

AVIATION INVESTIGATION REPORT

A00W0217

COLLISION WITH TERRAIN

SUMMIT AIR CHARTERS LTD.

SHORT BROTHERS SC-7 SKYVAN C-FSDZ

PORT RADIUM, NORTHWEST TERRITORIES

08 OCTOBER 2000

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

At 1108 mountain daylight time on 08 October 2000, the Summit Air Charter's Short Brothers SC-7 Skyvan, serial number SH1953, departed on a visual flight rules six-hour flight from Yellowknife, Northwest Territories, to Kugluktuk, Nunavut, to Port Radium, Northwest Territories, and back to Yellowknife. The flight plan indicated a one-hour stop in Kugluktuk, with an estimated time of arrival at Yellowknife of 1710. The pilot-in-command was the chief pilot of Summit Air Charters Ltd. A cargo handler, who was also a pilot, was in the co-pilot's seat, and there was one passenger.

When the aircraft failed to arrive at Yellowknife, Search and Rescue (SAR) were alerted and a search was begun. At 2202 SAR personnel confirmed that the SAR satellite was picking up an emergency locator transmitter signal in the vicinity of Port Radium. SAR aircraft were directed to the signal location and found the signal source but were not able to see the wreckage because of fog and freezing rain. The wreckage was found at 1309 the following day. The aircraft had struck the top of steeply rising hills along the east shore of Great Bear Lake, approximately 2.9 nautical miles northeast of the Port Radium airstrip. The crash site is approximately 440 feet above the lake surface and 250 feet above the airstrip elevation (see Appendix A). The aircraft was destroyed, and the three persons on board were fatally injured.

Ce rapport est également disponible en français.

Other Factual Information

The flight was chartered by a local engineering company to transport equipment to Kugluktuk and return with empty fuel barrels. On the return trip, the pilot was to overfly and inspect the abandoned airstrip at Port Radium on Great Bear Lake, from which he planned to operate in the next few days. After an inspection of the runway, the pilot was to continue on to Yellowknife.

The pilot received a weather briefing from the Yellowknife Flight Service Station (FSS) at approximately 0808. The weather synopsis for the area and time of intended flight was for generally visual flight rules (VFR) conditions, with the exception of low ceilings and visibilities in the vicinity of the warm front along the Arctic coast. Also forecast were 800-foot ceilings along the cold front extending west to east through the centre of Great Bear Lake (and Port Radium) during the intended period of flight. The freezing level was reported to be at the surface north of Great Bear Lake and at 2500 feet above sea level (asl) south of the lake. Light rime icing was forecast below 16 000 feet asl and at altitudes above the freezing level while in cloud.

The flight arrived in Kugluktuk at 1318 mountain daylight time¹, unloaded the cargo, loaded the empty fuel barrels, and refuelled. The flight departed Kugluktuk at 1424 for Port Radium. Although the exact time of the occurrence is unknown, the aircraft clock had stopped at 1520, which is consistent with the length of time it would normally take the Skyvan to travel that distance. The track between Kugluktuk and Port Radium is approximately 178 degrees magnetic, as was the orientation of the wreckage trail. The aircraft's global positioning system (GPS) receiver was recovered for data analysis and recorded a track of 176 degrees magnetic from the last position to the destination waypoint, approximately one nautical mile west of the Port Radium airstrip.

The hills along the shoreline in the area of the crash comprise mainly rock, sparsely covered with coniferous trees measuring 8 to 12 inches in diameter and 30 feet in height. The elevations of the hills varied from 500 to 900 feet above the surface of the lake (1000 to 1400 feet asl).²

The aircraft initially hit the treetops in a wings-level attitude, with the pitch attitude about neutral. The cockpit area was compromised as portions of the wings were shed from the aircraft from tree contact until the fuselage made firm contact with up-sloping rocky terrain. As the aircraft bounced and tumbled up the 12-degree slope, all occupants were ejected from the aircraft. The aircraft came to rest at the top of a steep slope of snow and ice, inverted, pointing back down the wreckage trail, approximately 500 feet from the first impact marks on the trees. Any examination of the interior components was precluded because of the precarious position of the wreckage. Empty barrels could be seen in the rear of the aircraft.

