

DOCKET NO. SA-228

EXHIBIT NO. 20L

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C.

NATIONAL TRANSPORTATION SAFETY BOARD RECOMMENDATIONS ON
FIRE SUPPRESSION AND DETECTION ON AIRCRAFT

Recommendation Report

Tuesday, June 27, 2006

Log Number 1299

Issue Date 2/10/1981

RIYADH, SAUDI ARABIA SAU

8/19/1980

THE NTSB SENT A U.S. ACCREDITED REPRESENTATIVE AND AC COMPANYING ADVISORS TO PARTICIPATE IN THE INVESTIGATION OF THE SAUDI ARABIAN AIRLINES LOCKHEED L-1011 ACCIDENT AT RIYADH, SAUDI ARABIA, ON AUGUST 19, 1980. THE ACCIDENT INVOLVED AN IN-FLIGHT FIRE IN THE AFT AREA OF THE AIRCRAFT. EVEN THOUGH THE AIRCRAFT WAS LANDED SUCCESSFULLY, THE FIRE SPREAD AND ALL 301 OCCUPANTS DIED AS A RESULT. THE INVESTIGATION, CONDUCTED IN ACCORDANCE WITH THE PROVISIONS OF INTERNATIONAL CIVIL AVIATION ORGANIZATION ANNEX 13, IS CONTINUING AND A REPORT OF THE INVESTIGATION WILL BE ISSUED BY THE KINGDOM OF SAUDI ARABIA UPON COMPLETION. AS PART OF U.S. ASSISTANCE IN THE INVESTIGATION, TESTS AND RESEARCH WERE CONDUCTED AT THE LOCKHEED CALIFORNIA COMPANY AND AT THE FEDERAL AVIATION ADMINISTRATION (FAA) TECHNICAL CENTER, ATLANTIC

Recommendation # A-81-012

**Overall Status
CAA**

**Priority
CLASS I**

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: REEVALUATE THE "CLASS-D" CERTIFICATION OF THE L-1011 C-3 CARGO COMPARTMENT WITH A VIEW TOWARD EITHER CHANGING THE CLASSIFICATION TO "C," REQUIRING DETECTION AND EXTINGUISHING EQUIPMENT, OR CHANGING THE COMPARTMENT LINER MATERIAL TO INSURE CONTAINMENT OF A FIRE OF THE TYPES LIKELY IN THE COMPARTMENT WHILE IN FLIGHT.

FAA

Closed - Acceptable Action

11/2/1982

5/11/1981 Addressee FAA LTR: THE L-1011 IS NOT UNIQUE IN HAVING A LARGE CLASS D TYPE CARGO COMPARTMENT THAT HAS BEEN DEMONSTRATED TO BE IN COMPLIANCE WITH THE REQUIREMENTS OF FAR 25.857(D). FOR THIS REASON, THE FAA DOES NOT BELIEVE SPECIFIC ACTION PERTAINING TO THE L-1011 AS A SPECIAL CASE IS APPROPRIATE. NEITHER DO WE FIND THAT THE LIMITED TESTS CITED BY THE BOARD ARE SUFFICIENT IN THEMSELVES TO JUSTIFY THE RECOMMENDED ACTION. IN THE RESEARCH PROGRAM DISCUSSED UNDER RECOMMENDATION A-81-13, DETECTION, EXTINGUISHMENT, AND FLAMMABILITY OF CARGO COMPARTMENT LINERS WILL BE EVALUATED. SINCE THE INTENT OF THIS RECOMMENDATION IS EMBODIED IN THE FAA RESEARCH DISCUSSED UNDER RECOMMENDATION A-81-13, WE INTEND TO TAKE NO FURTHER ACTION ON SAFETY RECOMMENDATION A-81-12.

9/16/1981 NTSB The Board is of the view that the serious circumstances of the accident justify that the L-1011 Class D cargo compartment be examined specifically during the overall Class D compartment evaluation program. The L-1011 cargo compartment fire test, conducted as part of the subject investigation, although preliminary and limited, does indicate considerable cause for concern regarding the compliance of the compartment with the intent to FAR Section 25.857(d). These specific concerns regarding the L-1011 and the adequacy of existing regulations need to be resolved conclusively and rapidly as part of the FAA's overall test program. The research program initiated by the FAA, in response to A-81-13 will not fully satisfy the intent of A-81-12. We, therefore, request the FAA to reconsider its actions in response to A-81-12 which we are maintaining in an "Open--Unacceptable Action" status.

