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Flight recorder centre probes possible causes of air crashes

One of the first concerns of accident investigators when a commercial aircraft crashes in Canada is to locate the flight recorder. If the recorder is functioning properly at the time of impact and is relatively intact, the investigating team can be sure that its task will be simplified significantly. This was demonstrated in the major crash of a DC8 aircraft at Toronto in 1970 when the recorder revealed the primary cause of the accident within 24 hours.

By contrast, in an earlier DC8 accident at Ste. Thérèse, Quebec, in 1963, in which 118 lives were lost, the aircraft did not carry any flight recorders. The investigators spent more than six months searching for clues in the wreckage both in the main crater and in the "scatter" area that extended for 1,500 feet.

It was largely as a result of this investigation that the Ministry of Transport (MOT) formulated requirements for comprehensive flight data and cockpit voice recorders on all Canadian-registered commercial transport aircraft. These came into effect in 1969, though Air Canada had already equipped most of its aircraft with advanced data recorders several years earlier.

Importance of voice recorders

In addition to the data recorders, there is also a requirement that the aircraft be fitted with cockpit voice recorders that retain the previous 30 minutes of information. These normally record three or four separate channels that include all radio and aircraft interphone communications and, most important, all conversation and sounds detected by a microphone on the flight deck. These voice recorders proved invaluable in many accident investigations. As with the data recorders, several different types of voice recorder are currently in service in Canadian-registered aircraft.

The Canadian Armed Forces have

also undertaken a program to fit their transport aircraft with a combined data and voice recorder that retains the previous 30 minutes of information. Unlike the civil aircraft recorders that are fitted in an armoured container and surrounded with insulation for survival in an accident, the Armed Forces recorders are mounted, with a radio-locator beacon, in lightweight aerofoil devices that are designed to separate from the aircraft if it crashes and lands nearby. This system was originally developed in the Flight Research Laboratory of the National Aeronautical Establishment of the National Research Council of Canada.

There is little standardization among the various data and voice recorders; playback facilities vary considerably in their availability and capability. Inadequate monitoring of the recorders has led to a high occurrence of un-serviceability when, as the result of accidents or incidents, the data are urgently required.

Role of NRC

In an attempt to improve on this situation, MOT and the Department of National Defence (DND) asked National Research Council (NRC) to set up a flight-recorder data playback centre at the National Aeronautical Establishment at Uplands Airport near Ottawa.

MOT and DND are providing annual grants of \$20,000 each for two years to finance the centre acquisition of equipment not already in the possession of the Flight Research Laboratory.

The Laboratory has undertaken a program designed to permit the gradual build-up of an ability to process original digital flight data into computer-compatible IBM format for print-out and subsequent processing on the NRC IBM 360 computer. Facilities are also being developed to handle all types of cockpit voice recorders, to make recorded conversation more in-