

AVIATION INVESTIGATION REPORT

A01W0073

CONTROLLED FLIGHT INTO TERRAIN

CESSNA 210F N5812F

TESLIN, YUKON

30 MARCH 2001

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*

The Cessna 210F, N5812F, en route from Kansas to Alaska, United States, departed the Fort Nelson airport, British Columbia, at 1724 Pacific standard time on a visual flight rules flight to Whitehorse, Yukon. When the aircraft failed to arrive at Whitehorse, search activities were initiated. There was no emergency locator transmitter signal, and the wreckage was not found until the next morning at about 0800. The aircraft crashed at an estimated time of 1935 on the frozen, snow-covered surface of Teslin Lake approximately four statute miles west of Teslin, Yukon, where the highway follows the lakeshore; there is steeply rising terrain immediately to the north. The pilot, the lone occupant, did not survive.

*Ce rapport est également disponible en français.*

## *Other Factual Information*

The pilot was certified and qualified for the flight in accordance with existing regulations. He had held a United States Federal Aviation Administration private pilot licence since 1995; his Class 3 medical certificate was valid until 01 September 2001. A Biennial Flight Review was recently completed. His total flying time was approximately 450 hours, with about 25 hours on type. According to the pilot's log book, much of the flying time was logged in Alaska, in a variety of weather, terrain, and seasonal conditions, and he had flown the route from Alaska to Kansas on several occasions. Records indicate that he had little or no instrument flying training or experience and was not instrument flight rules-rated.

The pilot had recently purchased the Cessna 210F in Kansas. After completing five hours of training and a checkout on the aircraft in Kansas on 29 March 2001, he began the ferry of the aircraft to his home in Alaska. On March 30 the pilot departed from Billings, Montana, United States, and cleared customs in Lethbridge, Alberta. Fuel stops were made in Fort St. John and Fort Nelson, British Columbia. In his final radio contact with the Fort Nelson Flight Service Station (FSS) the pilot was estimating arrival in Whitehorse at 2004 Pacific standard time (PST).<sup>1</sup>

A special aviation weather observation was made at Teslin at 1615 on March 30, with the weather reported as follows:

Wind 140° at 13 knots; visibility 5 statute miles (sm) in light snow; clouds scattered at 3600 above ground level (agl) and overcast at 11 000 agl.

The routine aviation weather report for Teslin for 1700 was as follows:

Wind 120° magnetic (M) at 8 knots; visibility 10 sm in light snow; clouds few at 2200 feet agl, scattered at 3600 agl, and overcast at 11 000 agl; temperature -1°C; dew point -4°C; and altimeter 29.58. Associated remarks included cloud types strato-fractus two-eighths cover, strato-cumulus two-eighths cover, alto-stratus five-eighths cover.

The Teslin terminal aviation forecast valid from 1500 called for:

Winds from 120°M at 5 knots; visibility 6 sm in light snow; overcast cloud at 3000 agl; temporarily from 1500 to 1700, visibility 2 sm in light snow, vertical visibility 1500 agl.

The area forecast for the route flown presented by the Graphic Area Forecast, valid from 1700, called for:

Broken cloud layers 6000 to 8000 feet agl, topped at 22 000 feet, with visibilities 4 sm in light snow in a few areas; and local ceilings 2000 feet agl.

Sunset on March 30 for the accident location was 1922, with the end of civil twilight at 1952.

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<sup>1</sup> All times are PST (Coordinated Universal Time minus eight hours) unless otherwise noted.

The pilot obtained a full weather briefing while in Lethbridge. At Fort St. John he did not receive a full weather briefing at the FSS, indicating that he was satisfied with an abbreviated update briefing. He did not request weather information during the stop at Fort Nelson. In a radio communication at 1844 with Whitehorse FSS through the Watson Lake, Yukon, remote communications outlet, the pilot reported that he was abeam Watson Lake and following the highway. He was informed that there was an observed area of heavy snow showers along his route in which conditions appeared to be below visual flight conditions.

At approximately 1930 a low-flying aircraft was heard travelling in a westerly direction at Teslin and at Fox Point, Yukon, two nautical miles to the west. Observed visibilities were about one-quarter statute mile or less in snow.