5/11/1982 Addressee FAA LTR: WE FOUND THAT BY THE INSTALLATION OF THE FIBERGLASS CEILING LINER IN LIEU OF THE STANDARD C-2 NOMEX FABRIC LINER, FIRE CONTAINMENT WAS IMPROVED TO SUCH A GREAT EXTENT THAT A RETROFIT UPGRADING THE FLEET WITH THE FIBERGLASS APPEARED TO BE A BENEFICIAL AND PRUDENT ACTION. AFTER DETERMINING THAT ALL U.S. CARRIERS OPERATING L-1011'S WERE COMMITTED TO INSTALLING THE FIBERGLASS CEILING LINERS IN ACCORDANCE WITH THE APPROVED LOCKHEED SERVICE BULLETIN, WE ISSUED A TELEGRAPHIC MESSAGE TO ALL FOREIGN AIRWORTHINESS AUTHORITIES CONCERNED WITH THE L-1011, INFORMING THEM OF THE SITUATION AND STRONGLY ENCOURAGING COMPLIANCE WITH THE SERVICE

11/2/1982 NTSB The Board is pleased with Lockheed and FAA efforts to develop and install a cargo compartment liner material which would improve fire containment if an in-flight fire developed within the C-3 cargo compartment of a L-1011 airplane. We have been informed that all U.S. carriers operating L-1011's have installed or are intending to install the new fiberglass ceiling liners in accordance with the approved Lockheed service bulletin. In view of these actions, Safety Recommendation No. A-81-12 is now classified in a "Closed--Acceptable Action" status.

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Tuesday, June 27, 2006

Recommendation # A-81-013

**Overall Status
CAA**

**Priority
CLASS II**

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: REVIEW THE CERTIFICATION OF ALL BAGGAGE/CARGO COMPARTMENTS (OVER 500 CU. FT.) IN THE "D" CLASSIFICATION TO INSURE THAT THE INTENT OF 14 CFR 25.857(D) IS MET.

FAA

Closed - Acceptable Action

6/25/1986

5/11/1981 Addressee FAA LTR: THE SEVERITY AND PROGRESSION OF THE SAUDI ARABIAN FIRE CAUSED THE FAA TO IMMEDIATELY QUESTION THE EFFICACY OF THE CLASS D FIRE CONTAINMENT CONCEPT. IMMEDIATELY AFTER THE ACCIDENT, THE FAA BEGAN FORMULATING A RESEARCH PROGRAM, TO BE ACCOMPLISHED AT THE TECHNICAL CENTER, TO CONDUCT A COMPREHENSIVE REEVALUATION OF THE CONCEPT AND REGULATORY STANDARDS FOR CLASS D CARGO COMPARTMENTS. ON JANUARY 15, 1981, THE OFFICE OF AVIATION STANDARDS FORMALLY REQUESTED THE ESTABLISHMENT OF A RESEARCH

9/16/1981 NTSB We are pleased to note that the FAA has initiated a research program for a comprehensive reevaluation of the concept and regulatory standards for Class D cargo compartments. Our staff is periodically in contact with the research staff at the FAA's Research Center. Because of our concerns stemming from our involvement in this accident, it is necessary for the Safety Board staff to maintain close liaison with the FAA's staff at the Research Center and to monitor the progress and test results of the program. The FAA's cooperation in this matter is appreciated. Hopefully, the timely completion of the research and testing will resolve the questions raised by these recommendations. A-81-13 is classified in an "Open--Acceptable Action" status.

5/11/1982 Addressee FAA LTR: WE ARE PLEASED THAT THE SAFETY BOARD CONCURS IN OUR RESEARCH PROGRAM FOR A COMPREHENSIVE REEVALUATION OF THE CONCEPT AND REGULATORY STANDARDS FOR THE CLASS D CARGO COMPARTMENT. WE ALSO UNDERSTAND AND APPRECIATE THE NEED FOR THE SAFETY BOARD'S STAFF TO BE AWARE AND CONVERSANT AS TO THE PROGRESS AND TEST RESULTS OF THE PROGRAM. WE KNOW OF NO IMPEDIMENTS TO FULL COOPERATION ON OUR PART IN ALLOWING THE BOARD'S STAFF TO MAINTAIN CLOSE LIAISON WITH THE FAA'S STAFF AT THE TECHNICAL CENTER AND TO MONITOR THE PROGRESS AND TEST RESULTS OF THE

11/2/1982 NTSB As stated in our letter of September 16, 1981, we are pleased that the FAA has initiated a research program for a comprehensive reevaluation of the concept and regulatory standards for "Class D" cargo compartments. The Board staff has had no impediments in monitoring the research at the FAA's Research Center, and we are awaiting receipt of the research results and the nature of appropriate remedial action the FAA intends to take. Safety Recommendation No. A-81-13 will remain classified in an "Open--Acceptable Action" status.

