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RELEASE OF TRANSPORTATION SAFETY BOARD OF CANADA FINAL REPORT

ON THE LOSS OF CONTROL ON GO-AROUND AT FREDERICTON, NEW BRUNSWICK, OF AN AIR CANADA CANADAIR REGIONAL JET, C-FSKI, 16 DECEMBER 1997, A97H0011

(Fredericton, New Brunswick) 26 May 1999 - The final report on the Transportation Safety Board of Canada's investigation into the accident involving an Air Canada Regional Jet at Fredericton, New Brunswick, on the night of 16 December 1997, has been released today.

Air Canada Flight 646, departed Toronto-Lester B. Pearson International Airport, Ontario, at 2124 eastern standard time on a scheduled flight to Fredericton. On arrival, the visibility was reported to be one-eighth of a mile in fog, and the ceiling was reported to be obscured at 100 feet. The crew conducted an instrument landing system (ILS) approach to runway 15.

On reaching about 35 feet over the runway, the captain assessed that the aircraft was not in a position to land safely and ordered the first officer, who was flying the aircraft, to go around. As the aircraft's nose was raised to its go-around pitch attitude of about 10 degrees, the aircraft stalled aerodynamically, and struck the runway. The aircraft veered to the right, travelled uncontrolled at full power about 2100 feet from the first impact point, struck a large tree and came to rest. An evacuation was conducted; however, seven passengers were trapped in the aircraft until rescued. Of the 39 passengers and 3 crew members, 9 were seriously injured and the rest received minor or no injuries. The accident occurred at 2348 Atlantic standard time.

A number of safety actions have already been taken by Air Canada, Bombardier, and Transport Canada (TC) that will help address some of the problems identified during the course of this investigation: a change in aircraft anti-ice procedures; initiation of requirements for Emergency Locator Transmitters (ELT); new procedures and training for go-arounds, especially in low-visibility conditions; and new wing-maintenance procedures. However, in the Board's view, more needs to be done to address the deficiencies highlighted in this investigation; the final report includes two aviation safety recommendations.

The first recommendation deals with current regulations regarding low visibility approaches and landings using instrument landing systems. At the time of the landing, the area was experiencing foggy conditions. The present Canadian regulations permit approaches and landings in conditions that would not have been permitted in most other countries, including the United States.

As part of its investigation, the Board reviewed occurrences between 1984 and 1998 in Canada and the United States involving large aircraft landing in poor visibility. Of the 46 accidents reviewed, 18 occurred in the United States and 28 occurred in Canada, the most serious being

this accident in Fredericton.

In order to reduce the risk of accidents in poor weather during the approach and landing phases of a flight, the Board has recommended that the Department of Transport reassess approach and landing criteria for this type of instrument approach, taking into account such conditions as the actual visibility on the runway, the approach and runway lighting, the aircraft's onboard equipment, and the pilots' qualifications and recurrent training.

The second recommendation deals with ensuring that pilots are aware of the dangers of performing low-energy go-arounds. In this occurrence, the throttles had been set at idle on the final approach to the runway. When the go-around was called there was not sufficient time for the engines to power up to the required thrust levels before the aircraft stalled and hit the ground. Transport Canada has issued an Advisory Circular about the hazards of low-energy go-arounds, particularly in turbo-jet aircraft. Since circulars are essentially a one-time item, in the Board's view there needs to be some process to ensure that pilots are informed of and maintain their awareness of the risks involved with low-energy go-arounds. The Board therefore recommended that the Department of Transport ensure that pilots operating turbo-jet aircraft receive training in, and maintain their awareness of, the risks of low-energy conditions, particularly low-energy go-arounds.

The aircraft stalled aerodynamically while it was travelling at a speed greater than would normally have been associated with such a stall. The aircraft spent at least 60 seconds in icing conditions on its final approach to land. Since the ice detection system had not issued any warning, the anti-ice equipment was not turned on. The Board looked at possible explanations for the stall, and concluded that the physical condition of the wing's leading edge and the ice build up, while travelling through icing conditions, reduced the ability of the wing to produce lift. Because of the reduced lift, the speed at which the aircraft would stall was raised above the normally expected stall speed.

In order to reduce the risk of aircraft stall during a critical stage of flight, Air Canada has issued changes to its operating manual to ensure that the anti-icing system is turned on in conditions that would lead to ice build-up on the wing. As well, Air Canada has enhanced its maintenance procedures dealing with the physical condition of the wing's surface.

Air Canada has made changes to procedures and training for its Regional Jet flight crews, especially for low visibility and low-energy approaches to landing. Also, the training syllabus for flight and cabin crew emergency training has been changed.

After the accident occurred, it took about 15 minutes to locate the crashed aircraft. It was night and the visibility was reduced because of the fog. The aircraft did not have an emergency locator transmitter (ELT) on board. Under the *Canadian Aviation Regulations* (CARs), turbo-jet aircraft operating under the conditions of the accident aircraft are exempt from carrying ELTs. The TSB issued a Safety Advisory in February of 1998 suggesting that TC consider reviewing the CARs with a view to eliminating this ELT carriage exemption. TC is in the process of amending the regulations to require that ELTs be carried on all turbo-jet aircraft.

After the aircraft was located, it took approximately 35 minutes to plow a roadway through the deep snow to the accident site. The Board noted that the emergency response services were as

effective as the conditions and equipment would permit. While the rescue took a relatively long time, this was largely due to the difficulties faced by the persons involved with the rescue of the trapped passengers. The emergency response personnel first had to find the aircraft in the low visibility conditions, then the volunteer rescue teams had to construct a road to the site through deep snow, a number of the passengers were trapped in the aircraft and required the jaws-of-life to free them, and the accident site was almost a kilometre from the terminal building.

The Board noted that there was a Flight Service Specialist, as opposed to a tower controller, at the airport at the time of the arrival of flight ACA 646, but this made no difference to the outcome of this occurrence.

The Transportation Safety Board of Canada is an independent agency operating under its own Act of Parliament. Its sole aim is the advancement of transportation safety. It is not the function of the Board to assign fault or determine civil of criminal liability.

-30-

This communiqué and report are available on the TSB Internet site at: **http://www.bst-tsb.gc.ca**

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