The aircraft, while in a left turn, struck the lake surface approximately 2700 feet from the shore. Aircraft attitude at the time of impact was nose-low, banked slightly to the left, with a calculated speed of about 170 knots. The wreckage trail was 880 feet long on a heading of 160°M. Highway orientation at that point is about 260°M, and the lake about 2.3 statute miles wide.

The aircraft tumbled and broke up when it struck the lake. Examination of the aircraft carried out at the accident site did not reveal any pre-impact failure or malfunction. At the time of impact the flaps and landing gear were retracted, and the engine was developing considerable power. The pilot's seat and seat-belt attachments had broken away from the floor structure. Shoulder harnesses were not installed. The weight and centre of gravity were within prescribed limits, and the aircraft was carrying sufficient fuel to complete the flight. The aircraft was fully fitted with standard navigation equipment including a global positioning system (GPS). Documentation indicates that the aircraft was properly certified, equipped, and maintained in accordance with existing regulations and approved procedures.

The Sharc emergency locator transmitter (ELT), serial number 128003, had a battery pack expiry date of February 2001. The control switch on the unit featured three positions: ON, ARM, and OFF. It was found in the OFF position. Automatic operation of the ELT gravity switch under crash forces requires the switch to be in the ARM position. All components and connections, including the external antennae, were intact and the ELT operated as specified during testing. Survival equipment, consisting of a tent, candle, signal mirror, fire starter sticks, coveralls, a first-aid kit and a satellite telephone, was located in the cabin. None of this equipment had been accessed by the pilot after the accident.

Based on autopsy, toxicological, and medical records, there was nothing to indicate that the pilot's performance was degraded by physiological or physical factors. The pilot did not suffer immediate life-threatening injuries during the crash; however, head and back injuries reduced his mobility. He had crawled a distance of about 100 feet around the wreckage. Autopsy results indicate that the pilot most likely succumbed to blood loss and hypothermia.

The Transport Canada *Aeronautical Information Publication* (AIP) defines whiteout as an atmospheric optical phenomenon in which the observer appears to be engulfed in a uniformly white glow, where sense of depth and orientation is lost. Whiteout occurs over an unbroken snow cover and beneath a uniformly overcast sky or falling snow, resulting in evenly diffused light. The AIP recommends that pilots avoid such conditions unless they have the suitable instruments, and are sufficiently experienced. For a pilot to escape from whiteout conditions, it is necessary to either effectively transition from visual to instrument flight or be able to quickly regain sight of visual contrast. If at low level, a climb or a turn toward an area where sharp terrain features can

be seen should be initiated. It is generally considered to be a difficult task for even an experienced instrument pilot to make a successful transition from visual to instrument flight after inadvertent entry into instrument conditions.

## *Analysis*

Based on the aircraft's take-off time from Fort Nelson, the time abeam Watson Lake, and the distances flown, it is believed that the low-flying aircraft heard at 1930 was the accident aircraft. The pilot was likely flying at low altitude to maintain visual ground reference in falling snow, and perhaps had turned left over the snow-covered surface of Teslin Lake in an attempt to leave the area of snow. With reported ground visibilities of one-quarter statute mile or less, and in the diminished light at sunset, the pilot would have been faced with whiteout conditions, and would have lost the ability to orient his aircraft by visual reference with the surface of the lake. With no visual altitude reference the aircraft probably struck the frozen, snow-covered lake before the pilot realized his proximity to the surface.

Deceleration forces during the crash would almost certainly have resulted in activation of the ELT gravity switch; however, no post-crash ELT signal was transmitted because the control switch was in the OFF position. Since the ELT functioned normally during testing, it is probable that the unit was capable of transmitting a signal at the time of the accident.

## *Findings as to Causes and Contributing Factors*

1. The pilot continued flight into adverse weather conditions.
2. The aircraft contacted the surface of the lake, most likely because the pilot lost visual reference in whiteout conditions.

## *Findings as to Risk*

1. The ELT was switched OFF and the lack of an ELT signal delayed discovery of the wreckage.
2. The delay in locating the wreckage probably resulted in the pilot's succumbing to blood loss and hypothermia.

*This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 19 December 2001.*