12/2/1985 Addressee A REVIEW OF THE FAA'S FILES DISCLOSED THAT THE BOARD WAS NOT IN RECEIPT OF A REGULATORY ACTION INITIATED BY THE FAA. ENCLOSED FOR THE BOARD'S INFORMATION IS A COPY OF A NPRM, DOCKET NO.24185, NOTICE NO. 84-11 THAT WAS ISSUED ON MAY 7, 1984, AND PUBLISHED IN THE FEDERAL REGISTER ON AUGUST 8, 1984. THE NOTICE PROPOSES TO UPGRADE THE FIRE SAFETY STANDARDS FOR CARGO OR BAGGAGE COMPARTMENTS IN TRANSPORT CATEGORY AIRPLANES BY ESTABLISHING NEW FIRE TEST CRITERIA AND BY LIMITING THE VOLUME OF CLASS D COMPARTMENTS. THESE PROPOSALS ARE THE RESULT OF RESEARCH AND FIRE TESTING AND ARE INTENDED TO INCREASE AIRCRAFT FIRE SAFETY. THE PUBLIC COMMENT PERIOD FOR THIS NPRM WAS EXTENDED TO JUNE 3, 1985, AND THE COMMENTS RECEIVED ARE BEING EVALUATED. I ANTICIPATE THAT A FINAL RULE, IF ADOPTED, WILL BE ISSUED IN THE 2ND QUARTER OF CY86.

12/10/1985 NTSB We were informed that the FAA had initiated a research program for a comprehensive reevaluation of the concept and regulatory standards for Class "D" cargo compartments and that the Safety Board would be kept advised of the FAA's research findings. For our information and public docket record we would appreciate being apprised of the research results and the nature of the action taken by the FAA. This recommendation remains in an "Open--Acceptable Action" status.

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2/18/1986 NTSB

The Safety Board commented on the FAA's Notice of Proposed Rulemaking (NPRM), Docket No. 24185: Notice No. 84-11 in our letter of October 9, 1984. In summary, although the new test method described in the NPRM is adequate to assure that compartment liners will prevent flame penetration, there are hazards which are not addressed by the existing regulations nor by this NPRM. Some of the hazards are: (1) A fire in a nearly empty class D compartment can burn at the same rate as that which is prescribed in the new test method but beyond the 5 minute safe test limit required of the compartment liner, (2) If the compartment liner is damaged (punctured or cracked), the oxygen restriction feature protecting class D compartments will be negated, and (3) If there are valves for ventilation control, as was the case in the Saudi Airlines L-1011, which remain open because a fire was not detected, a fire could receive sufficient oxygen to burn through the compartment liner. Additionally, the Safety Board continues to believe that a fire detection system should be required for class D cargo compartments so that the flightcrews will be alerted to the existence of a fire.

As the FAA anticipates that a final rule on this subject may be adopted by the 2nd quarter of CY86, the Safety Board will withhold further comment until it has the opportunity to review the adopted regulation. Pending receipt of information as to the final result of the FAA rulemaking effort, Safety Recommendation A-81-13 has been classified as "Open--Acceptable Action."

6/25/1986 Addressee

ENCLOSED FOR THE BOARD'S INFORMATION IS A COPY OF A FINAL RULE, DOCKET NUMBER 24185; AMENDMENT NO. 25-60, THAT WAS ISSUED ON MAY 9, 1986, AND PUBLISHED IN THE FEDERAL REGISTER ON MAY 16, 1986. THIS AMENDMENT BECAME EFFECTIVE ON JUNE 16, 1986, AND UPGRADES THE FIRE SAFETY STANDARDS FOR CARGO OR BAGGAGE COMPARTMENTS IN TRANSPORT CATEGORY AIRPLANES BY ESTABLISHING NEW FIRE TEST CRITERIA AND BY LIMITING THE VOLUME OF CLASS D COMPARTMENTS. THIS AMENDMENT IS THE RESULT OF RESEARCH AND FIRE TESTING AND WILL INCREASE AIRPLANE FIRE SAFETY.

