

AVIATION OCCURRENCE REPORT

**POWER LOSS IN LEFT ENGINE
DITCHING**

**CONFORTAIR
PIPER NAVAJO PA31-350 C-GVWM
SEPT-ÎLES, QUEBEC 24 mi S
27 JULY 1995**

REPORT NUMBER A95Q0142

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 aircraft, with seven persons on board, was making a charter flight from Lourdes-de-Blanc-Sablon, Quebec, to Mont-Joli Airport, Quebec, in accordance with instrument flight rules (IFR). In flight, at a cruising altitude of 6,000 feet above sea level (asl) and about 50 nautical miles (nm) west of Port-Meunier, Quebec, the left engine lost power. The pilot applied full power on both engines, reported the power loss to the air traffic controller, and continued on his route. He tried to maintain the best rate-of-climb speed on one engine, but the aircraft continued to descend at a rate of about 400 to 500 feet per minute.

Two minutes later, at an altitude of about 4,800 feet asl, the pilot diverted the aircraft to Sept-Îles Airport, Quebec. About 25 nm south of Sept-Îles, the pilot requested assistance, declared an emergency, and said he was going to ditch the aircraft in the St. Lawrence River. At about 1,000 feet asl, the pilot feathered the left engine propeller. He carried out the safety checks for a water landing and advised the passengers of the measures to be taken. After the ditching, the seven occupants evacuated the aircraft via the aft main door. A few seconds later, the aircraft sank. The pilot and passengers treaded water, without life jackets, for about forty minutes before being rescued by a civilian helicopter. No one was injured. The accident occurred in daylight, in meteorological conditions favourable for visual flight.

Other Factual Information

The aircraft was certified and maintained in accordance with existing regulations. On take-off, the weight of the aircraft was at the maximum allowable and the centre of gravity was within the prescribed limits.

The carrier was authorized to operate this type of aircraft without a co-pilot.

The pilot was certified and qualified for the flight in accordance with existing regulations. He was flying the aircraft from the left seat. He had a total of about 530 flying hours, including 230 hours on this aircraft type. He had joined the company two months before and had completed the company training on the Piper Navajo. The pilot had passed an in-flight test on type two months earlier. He was familiar with the route.

A commercial pilot with multi-engine and instrument ratings was in the right seat. He was undergoing training and was familiarizing himself with company operations. He had begun flying as an observer in the right seat about one week previously.

The engine (Lycoming 540-J2BD) had been installed one week previously and had accumulated 12 hours in-flight service since then. This engine is fitted with a turbocharger driven by exhaust gases. When the turbocharger is not functioning, about 75 per cent of engine power is still available. Examination of the technical log-books revealed no deficiencies. A fuel sample taken at the last refuelling airport revealed no evidence of water or contamination.

When the left engine lost power in flight, the pilot felt a yaw and speed decreased. The autopilot disengaged and the aircraft began to lose altitude. A passenger told the pilots that white smoke was coming from the left engine. The pilot initiated the emergency procedures, applying full power on both engines and trying to maintain the single engine best rate-of-climb speed of 109 knots. He observed that the intake pressure gauge indicated 23 inches. According to the pilot, this reading meant that the turbocharger was not functioning and the engine was still developing significant power. He left the engine running and did not consider it necessary to continue the checks and emergency procedures for an engine failure. These procedures include feathering the propeller.

According to the operating manual of the aircraft, with the engine failure checks completed and at the estimated weight, it is possible to obtain a rate of climb on one engine of about 230 feet per minute (fpm) at the indicated airspeed (IAS) of 109 knots. When the propeller is not feathered, drag increases and the aircraft is unable to maintain altitude.

Over a large part of its route, the aircraft was flying over the St. Lawrence River. When the power loss occurred, the aircraft was over water about 55 nm from Sept-Îles, where the company is based, and 15 miles from Sainte-Anne-des-Monts, Quebec, where there is a runway. The pilot felt that the meteorological conditions at that location

were unfavourable for using that runway.