The forward fuselage and flight deck were destroyed, with instruments and controls strewn along the wreckage trail. The aircraft had two altimeters; the face of one was found and revealed an altimeter setting of 29.38 inches of mercury, the setting for Kugluktuk at departure. The radio altimeter was found mostly intact, with the needle indicating 55 to 60 feet and the bug set at about 600 feet. Both wing outboard panels were broken away, as was the right-hand landing gear and pylon assembly. Both engines and propellers were attached in position on the wings, with all propeller blades twisted and bent aft. The flaps were in the retracted position.

¹ All times are mountain daylight time (Coordinated Universal Time minus six hours).

² Units are consistent with official manuals, documents, and instructions used by or issued to the crew.

The *Canadian Aviation Regulations* did not require this aircraft to be equipped with a cockpit voice recorder or a flight data recorder, and neither was installed. The aircraft was certified to be flown with one pilot when operated under 12 500 pounds gross take-off weight and in VFR conditions. These parameters were met when the aircraft departed from Kugluktuk, with the aircraft weight about 11 100 pounds at the time of the accident.

The aircraft was equipped with flight instruments for instrument flight rules (IFR) flight, but did not have an autopilot. The installed GPS receiver was certified for VFR flight only.

The pilot had a valid medical certificate, a commercial pilot licence, a multi-engine instrument rating, and a current pilot proficiency check on the Skyvan. He had spent approximately 26 years in the aviation business, with over 22 000 hours of flight experience, of which 1000 hours was on the Skyvan. Most of his experience was in the northern and Arctic regions of Canada, and he was familiar with the route of the intended flight.

In the 90 days before the accident, the pilot had accumulated 375 flight hours, with 156 hours in the 30 days before the accident. The *Canadian Aviation Regulations* limit the 30-day flight time to 120 hours; however, the company had obtained an increase to 150 hours in accordance with Commercial Air Service Standard 720.15.

The company employee in the co-pilot's seat was hired as a cargo handler. He was also a pilot, who possessed a valid medical certificate, commercial pilot licence, and multi-engine and instrument ratings, but he had not completed a pilot proficiency check on the Skyvan. He had graduated recently from an aviation college program and had a total time of approximately 280 flight hours, with about 100 additional flight hours in the co-pilot's position in the Skyvan. This flight was his first in about 30 days because he had been on leave.

Analysis

The length of the wreckage trail, the tree-strike evidence, and the flap position are consistent with the aircraft being in cruise configuration and at cruise airspeed at impact, characteristics of controlled flight into terrain. Damage to the engines and the propellers is consistent with both engines producing power when the propellers contacted the terrain.

The similarities between the magnetic track of the wreckage trail and the GPS recorded track indicate that, at the time of the occurrence, the aircraft was most likely on course to the selected waypoint, which was near the runway at Port Radium.

Forecast weather and weather reported by the search-and-rescue aircraft several hours after the accident support the conclusion that the pilot encountered low visibility during the approach into the Port Radium area. It is probable that the aircraft encountered icing in cloud, but it is not known what effect this had on the flight. Ice could have resulted in an unwanted descent and could have obscured the windscreen such that the pilot had limited forward visibility. Regardless of the ice, the low visibility most likely precluded the pilot from seeing the hills that were along the flight path. Given that the pilot was using the GPS for navigation and probably knew where he was in relation to the airstrip, it could not be determined why the pilot descended below the terrain elevation in that area.

Findings as to Causes and Contributing Factors

1. Although the pilot and the aircraft were certified for instrument flight, the pilot apparently continued to fly in accordance with visual flight rules after encountering marginal weather conditions and reduced visibility.
2. For undetermined reasons, the pilot descended below the elevation of the terrain surrounding the airstrip, resulting in a controlled-flight-into-terrain accident.

Finding as to Risk

1. Given the pilot's flying time during the 30 days before the accident, the pilot's performance might have been affected by fatigue.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 27 November 2001.

Appendix A—Map of the Occurrence Area