8/11/1986 NTSB

The Safety Board has reviewed Amendment No. 25-60, which upgrades the fire safety standards for cargo or baggage compartments in transport category airplanes by establishing new fire test criteria and by limiting the volume of Class D compartments. The Safety Board finds that the FAA's actions, of reviewing the certification requirements for cargo/baggage compartments and issuing this amendment, comply with the intent of Safety Recommendation A-81-13. Therefore, Safety Recommendation A-81-13 has been classified as "Closed--Acceptable Action."

Recommendation Report

Tuesday, June 27, 2006

Log Number 2101B

Issue Date 10/24/1988

NASHVILLE TN

2/3/1988

ON FEBRUARY 3, 1988, AMERICAN AIRLINES FLIGHT 132, A MCDONNELL DOUGLAS DC-9-83, DEPARTED DALLAS/FORT WORTH INTERNATIONAL AIRPORT, TEXAS, FOR NASHVILLE METROPOLITAN AIRPORT, TENNESSEE. IN ADDITION TO THE PASSENGER LUGGAGE IN THE MIDCARGO COMPARTMENT, FLIGHT 132 WAS LOADED WITH A 104 POUND FIBER DRUM OF TEXTILE TREATMENT CHEMICALS. UNDECLARED AND IMPROPERLY PACKAGED HAZARDOUS MATERIALS INSIDE THE FIBER DRUM INCLUDED 5 GALLONS OF HYDROGEN PEROXIDE SOLUTION AND 25 POUNDS OF A SODIUM ORTHOSILICATE-BASED MIXTURE. WHILE IN FLIGHT, A FLIGHT ATTENDANT AND A DEADHEADING FIRST OFFICER NOTIFIED THE COCKPIT CREW OF SMOKE IN THE PASSENGER CABIN. THE PASSENGER CABIN FLOOR ABOVE THE CARGO COMPARTMENT WAS HOT AND SOFT, AND THE FLIGHT ATTENDANTS HAD TO MOVE PASSENGERS FROM THE AFFECTED AREA. THE CAPTAIN, WHO WAS AWARE OF A MECHANICAL DISCREPANCY WITH THE AUXILIARY POWER UNIT (APU) ON AN EARLIER FLIGHT WHICH RESULTED IN IN-FLIGHT FUMES, WAS SKEPTICAL ABOUT THE FLIGHT ATTENDANT'S REPORT OF SMOKE. NO IN-FLIGHT EMERGENCY WAS DECLARED. AFTER LANDING, THE CAPTAIN NOTIFIED NASHVILLE GROUND CONTROL ABOUT THE POSSIBILITY OF FIRE IN THE CARGO COMPARTMENT, AND HE REQUESTED FIRE EQUIPMENT. THE FLIGHT ATTENDANTS THEN INITIATED PROCEDURES TO EVACUATE THE AIRPLANE ON THE TAXIWAY. ABOUT 2 MINUTES 8 SECONDS AFTER THE PLANE LANDED, THE 120 PASSENGERS AND 6 CREWMEMBERS BEGAN EVACUATING THE AIRPLANE. AFTER THE PLANE WAS EVACUATED, CRASH/FIRE/RESCUE PERSONNEL EXTINGUISHED THE FIRE IN THE CARGO COMPARTMENT.

Recommendation # A-88-122

**Overall Status
CUA**

**Priority
CLASS II**

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: REQUIRE FIRE/SMOKE DETECTION SYSTEMS FOR ALL CLASS D CARGO COMPARTMENTS.