The pilot set a course for Sept-Îles and did not consider the situation sufficiently critical to declare an emergency. He thought he could reach his new destination. When the pilot realized that he could not reach the airport or the coast, and that he would have to ditch, he requested Coast Guard assistance. About five minutes later, the pilot declared an emergency. The controller, however, on his own initiative, dispatched a civilian helicopter to the site.

Shortly after the ditching of the aircraft and the evacuation of the occupants, the aircraft sank in about 850 feet of water. Consequently, it was not possible to recover the wreckage and examine the engine involved. Two aircraft flying over the area guided the helicopter, which arrived at the site about 30 minutes after the aircraft ditched.

The accident pilot and passengers, who were treading water, boarded a raft that was dropped on the water and were hoisted aboard the helicopter a few minutes later. A second helicopter joined the rescue operation and all those who had been on board the ditched aircraft were transported to Sept-Îles Airport.

The aircraft was not equipped with life jackets. In accordance with Transport Canada Air Navigation Orders, a multi-engined aircraft that is able to maintain flight with the critical engine inoperative, and that is not operating more than 50 nm from shore, is not required to carry a life jacket for each person or life rafts with sufficient capacity for all persons on board. After this occurrence, all company aircraft were equipped with life jackets.

An analysis of the flight path was conducted by the TSB Engineering Branch Laboratory using radar data. It was determined that the rate of descent of the aircraft was approximately 500 fpm down to about 1,000 feet asl, where it decreased to about 100 fpm. This analysis showed that, in ideal conditions, with the left engine feathered immediately after the power loss, and speed maintained at 109 knots, the aircraft could have travelled an additional distance of about 130 miles, and would have arrived over Sept-Îles Airport at an altitude of about 2,500 feet asl.

Analysis

As the wreckage has not been recovered, the cause of the engine power loss could not be conclusively determined. However, the yaw, the loss of intake pressure, and the loss of altitude indicate a power loss more substantial than a turbocharger failure alone.

Due to his limited experience, the pilot interpreted the initial indications as a partial power loss and, after reporting it, he decided to continue on his route. According to a study by the University of Illinois, decision-making ability degrades during emergencies and highly stressful situations, and the pilot appears to have simplified his decision making by concentrating exclusively on some of the information available to him. In this case, the pilot did not verify all information: that is, whether the engine power loss was complete

or only partial. Then, after interpreting the pressure gauge reading, he concluded that the engine was developing enough power to reach his diversion base. As a result, he applied full power on both engines and did not carry out the safety checks for a complete engine failure, which include feathering the propeller. As the propeller was not feathered immediately, drag increased considerably and, to maintain speed, the pilot was forced to descend the aircraft. During this time, the fact that he was the only authorized pilot on board did not make the situation any easier.

When the pilot realized that he could not reach his destination, he requested assistance and declared an emergency. However, it is highly probable that the vigilance of the air traffic controller and those participating in the rescue prevented a disaster and, possibly, loss of life.

The following laboratory report was completed:

LP 125/95 - Radar Data Analysis.

Findings

1. The cause of the power loss in the left engine could not be determined.
2. The pilot interpreted the indications of the power loss as a partial power loss.
3. The pilot did not feather the left engine propeller before 1,000 feet asl.
4. The pilot did not carry out all the safety checks for a complete engine failure.
5. The aircraft was unable to reach Sept-Îles and the pilot ditched the aircraft in the river.
6. The aircraft was not carrying life jackets, nor was it required to do so.

Causes and Contributing Factors

A complete power loss in the left engine occurred for an undetermined reason. The fact that the left engine propeller was feathered only at 1,000 feet asl contributed to the inability of the aircraft to reach its destination.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board, consisting of Chairperson John W. Stants, and members Zita Brunet and Maurice Harquail, authorized the release of this report on 24 April 1996.