NTSB Recommendation A-83-073

Rec #: A-83-073
NTSB Status: Closed - Acceptable Action
Issue date: 10/31/1983
Accident Date: 6/2/1983
Source Event: ACCIDENT
Location: CINCINNATI Ohio

Mode: AVIATION
Most Wanted List: No
Closed date: 6/2/1986

Report Number: AAR-84-09
Accident ID: DCA83AA028

Background Synopsis:

THE NATIONAL TRANSPORTATION SAFETY BOARD IS CONTINUING ITS INVESTIGATION OF THE ACCIDENT INVOLVING AIR CANADA FLIGHT 797 WHICH OCCURRED ON JUNE 2, 1983, WHEN THE FLIGHTCREW OF THE MCDONNELL DOUGLAS DC-9 AIRPLANE WAS FORCED TO MAKE AN EMERGENCY LANDING AT THE GREATER CINCINNATI AIRPORT BECAUSE OF AN IN-FLIGHT FIRE. THE INTERIOR MATERIALS OF THE AIRPLANE'S CABIN CONTINUED TO BURN AFTER THE LANDING. FIVE CREWMEMBERS AND 18 PASSENGERS WERE ABLE TO EVACUATE THE BURNING CABIN; THE REMAINING 23 PASSENGERS DIED IN THE FIRE. THE SAFETY BOARD'S INVESTIGATION HAS DETERMINED THAT THE FIRE BEGAN IN THE AIRPLANE'S LEFT REAR LAVATORY, BUT THE SOURCE OF IGNITION HAS NOT YET BEEN IDENTIFIED. TO PROMOTE A COMPREHENSIVE PROGRAM TO ADDRESS THE POTENTIALLY HAZARDOUS SITUATION POSED BY IN-FLIGHT FIRES, THE SAFETY BOARD IS ISSUING NEW SAFETY RECOMMENDATIONS RATHER THAN REITERATING RELEVANT SAFETY RECOMMENDATIONS PREVIOUSLY ISSUED TO THE FAA.

Recommendation:

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: EVALUATE THE ELECTRICAL CIRCUIT PROTECTION, INCLUDING REDUCED CIRCUIT BREAKER RATED VALUES AND INTEGRAL COMPONENT THERMAL PROTECTION DEVICES, NEEDED TO ELIMINATE THE POTENTIAL FOR OVERHEATING OF THE WIRING AND COMPONENTS IN THE LAVATORY FLUSHING PUMP MOTOR SYSTEMS IN TRANSPORT CATEGORY AIRPLANES AND ISSUE AIRWORTHINESS DIRECTIVES AS REQUIRED.

Correspondence:

Response Date: 1/27/1984 From: Addressee
Response:
FAA COMMENT: THE FAA HAS EVALUATED THE ELECTRICAL DESIGN DETAILS OF LAVATORY FLUSHING PUMP MOTOR SYSTEMS ON TRANSPORT CATEGORY AIRPLANES AND HAS IDENTIFIED SEVERAL SITUATIONS WHERE IMPROVEMENT IN WIRE ROUTING, CIRCUIT BREAKER PROTECTION, AND/OR THERMAL PROTECTION COULD BE MADE. AT THIS TIME, THE VARIOUS OPTIONS FOR MODIFICATION ARE BEING DEVELOPED. ACTION ON THIS PROJECT IS SCHEDULED TO BE COMPLETED BY MARCH 1984. MANDATORY ACCOMPLISHMENT OF THE MODIFICATIONS IS UNDER CONSIDERATION.

Response Date: 7/9/1984 From: NTSB
Response:
The FAA's action in identifying design details of lavatory flushing pump motor systems, where improvements could be made to reduce the potential for fire ignition, meets the intent of this Safety Recommendation. The Safety Board notes that the FAA planned to have this evaluation completed by March 1984. Discussions with FAA staff indicate that a firm date for completion of the evaluation has still not been set. The Safety Board wishes to re-emphasize the need to eliminate the potential for electrical overheating in lavatory flushing pump systems, and the need for the FAA to incorporate improvements into the air carrier fleet as soon as possible. This recommendation will be classified as "Open--Acceptable Action" until the FAA notifies the Safety Board regarding which engineering options it selected and details as to the implementation of these modifications.