FAA

Closed - Unacceptable Action

8/10/1993

1/5/1989 Addressee

THE FAA IS CONSIDERING THE ISSUANCE OF A NOTICE OF PROPOSED RULEMAKING (NPRM) PROPOSING TO AMEND 14 CFR PARTS 25, 121, AND 135 TO REQUIRE FIRE AND SMOKE DETECTION SYSTEMS AND A FIRE EXTINGUISHING SYSTEM FOR ALL CLASS D CARGO COMPARTMENTS THAT ARE MORE THAN 200 CUBIC FEET IN VOLUME. THE FAA BELIEVES THAT THE CURRENT REQUIREMENTS OF 14 CFR PART 25, COMBINED WITH THE RECENTLY AMENDED CARGO COMPARTMENT LINER AND CARGO CONTAINER REQUIREMENTS OF 14 CFR 25.855, PROVIDE AN ACCEPTABLE LEVEL OF SAFETY FOR CARGO COMPARTMENTS OF 200 CUBIC FEET OR LESS IN VOLUME. ADDITIONALLY, THE FAA HAS REVIEWED ALL OF THE COMMENTS TO NOTICE 87-11 WHICH PROPOSES TO MAKE THE RECENT CHANGES TO 14 CFR 25.855 APPLICABLE TO 14 CFR PARTS 121 AND 135. I WILL PROVIDE THE BOARD WITH COPIES OF ANY DOCUMENTS WHICH ARE ISSUED.

7/20/1990 NTSB

Safety Recommendation A-88-122 calls for fire/smoke detection systems in Class D cargo compartments, and Safety Recommendation A-88-123 states that these compartments should have fire extinguishing systems. The Safety Board understands that the FAA has drafted a notice of proposed rulemaking (NPRM) which includes fire, smoke, and thermal protection of aircraft cargo compartments. Although we are concerned about the FAA's position that these systems are not required in compartments of less than 200 cubic feet, Safety Recommendations A-88-122 and -123 will be held in an "Open--Acceptable Action" status pending our review of the NPRM when it is published.

4/19/1993 NTSB

We classified Safety Recommendations A-88-122 through -124 as "Open--Acceptable Action" and Safety Recommendation A-88-127 as "Open--Unacceptable Action" on July 20, 1990, based on the FAA's letter of January 5, 1989. Our records show that we have not received any further response from the FAA regarding these recommendations. We would appreciate being informed about efforts that have been or are being made to implement these safety recommendations. Copies of the recommendation letter and related correspondence are enclosed for your information.

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- 8/10/1993 Addressee THE FAA INITIATED A RULEMAKING ACTION WHICH ADDRESSED THE INTENT OF THE RECOMMENDATION. THE PRELIMINARY ECONOMIC ANALYSIS INDICATED THAT THE COST OF THE COMPLIANCE WOULD EXCEED \$350 MILLION MAKING THE PROPOSAL A MAJOR RULE AS DEFINED IN EXECUTIVE ORDER 12291. TWO BENEFITS ANALYSES WERE CONDUCTED WITH THE RESULTS BEING COST-TO-BENEFIT RATIOS OF 6.2 TO 1.0 AND 3.5 TO 1.0. ALSO, THE PROPOSED RULE WOULD NOT HAVE PROVIDED A SIGNIFICANT DEGREE OF PROTECTION TO THE OCCUPANTS FROM THE EXTREMELY SEVERE FIRE THAT RESULTED FROM THE ILLEGAL SHIPMENT OF POWERFUL OXIDIZERS. THE FAA DETERMINED THAT THE RULEMAKING ACTION ORIGINALLY ANNOUNCED WILL BE TERMINATED. THE FAA PLANS NO FURTHER ACTION ON THE SAFETY
- 10/14/1999 NTSB ON FEBRUARY 1, 1991, THE BOARD INVESTIGATED ANOTHER IN-FLIGHT FIRE IN A CLASS D CARGO COMPARTMENT. THE USAIR DC-9 WAS EN ROUTE TO GREENSBORO, NORTH CAROLINA, FROM CHARLOTTE, NORTH CAROLINA. ALTHOUGH A FLIGHT ATTENDANT SMELLED SMOKE AS THE AIRPLANE APPROACHED A GATE AT GREENSBORO, THE FIRE HAD GONE UNDETECTED UNTIL THE GROUND CREW OPENED THE CARGO COMPARTMENT DOOR AT THE DESTINATION GATE. THE BOARD CONTINUES TO BELIEVE THAT A FIRE SHOULD NOT BE ALLOWED TO PERSIST IN ANY STATE OF INTENSITY IN AN AIRPLANE WITHOUT THE KNOWLEDGE OF THE FLIGHTCREW. FURTHER, THE BOARD IS CONCERNED THAT THE FAA FAILED TO CONSIDER THE EFFECTS OF HAZARDOUS MATERIALS (DECLARED OR UNDECLARED) IN CARGO COMPARTMENT FIRES WHEN IT APPROVED BURN-THROUGH TEST REQUIREMENTS FOR CARGO COMPARTMENT LINERS IN 1986 IN LIEU OF FIRE DETECTION AND EXTINGUISHMENT SYSTEMS. BECAUSE THE RULEMAKING ACTION ORIGINALLY ANNOUNCED WILL BE TERMINATED AND THE FAA PLANS NO FURTHER ACTION, RECOMMENDATIONS A-88-122 AND-123 ARE CLASSIFIED "CLOSED--UNACCEPTABLE ACTION."

