Transportation Safety Board of Canada

Bureau de la sécurité des transports du Canada

AMENDED REPORT

AVIATION INVESTIGATION REPORT
A00W0097

REJECTED TAKE-OFF / RUNWAY OVERRUN

AIR CANADA DOUGLAS DC-9 C-FTLM
EDMONTON INTERNATIONAL AIRPORT, ALBERTA
11 MAY 2000

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 Air Canada Douglas DC- 9, C-FTLM, serial number 47022, carrying 5 crew members and 86 passengers, was taking off from Edmonton International Airport, Alberta, on Runway 20. The first officer was the pilot flying. The aircraft accelerated smoothly during the take-off roll. Just after the rotate call, the aircraft passed through a flock of birds. Several thuds were heard, the right engine (JT8D-7) engine-pressure ratio (EPR) and the engine fan speed started decreasing, rhythmic thumping sounds were heard, and the captain saw the left engine EPR indicator fluctuated. The captain called for a reject, took control, closed the throttles, then selected reverse thrust; only the left engine operated in reverse. The first officer deployed the spoilers and advised the tower that they were aborting. Full braking was applied immediately. The aircraft overran the runway onto the grass at about 50 knots and continued for about 500 feet before coming to a stop directly over the runway centreline lights of Runway 12/30. Both engines were then shut down.

The flight attendant in charge was briefed, as were the passengers. After determining that there was no fire or other danger, it was decided to keep the passengers on the aircraft until transportation arrived, and the passengers were asked to remain seated. No one was physically injured. The airport emergency response services responded immediately and placed cooling fans on the wheels. The auxiliary power unit was started to ensure communications with the tower and emergency response services and so as not to deplete battery power. While waiting for transportation, the captain walked through the cabin to reassure the passengers and the cabin crew. The passengers disembarked from the aircraft about 30 minutes after the incident and were bused to the terminal. The overrun occurred at 2004 mountain daylight time.

Ce rapport est également disponible en français.

Other Factual Information

The latest weather observation, taken at 2000 mountain daylight time,[1] was as follows: wind 270° true at 8 knots; visibility 15 statute miles; scattered cloud at 6000, 12 000 and 26 000 feet; temperature 7°C; dew point 1°C; and altimeter setting 29.95 inches of mercury. A special observation taken at 2013 showed the wind to be 290° true at 10 knots, with the visibility and the cloud cover the same as reported at 2000.

The captain had completed a line check on 20 January 2000 on the DC-9 aircraft. The first officer had completed a pilot proficiency check on 03 February 2000. On the day of the occurrence, both crew members began their duty day in Toronto, Ontario, deadheading from Toronto to Vancouver, British Columbia. Their first flight was to Edmonton, Alberta, lasted about 1.3 hours, and was uneventful. It was flown by the captain. Turnaround time at Edmonton was 1.5 hours. Both cockpit crew members were well rested.

Runway 20 is 11 000 feet long. From the Air Canada Weight Limitations Max Take-off chart for YEG Edmonton, dated 24 January 2000, it was determined that the maximum take-off weight for the aircraft would have been 105 800 pounds at 7°C with the flaps retracted. The actual take-off weight was calculated to be 103 400 pounds, which required that zero flap be used. It is not normal to take off with a zero flap setting, but it is used for take-offs at high aircraft weight and/or high density altitude situations. The calculated V_1, V_R, and V_2 were 151, 153, and 158 knots, respectively.[2] Except in critical situations, a take-off is continued once the aircraft has reached V_1.

The data from the flight data recorder showed a sharp drop in the right engine-pressure ratio (EPR) as the aircraft was accelerating through 163 knots. About two seconds later, the left engine also decelerated, the result of the throttle being closed. The right engine dropped to idle power and stayed there. Just before reaching idle power, the left engine accelerated as reverse thrust was applied. The take-off was rejected as the aircraft reached about 167 knots, with a nose-up attitude of about 7° and with about 3000 feet of runway remaining. There was no indication on the flight data recorder of any loss of power from the left engine. Discussions with company personnel suggested that, when one engine fails, there would be a slight momentary EPR fluctuation in the good engine while the air pack is closed.

Nothing was found to indicate that an aircraft mechanical anomaly contributed to the occurrence. The brakes worked properly during the reject, as revealed by the tire tracks left on the runway and as related by the flight crew. Company maintenance personnel determined that the right engine was extensively damaged from bird ingestion and that the left engine had some turbine blade damage. Some debris, believed to have been ingested after the aircraft left the runway, was found in the left engine.

Bird activity was being reported on the automatic terminal information service (ATIS), and the crew heard the ATIS report before push-back. Both crew were monitoring the ground frequency while taxiing and heard a comment about bird activity from an aircraft that had landed. On switching to tower frequency just before being instructed to taxi to position for take-off, he heard a fragmented transmission—"they are off now" or "they have moved off now"—leaving him to believe that the hazard had diminished. The crew were not advised by air traffic control

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

[2] V_1 is take-off decision speed, V_R is rotation speed, and V_2 is take-off safety speed.

of any bird hazards before departure. The captain selected continuous ignition, which is a standard precaution.

The Edmonton International Airport Authority has an active Wildlife Management Program aimed at reducing bird and animal activity at and around Edmonton International Airport. About two weeks before this occurrence, the dry, dead grass along the runways had been burned to rid the area of cover for small rodents, such as mice, which in turn attract gulls and birds of prey.

Noise makers near the two runways fire at intervals to scare birds away. The noise makers were active on the evening of 11 May 2000. Wildlife Management staff and emergency response services staff patrol the runways hourly during the daytime and, when necessary, shoot birds along the runways. On the day of the occurrence, several gulls were shot near both runways. The birds that were ingested into the right engine were identified as ring-billed gulls.

Analysis

The take-off was rejected after the aircraft exceeded V_1, where, normally, the take-off would have been continued. The take-off was rejected because, in the instant available to make a decision, the captain decided it would be safer to stop than to continue: he thought that some or all of the power on both engines was lost. This mental picture was the result of the aircraft passing through a flock of birds, the sound of loud thuds and popping noises (the engine compressor stalling), a drop in the right engine's EPR and engine fan speed, and a momentary fluctuation of the left engine's EPR.

At zero flaps and the take-off speed appropriate for the aircraft's weight and altitude and the temperature, a rejected take-off at or before V_1 should have been successful. Because the weight was near the maximum allowable, even a very short delay in reject initiation would result in an overrun. Considering the aircraft's speed when the reject was initiated, there was not enough runway available on which to stop the aircraft.

Findings as to Causes and Contributing Factors

1. During the take-off run, the aircraft struck birds after passing V_1, and the take-off was rejected. The captain believed that both engines were damaged to the extent that continuing flight posed a greater risk than a rejected take-off.

2. The take-off was rejected at about 167 knots, with 3000 feet of runway remaining. The aircraft could not be stopped on the runway.

Safety Action

Transport Canada has produced a notice of proposed amendment (NPA) to regulate wildlife control at Canadian airports. The Canadian Aviation Regulation Advisory Council is reviewing the NPA.

Transport Canada has published *Sharing the Skies: An Industry Guide to the Management of Wildlife Hazards* (TP 13549), which provides information on the hazard and guidance in managing the risks associated with wildlife on and near airports.

This report concludes the Transportation Safety Board's investigation into this occurrence. Consequently, the Board authorized the release of this report on 26 June 2002.