Appendix B

FAA Press Releases on Boeing 747 and 737 Wiring
November 26, 1997 and April 16, 1998

Proposed FAA directive on 747s calls for inspection of wiring and installation components to prevent electrical spikes or short circuits around fuel systems.

Proposed FAA directive on 737s calls for installation of electricity suppressors, shielding, and separation of wires to prevent electricity jumping to fuel tank wiring.
FOR IMMEDIATE RELEASE
APA 159-97
November 26, 1997
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FAA Orders Changes to Boeing 747 Wiring Systems

WASHINGTON — As part of its ongoing review of Boeing 747 safety issues, the Federal Aviation Administration (FAA) today sent to the Federal Register two Airworthiness Directives (ADs) to further find and fix conditions that might result in potential ignition sources in or near the center fuel tank. These preventive measures are based on recent tests conducted by the National Transportation Safety Board (NTSB) during its investigation of the TWA-800 accident.

The FAA is actively pursuing fuel flammability issues based on the evidence from the accident investigation, technical data provided at October’s FAA/Society of Automotive Engineers (SAE) Transport Fuel Flammability Conference, the 975 pages of comments received from the public and recent NTSB flight tests.

"Although the NTSB has not yet determined the cause of this tragic accident, and we know of no evidence that these parts played any role in the accident, the FAA is ordering these changes to ensure that we take every practical step to ensure the continued safety of the Boeing 747," said FAA Administrator Jane F. Garvey.

In the first AD, the FAA is issuing a Notice of Proposed Rulemaking (NPRM) to enhance the protection of the Fuel Quantity Indication System (FQIS) on Boeing 747s against transient electrical voltage spikes or short circuits. The NPRM AD would require the installation of components to suppress electrical transients and/or the installation of wire shielding and separation of FQIS wiring from other aircraft wiring. The NPRM AD provides for a 90-day comment period and proposes a 12-month compliance deadline for Boeing 747-100, -200 and -300 aircraft.

Recent tests revealed that higher than expected induced voltage spikes were possible when the lower voltage FQIS wiring was placed next to higher voltage, high current wires. The induced voltage is created, through electromagnetic interference (EMI), when the higher current flow is suddenly shut off. Post-accident inspections found metal contamination in some 747 fuel tanks that could lodge in the probes and cause a short circuit. If the contamination is present when the higher induced voltage is also present, a spark could be created in the fuel tank. The sparking raised by a combination of an EMI surge and probe contamination makes it prudent for the FAA to protect the wires against the EMI voltage and other possible shorts in wire bundles. Some newer aircraft already have this protection built in.

In a second AD, the FAA said it is requiring immediate inspection of the scavenge pump wiring on some older Boeing 747 aircraft to detect deterioration of insulating materials in the electrical connectors. The scavenge pump removes leftover fuel from the fuel tank. As part of the NTSB’s investigation, a scavenge pump was removed from an out of service TWA 747 and examined. The inspection revealed that some electrical connectors use a silicone insulating material that is incompatible with the fuel used to cool and lubricate the scavenge pump motor. This results in a gradual breakdown of the insulating material that could cause a fuel leak through the pump connector into the main landing gear wheel well and cause a fire. The AD requires replacement, within 90 days, of the scavenge pumps that are found to have the silicone materials.

The NPRM on the FQIS wiring is estimated to cost $13,200 per aircraft affecting 167 U.S. registered aircraft out of 650 aircraft worldwide. The cost of inspecting the scavenge pump is estimated at $50 for each of the 196 U.S. registered aircraft out of a total of 970 aircraft worldwide. The Boeing 747 fleet has accumulated more than 52 million flight hours and 12 million flights.

The FAA has reviewed 747 service history to determine if there were any unresolved safety issues and has examined every detail of the 747 fuel and electrical systems. As part of its intensive review, the agency issued an AD on Aug. 9, 1996 requiring inspections of Boeing 747 and 757 fuel pumps and a Jan. 21 AD requiring reinspection and repair of the wiring leading to the number 1 and 4 fuel tank booster pumps in the inboard main fuel tanks of 747s produced prior to 1980. All affected U.S. operated 747s were inspected by May 20 and the safety requirements have been met.

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FOR IMMEDIATE RELEASE
APA 43-98
April 16, 1998
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FAA Orders Changes to Boeing 737 Fuel Quantity Indicating Systems

WASHINGTON — As part of a continuing effort to address fuel tank ignition sources, the Federal Aviation Administration (FAA) today will be sending to the Federal Register a proposed Airworthiness Directive (AD), applicable to operators of Boeing 737 aircraft, intended to prevent possible ignition sources of fuel vapors in fuel tanks.

The proposed AD seeks to enhance the protection of the Fuel Quantity Indication System (FQIS) on Boeing 737 aircraft against transient electrical voltage spikes or short circuits. It would require installing transient suppression components, and/or shielding and separation to the fuel system wiring that is routed to the fuel tanks from adjacent wiring. A transient suppression device is a current-protective component that limits amounts of electrical energy.

It also would require installation of flame arrestors and pressure relief valves in the fuel vent system. This would prevent external flames from entering the fuel vent system through the overboard vent in the wing tip. These preventive measures follow a similar AD proposed by FAA last November for Boeing 747-100, -200, and -300 series aircraft. That comment period closes May 27, 1998.

"This is just one of many efforts FAA has underway to reduce or eliminate explosive fuel-air mixtures and potential ignition sources in fuel tanks," said FAA Administrator Jane F. Garvey. "Longer term solutions are being addressed by the Aviation Rulemaking Advisory Committee which is expected to complete its review by July 23."

The Aviation Rulemaking Advisory Committee (ARAC) is comprised of aviation industry experts tasked to help the FAA in its rulemaking efforts.

The AD, published as a Notice of Proposed Rulemaking (NPRM), would affect 1,140 U.S. registered Boeing Model 737-100, -200, -300, -400, and -500 series airplanes. The estimated cost of carrying out the modification of the fuel system wiring is $12,400 per plane. The estimated cost of carrying out the modification of the fuel vent system is $23,280 per airplane. The NPRM proposes a compliance time of 12 months.

FAA's actions are prompted by findings stemming from the TWA 800 accident investigation, and a review of previous fuel tank explosions, including a model 737-300 series aircraft accident on May 11, 1990 in the Philippines. The fuel system wire installation on Model 737-100, -200, -300, -400, and -500 series aircraft is similar to that on the model 747 series aircraft involved in the TWA 800 accident.

Today's directive is consistent with FAA's March 3, 1998 letter to the National Transportation Safety Board (NTSB) summarizing all ongoing actions stemming from the TWA 800 accident. Today's actions are consistent with one of the latest NTSB recommendations issued April 7 regarding surge protection systems.

Interested parties are invited to participate in the making of the proposed rule and have 45 days after publication in the Federal Register to submit comments.

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