

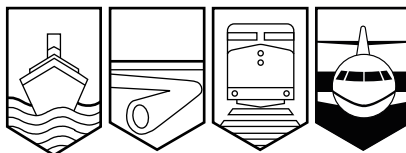
Transportation Safety Board  
of Canada



Bureau de la sécurité des transports  
du Canada

## AVIATION INVESTIGATION REPORT

A01Q0165



### LOSS OF CONTROL AND STALL

PIPER PA-23 C-FDJZ

MONT-JOLI, QUEBEC 22 NM SE

08 OCTOBER 2001

Canada

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 pilot of the Piper PA-23, C-FDJZ, serial number 23-927, took off from Causapsal Airport, Quebec, on a flight to Mascouche Airport, with a 30-minute refuelling stop at Mont-Joli Airport. A flight plan following visual flight rules had been filed with the Mont-Joli Flight Service Station (FSS), indicating an en route time of 3 hours 30 minutes, including the stop at Mont-Joli. At approximately 1225 eastern daylight time, the pilot notified the Mont-Joli FSS that he was climbing and was 23 nautical miles from the airport. At approximately 1231, the pilot informed the FSS that he was in cloud. That was the last transmission received by the FSS. The aircraft was found at approximately 1530, 22 nautical miles southeast of the Mont-Joli Airport by a Canadian Forces helicopter. The four occupants of the aircraft sustained fatal injuries when the aircraft collided with the ground.

*Ce rapport est également disponible en français.*

## *Other Factual Information*

The pilot had obtained his private pilot licence in May 1993 and had obtained night visual flight rules over-the-top (VFR-OTT)<sup>1</sup> and multi-engine endorsements. He had attended a seminar on aviation safety. At the time of the occurrence, his pilot logbook showed 1300 flying hours, with 420 hours on multi-engine aircraft and 15 hours of instrument flight.

A weather analysis for the area of La Rédemption, Quebec, was requested from Environment Canada because the occurrence took place between two observation periods and the occurrence location was in mountainous terrain at a considerable distance from the observation stations, the closest one being near the St. Lawrence River. The analysis confirms that the region was under the influence of the ridge of high pressure extending from Buffalo, New York, to Wabush, Newfoundland, via Chibougamau, Quebec. Barometric pressure at the Mont-Joli, Quebec, station was rising steadily between 1100 and 1400 eastern daylight time,<sup>2</sup> and the air flow in the region was from the northwest at 10 to 20 knots. An analysis of the air data shows the possible development of cumulonimbus clouds reaching 24 000 feet, which was confirmed by a forecaster at Rimouski. The report also mentions that a number of people in the La Rédemption area reported heavy snowfall with low visibility, which they compared to snowy fog. In conclusion, the report mentions that the satellite photos support the reports from the various witnesses regarding the presence of convective clouds and heavy snowfall in the La Rédemption area.

The weather information for 1200 observed at Mont-Joli Airport indicates visibility of 30 statute miles and a ceiling of 3500 feet. The subsequent observations at 1300 and 1400 do not show any visibility or ceilings lower than the ones observed at 1200. The Mont-Joli forecasts for the period of the flight did not indicate any ceilings below 4000 feet or visibility less than 6 statute miles. Communications between Mont-Joli and aircraft that were or had been in the region indicated that the snow was falling heavily and that visibility was reduced in some locations at the time of the occurrence.

The pilot contacted the flight service station at approximately 1110 to find out about the availability of fuel at Mont-Joli and to file a flight plan to be activated at 1230. At 1225, while en route, the pilot called the Mont-Joli radio on the 122.1 MHz frequency to open his flight plan. He also mentioned that he was in cloud, in a VFR-OTT situation, at a distance of 23 nautical miles from Mont-Joli. At 1230:10, after a brief comment from the pilot, the aircraft's microphone stayed on for 5 seconds after the end of the verbal communication. At 1230:20, the microphone remained on for 28 seconds without any communication. At 1230:52, Mont-Joli informed the pilot that his transmitter was on and asked him for an estimated time of arrival at Mont-Joli. At 1230:57, the pilot informed Mont-Joli that he was in very poor weather conditions. The microphone remained on until 1231:07, a little more than 5 seconds without any verbal communication. This communication with the aircraft was the last one recorded by Mont-Joli.

