

Log 1606

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: July 19, 1983

Forwarded to:

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

SAFETY RECOMMENDATION(S)

A-83-47 through -49

On June 2, 1983, an in-flight fire occurred on board Air Canada Flight 797, and following an emergency landing at the Greater Cincinnati Airport, the cabin interior of the McDonnell Douglas DC-9-32 continued to burn. Five crewmembers and 18 passengers were able to evacuate the burning cabin; the remaining 23 passengers died in the fire.

The National Transportation Safety Board's continuing investigation of the accident has disclosed that the in-flight fire began in or near the left rear lavatory. Although there was an indication of a problem before the fire was detected by cabin attendants -- the circuit breakers for the three-phase, electric flushing pump motor in the left lavatory tripped -- the Safety Board has not related at this stage of the investigation any specific airplane components or systems to the fire's ignition source. An intensive investigation is continuing to determine the ignition source and the fire propagation pattern. The Federal Aviation Administration (FAA), the Transport Canada Aviation Safety Bureau, the Douglas Aircraft Company, and Air Canada are participating in the Board's investigation.

As part of this effort, the Transport Canada Aviation Safety Bureau has conducted an inspection of lavatory flushing motors which previously had been removed from Air Canada's DC-9s and other type airplanes. An examination of 69 flushing pump motors has disclosed that there was evidence of corrosion in many of the motors and overheat on internal wiring and armature windings of 32 of the motors. Examinations of other airplane lavatories have revealed damage to wiring harnesses associated with the flush pump motor circuit. Preliminary testing by the Safety Board of a motor which had no corrosion damage has indicated that the heat emanating from a jammed or defective flushing motor is not sufficient to initiate combustion. However, both the Transport Canada Aviation Safety Bureau and the National Transportation Safety Board believe that additional testing using pump motors with corrosion damage is required to determine whether external wiring or motor overheat is a potential fire hazard. Concern regarding a possible safety hazard associated with flushing motors was heightened by an incident on July 12, 1983, when smoke was observed that was traced to a rear lavatory on an American International Airways DC-9 which was being serviced while on the ground at Charlotte, North Carolina. The airplane's electrical system was being powered by a ground electrical power source when smoke was first observed. Shortly thereafter, witnesses noted that several circuit breakers, including those for the three-phase electric flushing motor, had tripped. Additional smoke was observed, but there was no evidence of fire damage to the airplane. The flushing motor from the American International DC-9 airplane was examined, and evidence of overheat similar to that found in the motors inspected by the Aviation Safety Bureau was discovered.

As a result of these preliminary findings, the National Transportation Safety Board and the Transport Canada Aviation Safety Bureau both believe that actions must be taken by their respective aviation authorities to assure that the internal wiring and armature windings in lavatory flushing pump motors are free from corrosion and insulation damage and that the wiring harnesses and motors are not exposed to corrosion-producing contaminants.

In a related matter, on June 25, 1983, the Safety Board was notified of a fire aboard an Eastern Air Line DC-9 airplane which occurred as the airplane was landing at Tampa, Florida. The fire began in the aft lavatory waste receptacle, and the source of ignition remains under investigation. The fire was not contained within the waste receptacle, and, as a result, the lavatory was damaged before the fire was extinguished by the airport fire department. The examination of the waste receptacle on that airplane revealed that it did not meet the requirements of Airworthiness Directive (AD) 74-08-09. Consequently, on July 1, 1983, the Safety Board recommended that the FAA immediately inspect the waste receptacles of airplane lavatories for conformity to AD-74-08-09 (Safety Recommendation A-83-46). The Safety Board appreciates the FAA's prompt actions to emphasize these inspections by issuing General Notice (GENOT) No. 8320.283 as described in your letter of July 11, 1983. The waste receptacle on the American International DC-9 involved in the July 12, 1983, incident was similarly deficient, further reinforcing our view that positive action is warranted.

Moreover, there was a significant accumulation of waste material adjacent to the waste receptacle under the area of the amenities portion of the vanity found on the previously cited American International DC-9. The Safety Board is concerned that this material can be potentially combustible. Therefore, the Safety Board believes that, in addition to an inspection of the waste receptacle itself as described in Safety Recommendation A-83-46, the areas adjacent to the receptacle should be required to be inspected periodically to assure that potentially combustible material does not accumulate.

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

Issue an Airworthiness Directive (1) to require an immediate inspection of the lavatory flushing pump motor and the associated wiring harnesses between the timing components and the motor in the lavatories of transport category airplanes for evidence of moisture-induced corrosion or deteriorated insulation and to require that flushing pump motors or wiring harnesses which exhibit such conditions be replaced, and (2) to establish appropriate periodic intervals for repetition of these inspections. (Class I, Urgent Action) (A-83-47).

Establish, in conjunction with the flush pump motor, timer, and airframe manufacturers, a procedure which airline maintenance personnel could employ to verify that the electrical circuitry of lavatory flushing pump motors has not been damaged by corrosion or other causes so as to produce excessive heat during motor operation. (Class II, Priority Action) (A-83-48).

Issue a Maintenance Alert Bulletin to require Principal Maintenance Inspectors to assure that airlines have an acceptable program (1) for the frequent removal of waste from all areas of the lavatory with particular attention to those enclosed areas in and around the waste receptacles,

and (2) which gives sufficient emphasis to areas susceptible to the accumulation of fluids in the vicinity of wire harnesses and other electrical components which can cause corrosion. (Class I, Urgent Action) (A-83-49).

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


By: Jim Burnett
Chairman