

AVIATION OCCURRENCE REPORT

COLLISION WITH TERRAIN IN ADVERSE WEATHER

**CESSNA 310Q C-FAKW
CALEDON, ONTARIO 2 mi W
28 JULY 1995**

REPORT NUMBER A95O0150

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 pilot was on a visual flight rules (VFR) flight from Lindsay, Ontario, to the Kitchener/Waterloo regional airport. At 0725 eastern daylight time (EDT), the pilot requested and obtained radar flight following from the Toronto area control centre. The aircraft was radar identified 30 miles north of Toronto at 4,500 feet above sea level (asl), on a direct track to Kitchener. The pilot then contacted Kitchener/Waterloo control tower and reported being over the Orangeville area. The tower controller told the pilot that the weather was below VFR limits with an estimated broken cloud ceiling of 4,000 feet above ground level, and two and half miles visibility in fog. The controller approved special VFR (SVFR) for the aircraft to land at the airport; however, the approval was subsequently cancelled when the pilot did not respond to further queries from the controller. About 10 minutes after initial radar contact, the area controller observed the radar target descend from a cruising level of 4,500 feet asl to about 1,800 feet where the target went into coast. The target was re-acquired at 1,500 feet, climbed to 1,800 feet, then went into coast again. This time the target remained in coast mode. The pilot did not respond to further radio calls, an emergency locator transmitter (ELT) was heard by an aircraft in flight, and the noise of an aircraft followed by the sound of a crash was heard by persons on the ground. The aircraft had crashed, and the wreckage was found within 20 minutes of the aircraft disappearing from radar.

The aircraft had struck trees in rising terrain, at an elevation of about 1,150 feet asl, and came to rest in a canola field. There were low stratus cloud ceilings and heavy fog in the area of the occurrence. The pilot, who was the sole occupant, was not wearing a shoulder harness and was fatally injured in the accident.

Ce rapport est également disponible en français.

Other Factual Information

Based on the pilot's initiative, the company management had recently agreed that it would be both economical and convenient to have the pilot rent and fly an aircraft, rather than chartering an aircraft for business-related travel. As a result of these discussions, the company had paid for the pilot's recurrent training on the Cessna 310 aircraft. This was the first flight for the company under this arrangement. The plan was to fly from Lindsay to Kitchener, where the pilot would pick up one passenger, proceed to Manitoulin Island to conduct company business, and return to Lindsay.

The pilot had been a licensed pilot since 1971. He obtained his first instrument rating in 1976, and a class III instructor rating in 1978. The pilot was active in aviation as a flight instructor and a charter pilot, and accumulated about 1,542 flying hours from 1976 to 1979. By 1979, the pilot had 11 hours of instrument flying, 53 hours of simulated instrument flying, and 32 hours in a training simulator. In the 15-year period between 1980 and 1995, the pilot had flown an additional 55.2 hours. In the three months preceding the accident, the pilot had flown nine hours, including one hour of instrument flying in a Cessna 310 aircraft, and 2.2 hours in a Link simulator.

In June 1991, the pilot consulted his family physician after experiencing dizziness, visual disturbance, and numbness in his left hand, nose, and upper lip, followed by a headache. An electroencephalogram (EEG) was performed on 19 June 1991, and the results were normal. On 22 October 1991, a consultation was made with a neurologist, who diagnosed the condition as a migraine. On 30 November 1991, the family physician noted that the pilot experienced a further episode of visual disturbance, right hand numbness, and headache. The diagnosis of this episode was also migraine. There is no further evidence of headaches between November 1991 and 28 July 1995. This medical condition could result in a sudden decrement in performance or in complete incapacitation. The pilot did not disclose this medical information on any of his aviation medical examinations. If this information had been reported during his aviation medical examination, it likely would have resulted in his pilot privileges being revoked. Whether the pilot was suffering from a migraine headache or any of the associated symptoms at the time of the accident was not known.

The aircraft was a twin-engine Cessna 310. There was no evidence of any aircraft failure or malfunctions prior to the collision with the trees and ground. Analysis of the recorded radar information shows that the aircraft descended from level flight at 4,500 feet asl to 1,500 feet asl in about 1 minute 45 seconds, about 1,700 feet per minute. The rate of descent was fairly constant throughout.