Response Date: 1/22/1985 From: Addressee
Response:
FAA LTR: THE FAA HAS COMPLETED ITS EVALUATION OF THE LAVATORY PUMP MOTOR SYSTEMS ON TRANSPORT CATEGORY AIRPLANES AND HAS CONCLUDED THAT ONLY THE MCDONNELL DOUGLAS DC-9 AIRPLANES, FUSELAGE NO. 855 AND PRIOR, REVEAL A POTENTIALLY HAZARDOUS CONDITION REQUIRING MANDATORY ACTION. MCDONNELL DOUGLAS DC-9 SERVICE BULLETIN 24-76, WAS RELEASED ON SEPTEMBER 30, 1984. THIS BULLETIN PROVIDES THE INSTRUCTIONS FOR REROUTING THE WIRE HARNESS OUTBOARD AND AWAY FROM THE PUMP ASSEMBLY, THEREBY REMOVING POTENTIALLY HAZARDOUS CONDITIONS. ON OCTOBER 1, 1984, A NOTICE OF PROPOSED RULEMAKING DOCKET NUMBER 84-NM-99-AD WAS PUBLISHED IN THE FEDERAL REGISTER (COPY ENCLOSED) THAT PROPOSES AN AIRWORTHI NESS DIRECTIVE (AD) BE ISSUED TO REQUIRE ACCOMPLISHMENT OF THE REROUTING MODIFICATION ON ALL AFFECTED AIRPLANES. THE PUBLIC COMMENT PERIOD ON THIS NPRM ENDED ON DECEMBER 20, 1984. AFTER COMPLETION OF OUR REVIEW OF THE COMMENTS WE WILL ADVISE THE BOARD OF OUR PROPOSED ACTIONS.

Response Date: 5/10/1985 From: NTSB
Response:
The Safety Board is pleased to learn that the FAA has completed its evaluation of the lavatory pump motor systems on transport category airplanes. The Safety Board notes that the evaluation revealed that a potentially hazardous condition was detected only in McDonnell Douglas DC-9 airplanes of fuselage numbers 855 and prior, and that a Notice of Proposed Rulemaking has been prepared to require modification of these airplanes. Pending the issuance of the airworthiness directive, Safety Recommendation A-83-73 has been classified as "Open--Acceptable Action."

Response Date: 2/27/1986 From: Addressee
Response:
ENCLOSED FOR THE BOARD'S INFORMATION IS A COPY OF A FINAL RULE THAT WAS ISSUED ON MARCH 27, 1985, AND BECAME EFFECTIVE ON MAY 13, 1985. THIS AMENDMENT ADDS A NEW AIRWORTHINESS DIRECTIVE (AD 85-07-10) WHICH REQUIRES REROUTING OF THE TOILET FLUSH MOTOR POWER WIRE HARNESS IN THE FORWARD AND AFT LAVATORIES ON CERTAIN MCDONNELL DOUGLAS MODEL DC-9 AND C-9 (MILITARY) SERIES AIRPLANES. THIS ACTION WAS NECESSARY TO AID IN ELIMINATING A POTENTIAL FIRE.

Response Date: 4/16/1986 From: Addressee
Response:
Enclosed for the Board's information is a copy of Airworthiness Directive (AD) 85- 07-10 that was issued on March 27, 1985, and became effective on May 13, 1985. This AD requires rerouting of the toilet flush motor power wire harness in the forward and aft lavatories on certain McDonnell Douglas Models DC-9 and C-9 (military) series airplanes. In addition, the FAA evaluated the electrical circuit protection on transport category airplanes. This evaluation showed that there have been numerous incidents of smoke emanating from the lavatory toilet areas and that these incidents were the result of burned pump motor windings. However, from electrical load and temperature tests which were conducted as part of the evaluation, it has been determined that the pump motor is not a fire ignition source. Also, the circuit breaker ratings are appropriate for the application and are in compliance with 14 CFR 25.1357. Some airplane manufacturers have issued service bulletins for the addition of thermal protection devices to the pump motors or for the reduction in the current rating of the pump motor circuit breakers. As a result of the FAA's evaluation which showed that the flush pump motors are not an ignition source, these service instructions are considered to be product improvement in nature and mandatory incorporation is not considered to be necessary. I consider the FAA's action to be completed on this recommendation.

Response Date: 6/2/1986 From: NTSB
Response:
As noted in the Safety Board's letter of May 10, 1985, the FAA's evaluation of the lavatory pump motor systems on transport category airplanes complied with the first part of this recommendation. The FAA's evaluation revealed that a potentially hazardous condition was detected only in McDonnell Douglas DC-9 airplanes of fuselage numbers 855 and prior. As the FAA has issued Airworthiness Directive (AD) 85-07-10 which requires the modification of the toilet flush motor power wire harness in the forward and aft lavatories on these airplanes to eliminate the potential for fire, the second part of this recommendation has now been satisfied. Safety Recommendation A-83-73 has been classified as "Closed--Acceptable Action." Your efforts to improve aviation safety are appreciated.