weekly aerial patrols at an altitude of about 1000 feet agl, or lower at the pilot's discretion. The pilots who flew the patrols were trained to report erosion, damaged or missing signs or fences, open gates, and all activity by trucks, logging equipment, and all-terrain-vehicles. The aircraft operator reported that the patrols were normally flown at an altitude of 500 feet agl. It is common practice within the industry to fly between 500 and 700 feet agl.

The Halifax International Airport weather at the time of the occurrence was reported as follows: winds 310° at 7 knots, visibility 15 statute miles, sky clear, temperature minus 7°C, dewpoint minus 18°C.

The accident site was in a snow-covered, clear-cut area on the east side of the pipeline, just beyond a small grove of trees. The clear-cut area extends approximately one mile back along the flight path before reaching a large uncut area of trees. The terrain is gently up-sloping from the uncut area of trees to beyond the accident site. The right wing, right wing strut, and right main landing gear tire struck the top portion of a spruce tree that was sticking up above all other trees and broke it off at approximately 55 feet agl, even with the tops of other trees. The impact with the tree caused the right wing to separate from the aircraft. The aircraft then rolled inverted and travelled 547 feet before striking the ground in an 80-degree nose-down, inverted attitude. After impact with the ground, the aircraft flipped over and came to rest in an upright attitude, facing the opposite direction of flight. The tree impact damage on the right wing, right wing strut, and right main landing gear corresponds to a wings-level attitude at initial impact.

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<sup>1</sup> Altitudes taken from radar sources are in 100 foot increments; consequently, the aircraft could be as much as 50 feet above or below the indicated radar altitude (eg: indicated altitude 500 feet - actual aircraft altitude is between 450 and 550 feet).

Examination of the wreckage confirmed flight control system continuity at impact. No pre-impact discrepancies were found that would have affected operation of the aircraft. Although the aircraft fuel system was compromised during the accident, traces of fuel were found in the fuel tanks, fuel lines, and gascolator, and there was a strong odour of fuel at the accident site. A fuel sample, drawn from the gascolator, was free of contamination. Damage to the propeller was consistent with power being produced by the engine at the time of impact. An examination of the engine tachometer at the TSB Engineering Branch showed an indicated engine rpm at impact of 2350, consistent with a cruise power setting. The engine exhaust system was examined and pre-impact system integrity was confirmed. The interior of the exhaust stacks and muffler had light tan-coloured deposits, typically found when an engine has been operating normally. The aircraft was equipped with an emergency locator transmitter; however, this unit was extensively damaged by impact forces and was unable to transmit a signal.

The pilot obtained his commercial pilot license in July 2001 and started working for Coastal Aviation Ltd. in October 2001. The accident flight was his 12<sup>th</sup> pipeline patrol since his pipeline patrol checkout on 03 December 2001. He had a total of 361 hours total flying time, of which 336 hours were in Cessna 172 aircraft. The pilot was qualified for the flight.

Autopsy results did not reveal any pre-existing medical condition that would have contributed to the accident, and toxicology tests for alcohol and drugs were negative. Blood analysis identified the presence of a low level of carbon monoxide (10% saturation). This level is deemed not to have an adverse effect on performance.

## *Analysis*

The aircraft was operating normally prior to impact and is not considered to be a factor in the accident. Also, there was no pre-existing physiological condition found that might have impaired the pilot's performance.

Radar data showed that the aircraft was flown along terrain contours at altitudes well below that required for effective observation. The aircraft was flown consistently below 500 feet agl, and recorded on radar as low as 150 to 250 feet agl. When the aircraft struck the tree, it would have been only 55 to 60 feet above the ground.

The aircraft was in a wings-level attitude when it struck the tree. This tree was sticking up above the others, but may have blended in with trees in the background. This could explain why the pilot did not see the tree and take evasive action to avoid it, or his attention may have been focussed on observing the pipeline to his left.

The following Engineering Branch report was completed:

LP 012/02 - Instrument Examination

## *Findings as to Causes and Contributing Factors*

1. On this flight, the pilot consistently flew the aircraft below the required altitude for effective observation and inadvertently struck a tree.

*This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 04 December 2002.*

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