Recommendation # A-88-123

Overall Status
CUA

Priority
CLASS II

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: REQUIRE A FIRE EXTINGUISHMENT SYSTEM FOR ALL CLASS D CARGO COMPARTMENTS.

- FAA Closed - Unacceptable Action 8/10/1993
- 1/5/1989 Addressee THE FAA IS CONSIDERING THE ISSUANCE OF A NOTICE OF PROPOSED RULEMAKING (NPRM) PROPOSING TO AMEND 14 CFR PARTS 25, 121, AND 135 TO REQUIRE FIRE AND SMOKE DETECTION SYSTEMS AND A FIRE EXTINGUISHING SYSTEM FOR ALL CLASS D CARGO COMPARTMENTS THAT ARE MORE THAN 200 CUBIC FEET IN VOLUME. THE FAA BELIEVES THAT THE CURRENT REQUIREMENTS OF 14 CFR PART 25, COMBINED WITH THE RECENTLY AMENDED CARGO COMPARTMENT LINER AND CARGO CONTAINER REQUIREMENTS OF 14 CFR 25.855, PROVIDE AN ACCEPTABLE LEVEL OF SAFETY FOR CARGO COMPARTMENTS OF 200 CUBIC FEET OR LESS IN VOLUME. ADDITIONALLY, THE FAA HAS REVIEWED ALL OF THE COMMENTS TO NOTICE 87-11 WHICH PROPOSES TO MAKE THE RECENT CHANGES TO 14 CFR 25.855 APPLICABLE TO 14 CFR PARTS 121 AND 135. I WILL PROVIDE THE BOARD WITH COPIES OF ANY DOCUMENTS WHICH ARE ISSUED.
- 7/20/1990 NTSB Safety Recommendation A-88-122 calls for fire/smoke detection systems in Class D cargo compartments, and Safety Recommendation A-88-123 states that these compartments should have fire extinguishing systems. The Safety Board understands that the FAA has drafted a notice of proposed rulemaking (NPRM) which includes fire, smoke, and thermal protection of aircraft cargo compartments. Although we are concerned about the FAA's position that these systems are not required in compartments of less than 200 cubic feet, Safety Recommendations A-88-122 and -123 will be held in an "Open--Acceptable Action" status pending our review of the NPRM when it is published.
- 4/19/1993 NTSB We classified Safety Recommendations A-88-122 through -124 as "Open--Acceptable Action" and Safety Recommendation A-88-127 as "Open--Unacceptable Action" on July 20, 1990, based on the FAA's letter of January 5, 1989. Our records show that we have not received any further response from the FAA regarding these recommendations. We would appreciate being informed about efforts that have been or are being made to implement these safety recommendations. Copies of the recommendation letter and related correspondence are enclosed for your information.

