

No. 7

Douglas DC-3C, N 4997E, accident near Waterville, Newfoundland, on 18 March 1965. Report undated, Serial No. F-364, released by the Department of Transport, Canada

1. - Investigation1.1 History of the flight

The aircraft was on a ferry flight from Miami, Florida, to Manila, Philippines via Gander, Newfoundland, Santa Maria in the Azores and other points. Recorded radio transmissions established that the departure from Gander and climb to 9 000 ft was routine. Approximately 24 minutes after take-off and before the expected report at 11 000 ft, which was the assigned cruising altitude, a short distress message was heard; "97 Echo, we're going in". Radio contact was then lost and a search was initiated. Burning wreckage was reported in the Trinity Bay area, 53 miles south-south-east of Gander International Airport. The accident site was at Lat. 48°16' N, Long. 53°41' W. The accident occurred at 1810 hours, Newfoundland standard time.

1.2 Injuries to persons

Injuries	Crew	Passengers	Others
Fatal	2		
Non-fatal			
None			

1.3 Damage to aircraft

The aircraft was destroyed by impact and fire.

1.4 Other damage

There was no other damage.

1.5 Crew information

The pilot-in-command held a United States airline transport pilot's licence. He had flown a total of 30 000 hours including more than 6 000 hours on DC-3C, of which an estimated 140 hours were flown during the 90-day period preceding the accident. During this period he had completed a number of ferry flights, including one over the same route as the accident flight.

1.10 Aerodrome and ground facilities

Not pertinent to the accident.

1.11 Flight recorders

Not mentioned in the report.

1.12 Wreckage

The accident scene was 54 miles on a bearing of 116⁰M from the Gander VOR station. The nearest community was Waterville, 6.5 miles to the south-west.

The aircraft struck the side of a gently sloping hill at 250 ft ASL in an area of dense bush, low hills and ice-covered lakes.

Evidence at the scene including broken trees, marks on the trees and the degree of impact damage established the aircraft struck the ground in a nose down attitude of between 45⁰ and 65⁰, with relatively low forward speed while on a heading of 120⁰M. After impact it fell back to a nearly level position and tree stumps penetrated the wings in various places.

1.13 Fire

Most of the fuselage was destroyed by fire, but the nature of the fire damage and lack of soot streaks indicated that the fire occurred after impact.

1.14 Survival aspects

This was a non-survivable accident.

1.15 Tests and research

The entire left engine, both propeller hubs with portions of the blades, the pitch control units, all recovered instruments, and an overhead switch panel were removed for laboratory examination. A section of the right cabin fuel tank was taken for metallurgical study.

The left engine was found to have no internal or external mechanical defects although the ignition and carburetting systems could not be examined properly due to fire damage. The engine specialists considered it had not been developing power at impact. The condition of the propeller components confirmed that the left engine had been wind-milling or at very low power and the right engine had been developing almost full power at impact. The propeller blades were in the low pitch position.

It was determined that a crack in the forward lower face of the right cabin fuel tank had been present before the crash and had been peened over, possibly during manufacture. A specialist's report suggested leakage could have resulted, had paint, covering the crack, dissolved.

The co-pilot, who occupied the right seat, held a United States commercial pilot's licence. He did not hold an instrument flight rating. He had flown a total of approximately 1 200 hours including 100 hours on the DC-3C, and had flown as co-pilot over the same route as the accident flight. During the 90-day period preceding the accident, he had flown approximately 140 hours, of which 85 hours were on DC-3C.

1.6 Aircraft information

A certificate of airworthiness had been issued for the aircraft.

The aircraft was in a passenger-carrying configuration, with extra fuel tanks installed for the ferry flight. The front passenger seats had been removed and stored aft and two 250 U.S. gallon capacity tanks had been installed at the front of the cabin. Metal fittings and flexible lines carried the fuel from the tanks to the regular fuel system. The tanks and some of the fittings did not meet aeronautical specifications, but the installation had been approved for the ferry flight along with the attendant 10% overload condition which allowed a gross take-off weight of 28 820 lb. The weight of the aircraft at take-off was calculated to be 28 814 lb and the centre of gravity was within allowable limits.

The type of fuel being used was not stated in the report.

1.7 Meteorological information

The weather at Bonavista, 20 miles from the accident scene, was reported to be:

Cloud	at 2 500 ft overcast
Visibility:	15 miles
Temperature:	31°F
Dew-point:	29°F
Wind:	310°M at 32 mph

Witnesses near the scene described similar weather conditions. The top of the cloud layer was at 8 000 ft, and there was light rime icing in the cloud. Flight conditions were smooth with no turbulence.

1.8 Aids to navigation

Not mentioned in the report.

1.9 Communications

The co-pilot was handling the communications at the time of the accident. No difficulty was reported up to the time of the sudden distress message.

2. - Analysis and Conclusions

2.1 Analysis

Witnesses about 14 miles south-west of the accident site said that their attention was attracted by the abnormal sound of the aircraft engines. According to other witnesses near the accident site, the shape of the aircraft and the aircraft lights could be seen at about 1 000 ft above the terrain. The aircraft was performing some extreme manoeuvres described as "rolling". The engine noise was described as "dying out and then revving up again". No fire was seen while the aircraft was airborne, and no lights were observed in the cabin.

Most witnesses believed that engine difficulty was being experienced and it was later established that the right engine was developing almost full power and that the left engine was windmilling or at low power at the time of impact.

Although the pilot-in-command was very seldom known to leave his seat he obviously did so prior to the final impact, since he was found behind the cabin fuel tanks which moved forward at impact and blocked the exit from the pilot compartment. He may have gone to the rear of the aircraft to attend to some emergency condition such as an unlocked airstair door or a suspected leak in the cabin fuel tanks. At the probable time of this action, the aircraft would be above the cloud layer and in conditions of good visibility and it would have been acceptable to leave the co-pilot alone at the controls.

The rear cargo door and airstair door were found unlocked and partially open in the wreckage. It was believed that this occurred during the crash when the aircraft fell back to a level position after having brushed trees.

In view of the evidence it was considered probable that the pilot-in-command went to the rear of the aircraft during flight to attend to some emergency condition, the nature of which could not be determined. It was further considered probable that at this time engine difficulty was experienced, possibly an engine cutting in and out, which produced an asymmetric power condition which was beyond the capability of the co-pilot to control.

2.2 Conclusions

Findings

The crew were properly certificated.

Weather was not a factor in this accident.

It was believed that during the time the pilot-in-command was attending an emergency of unknown nature in the rear, engine difficulty leading to an asymmetric power condition was experienced by the co-pilot who lost control of the aircraft.

Cause or Probable cause(s)

Loss of control following an emergency of an undetermined nature.

3. - Recommendations

None were contained in the report.