Recent changes to the Air Navigation Orders (ANO Series II, No. 2/CRCc.-28, *Order Respecting Aircraft Seats and Safety-Belts*) required commercial aircraft to be outfitted with shoulder harnesses for the front-seat occupants. The aircraft owner had applied for,

and been given, a temporary exemption to the requirement. When the aircraft was examined, shoulder harnesses were installed in the aircraft. The log-book entries regarding the installation were not certified in an approved manner. The shoulder harness was a fixed type, not an inertial reel type. If the fixed type shoulder harness was used and properly adjusted across his chest, the pilot could not lean forward and reach various switches and items in the cockpit without first loosening the shoulder harness.

On the day of the accident, a weak frontal trough was situated between Muskoka and Kingston by 0700 EDT. The air mass over the region was very moist, and after 0600 EDT, fog and low cloud began to form. The moist south to southeasterly upslope flow resulted in low stratus cloud ceilings from the surface to 500 feet above ground level (agl), and visibilities of one half mile or less in the vicinity of the accident site.

Before departing from Lindsay, the pilot phoned the Sault Ste. Marie Flight Service Station and received a weather briefing. The briefing included thunderstorm and turbulence warnings in the Georgian Bay area, and warnings of reduced visibilities in fog for southern Ontario. Clear weather conditions were forecast for the central Ontario regions, including Lindsay. As part of the briefing, the pilot was told that visibility in Kitchener was three miles in fog, and that London had two and a quarter miles in fog. The reported cloud conditions were 9,000 feet scattered in Kitchener and 11,000 feet broken in London.

Analysis

The pilot's rationale in electing to continue into deteriorating weather conditions and descend into rising terrain could not be determined with any degree of certainty. However, there are several factors which may have created a stressful environment and contributed to his decision. The pilot, having flown only 55.2 hours in the last 15 years and only 9 hours in the 90 days preceding the accident, although qualified, had very limited recent flight experience. Further, this was the pilot's inaugural business flight, and he had a passenger waiting for him in Kitchener and meetings scheduled later in the day in Manitoulin Island. The better weather conditions at Kitchener as compared to en route may have influenced his decision to descend. Lastly, although there was no evidence of this from the recorded radio transmissions or radar information, the possibility of a migraine adversely affecting the pilot's performance during the flight cannot be eliminated.

When the pilot departed from Lindsay, the sky was clear, but he was aware that he would be encountering low cloud and reduced visibility in the Kitchener area, as well as possible thunderstorms in the vicinity of Manitoulin Island. En route to Kitchener, the pilot encountered weather that was worse than forecast. The constant, seemingly controlled descent from 4,500 feet until very near the ground indicates that the aircraft was under the control of the pilot. This controlled descent, in

conjunction with the low ceilings and visibility reported and forecast, would indicate that the pilot was descending with the intention of maintaining visual contact with the ground or, more probably, breaking out of the cloud. Unfortunately, the pilot descended in an area of rising terrain and, prior to establishing adequate visual contact with the terrain, struck the trees and ground. As the pilot descended, he did contact the Kitchener/Waterloo control tower and was given SVFR to enter the control zone. As it turned out, the weather conditions at the Kitchener/Waterloo airport, although not suitable for VFR, were considerably better than the weather conditions that the pilot encountered en route and during his descent. It was likely that the pilot assumed the weather conditions he was operating in were similar to the reported weather conditions at Kitchener, and that by descending he would be able to maintain or regain visual contact with the ground.

The aircraft had been fitted with a shoulder harness modification to the existing lap belts, but the pilot was not wearing the shoulder harness when the aircraft struck the trees; this may have been related to the inconvenience of the fixed type installation. The use of the shoulder harness likely would have reduced the severity of the upper torso injuries to the pilot.

The following Engineering Branch report was completed:
LP 111/95 - Instrument Examination.

Findings

1. The pilot, in an attempt to maintain or regain visual contact with the ground, descended in low cloud and heavy fog into rising terrain, and the aircraft struck the ground.
2. The aircraft was serviceable, although the pilot shoulder harness installation was not certified.
3. The pilot was not wearing the available shoulder harness.
4. The pilot did not fully disclose his medical condition on his aviation medical assessments.

Causes and Contributing Factors

The pilot encountered weather conditions that were worse than forecast, and, in an attempt to maintain or regain visual contact with the ground in an area of low cloud and dense ground fog, he descended and the aircraft struck the ground. Contributing to the pilot's decision to continue the flight into known adverse weather conditions may have been his lack of currency, the waiting passenger, and the better weather conditions reported at Kitchener.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson Benoît Bouchard, and members Maurice Harquail and W.A. Tadros, authorized the release of this report on 25 July 1996.