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<sup>1</sup> A pilot may operate an aircraft in VFR-OTT as long as certain conditions concerning weather, aircraft equipment, and pilot rating minima are met. VFR-OTT is allowed only during the day and only during the part of the flight occurring at cruising altitude. Normally, this procedure is used to cross over an area of low cloud as long as the weather forecast at the destination airport allows for a descent and landing in VFR conditions.

<sup>2</sup> All times are eastern daylight time (Coordinated Universal Time minus four hours).

Many attempts were made to contact the aircraft directly by Mont-Joli and via devices that were nearby, but without success.

The aircraft crashed in the woods without cutting or damaging the tips of any trees. The descent slope was almost 90 degrees, because in the last 28 feet before impact, the aircraft slid along a tree trunk, tearing off the branches as it passed, until it hit the ground. The investigation revealed that the aircraft crashed after it stalled. The impact was such that there was no hope of survival for the occupants.

The technical evaluation of the aircraft indicated that the engines had been producing power. Although the fuel tanks had been completely torn apart, the odour of fuel was prevalent at the occurrence site. Before taking off, the pilot had mentioned that he had close to two hours of fuel left in the tanks. The integrity of the controls could be established and no aircraft anomalies could be identified.

The most accurate sensory information available to a pilot about aircraft attitude and motion comes from the visual cues provided by the earth's horizon and from the aircraft's flight instruments. When such information is not available, such as when darkness or weather conditions obscure the horizon or the pilot's attention is briefly diverted from the instruments showing the aircraft's attitude, the pilot's sense of spatial orientation may be taken over by the inner ear, which is a very unreliable source of sensory information during flight. Spatial disorientation occurs when a pilot's sense or "perception of the orientation" of the position, motion, or attitude of the aircraft or him/herself with respect to the earth's surface and the gravitational vertical is based on incorrect or misinterpreted sensory information. Pilots with limited instrument flight time are most susceptible to spatial disorientation.

## *Analysis*

The pilot had a VFR-OTT endorsement authorizing him to fly over the cloud layer. However, the pilot did not have many instrument flight hours.

Considering the communications with Mont-Joli, all indications are that the pilot tried to climb above the cloud layer. The weather information that he had received reflected the situation that was or had been prevailing at Mont-Joli. However, the pilot had to fly over mountainous terrain over which deep convective clouds had formed and which was experiencing heavy snowfall.

The last communications with the pilot indicated a noticeable degree of tension. The pilot said he was encountering weather conditions that were forcing him to fly above the layer and that the weather was getting worse. The initial communications between the pilot and Mont-Joli were normal. However, in later transmissions, the pilot kept the microphone button depressed beyond the end of his message. On one occasion, the pilot pressed the microphone button without transmitting. These factors are often signs of an increased workload and the tension being felt by crew members.

The aircraft was in a stall at the time of impact. In fact, the information retrieved showed that horizontal velocity was low while the slope of descent was very steep without excessive impact speed. Considering that the pilot did not have many hours of instrument flying time, it is likely that he was spatially disoriented and lost control of the aircraft before crashing.

## *Findings as to Causes and Contributing Factors*

1. The pilot continued the flight in deteriorating weather and was experiencing spatial disorientation, resulting in a loss of control of the aircraft, probably due to the combined effects of a lack of instrument flight experience and increasing tension.

*This report concludes the Transportation Safety Board of Canada's investigation into this occurrence. Consequently, the Board authorized the release of this report on 03 July 2003.*

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