

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: July 13, 1982

Forwarded to:

Honorable J. Lynn Helms  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-82-56 and -57

On February 21, 1982, a Pilgrim Airlines DHC-6-100, N127PM, operating as Flight 458 between Groton, Connecticut, and Boston, Massachusetts, was forced to make an emergency descent from cruising altitude because of an in-flight fire in the cockpit and forward cabin areas. The aircraft, with 10 passengers and 2 crewmembers on board, crashlanded on the frozen surface of the Scituate Reservoir near Providence, Rhode Island. The fire continued to burn after the aircraft came to rest and completely destroyed the cockpit and passenger cabin. One passenger was killed as a result of the accident.

Although the National Transportation Safety Board's investigation of the accident is still in progress, interviews with the surviving passengers revealed that the smoke and fire were preceded by the smell of alcohol. The copilot reported that ice had formed on the windshield and that he had activated the deicing switch twice before noticing smoke rising from the base of the control column yoke. The windshield deicing system installed on the accident aircraft uses 100 percent isopropyl alcohol. The manufacturer's installation consists of a polyethylene reservoir (1.5-gallon capacity) mounted in the cockpit to the left of the pilot's seat pan. The reservoir is connected to the inlet of a 24-volt D.C. electric motor-driven pump through 1/4-inch-diameter tygon plastic tubing (vinyl base). The pump is located on a bulkhead underneath the cockpit floor about 4 feet below the reservoir. The pump pressure outlet is connected to the windshield spray nozzles through 1/8-inch-diameter tygon tubing. The pressure tubing passes above numerous potential ignition sources as it runs forward and upward to the spray nozzles. The tubing-to-fitting connections are made by slipping the tubing over the ends of beaded fittings and securing them with three strands of safety wire. Pilgrim Airlines personnel reported that the tubing ends become brittle with service use and that on several occasions the tubing has separated from the pump fittings, resulting in alcohol leaks during flight.

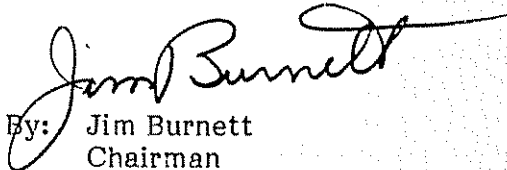
The Safety Board believes that the isopropyl alcohol windshield deicing installation on the DHC-6 model aircraft configured for operation in icing conditions presents a fire hazard which should be eliminated. It is the Safety Board's understanding that deHavilland Aircraft offers a heated windshield as an alternate installation for those aircraft.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue an Airworthiness Directive to require a redesign and modification of isopropyl alcohol windshield deicing systems installed on DHC-6 aircraft to eliminate the potential for alcohol leakage or, if practicable, to require replacement of these systems with the electrically heated windshields offered by the manufacturer as an alternative installation. (Class II, Priority Action) (A-82-56)

Review and evaluate the design of all isopropyl alcohol windshield deicing system installations on aircraft to verify compliance with applicable Federal Aviation Regulations pertaining to flammable fluid fire protection, and take action to correct any deficiencies found. (Class II, Priority Action) (A-82-57)

BURNETT, Chairman, GOLDMAN, Vice Chairman, McADAMS and BURSLEY, Members, concurred in these recommendations.

  
By: Jim Burnett  
Chairman