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- 8/10/1993 Addressee THE FAA INITIATED A RULEMAKING ACTION WHICH ADDRESSED THE INTENT OF THE RECOMMENDATION. THE PRELIMINARY ECONOMIC ANALYSIS INDICATED THAT THE COST OF THE COMPLIANCE WOULD EXCEED \$350 MILLION MAKING THE PROPOSAL A MAJOR RULE AS DEFINED IN EXECUTIVE ORDER 12291. TWO BENEFITS ANALYSES WERE CONDUCTED WITH THE RESULTS BEING COST-TO-BENEFIT RATIOS OF 6.2 TO 1.0 AND 3.5 TO 1.0. ALSO, THE PROPOSED RULE WOULD NOT HAVE PROVIDED A SIGNIFICANT DEGREE OF PROTECTION TO THE OCCUPANTS FROM THE EXTREMELY SEVERE FIRE THAT RESULTED FROM THE ILLEGAL SHIPMENT OF POWERFUL OXIDIZERS. THE FAA DETERMINED THAT THE RULEMAKING ACTION ORIGINALLY ANNOUNCED WILL BE TERMINATED. THE FAA PLANS NO FURTHER ACTION ON THE RECOMMENDATION.
- 10/14/1993 NTSB ON FEBRUARY 1, 1991, THE BOARD INVESTIGATED ANOTHER IN-FLIGHT FIRE IN A CLASS D CARGO COMPARTMENT. THE USAIR DC-9 WAS EN ROUTE TO GREENSBORO, NORTH CAROLINA, FROM CHARLOTTE, NORTH CAROLINA. ALTHOUGH A FLIGHT ATTENDANT SMELLED SMOKE AS THE AIRPLANE APPROACHED A GATE AT GREENSBORO, THE FIRE HAD GONE UNDETECTED UNTIL THE GROUND CREW OPENED THE CARGO COMPARTMENT DOOR AT THE DESTINATION GATE. THE BOARD CONTINUES TO BELIEVE THAT A FIRE SHOULD NOT BE ALLOWED TO PERSIST IN ANY STATE OF INTENSITY IN AN AIRPLANE WITHOUT THE KNOWLEDGE OF THE FLIGHTCREW. FURTHER, THE BOARD IS CONCERNED THAT THE FAA FAILED TO CONSIDER THE EFFECTS OF HAZARDOUS MATERIALS (DECLARED OR UNDECLARED) IN CARGO COMPARTMENT FIRES WHEN IT APPROVED BURN-THROUGH TEST REQUIREMENTS FOR CARGO COMPARTMENT LINERS IN 1986 IN LIEU OF FIRE DETECTION AND EXTINGUISHMENT SYSTEMS. BECAUSE THE RULEMAKING ACTION ORIGINALLY ANNOUNCED WILL BE TERMINATED AND THE FAA PLANS NO FURTHER ACTION, RECOMMENDATIONS A-88-122 AND-123 ARE CLASSIFIED "CLOSED--UNACCEPTABLE ACTION."

Recommendation # A-88-125

Overall Status
CUA

Priority
CLASS II

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: REVIEW THE CERTIFICATION OF ALL TYPES OF CARGO COMPARTMENTS TO IDENTIFY ANY ALUMINUM OR OTHER COMPONENTS THAT FAIL TO MEET THERMAL PROTECTION REQUIREMENTS AT LEAST EQUAL TO CARGO COMPARTMENT LINER THERMAL PROTECTION REQUIREMENTS. REQUIRE THAT ALL SAFETY DEFICIENCIES BE CORRECTED.

FAA Closed - Unacceptable Action 1/5/1989

1/5/1989 Addressee THE FAA IS CONSIDERING THE ISSUANCE OF A NOTICE OF PROPOSED RULEMAKING (NPRM) PROPOSING TO AMEND 14 CFR PARTS 25, 121, AND 135 TO REQUIRE FIRE AND SMOKE DETECTION SYSTEMS AND A FIRE EXTINGUISHING SYSTEM FOR ALL CLASS D CARGO COMPARTMENTS THAT ARE MORE THAN 200 CUBIC FEET IN VOLUME. THE FAA BELIEVES THAT CURRENT REQUIREMENTS OF 14 CFR PART 25, COMBINED WITH THE RECENTLY AMENDED CARGO COMPARTMENT LINER AND CARGO CONTAINER REQUIREMENTS OF 14 CFR 25.855, PROVIDE AN ACCEPTABLE LEVEL OF SAFETY FOR CARGO COMPARTMENTS OF 200 CUBIC FEET OR LESS IN VOLUME. ADDITIONALLY, THE FAA HAS REVIEWED ALL OF THE COMMENTS TO NOTICE-87-11 WHICH PROPOSES TO MAKE THE RECENT CHANGES TO 14 CFR 25.855 APPLICABLE TO 14 CFR PARTS 121 AND 135. I WILL PROVIDE THE BOARD WITH A COPY OF THE FINAL REGULATORY DOCUMENT AS SOON AS IT IS ISSUED.

1/29/1990 Addressee (SUMMARIZED) THE FAA CONDUCTED AN EXTENSIVE FIRE TEST PROGRAM TO DETERMINE THE INTENSITY OF FIRES LIKELY TO OCCUR AND THE CAPABILITY OF VARIOUS LINER MATERIALS, INCLUDING RIGID FIBERGLASS AND ALUMINUM, TO RESIST FLAME PENETRATION. AS A RESULT OF THIS TESTING, AMENDMENT 25-60 WAS ADOPTED TO ESTABLISH NEW FLAME PENETRATION STANDARDS FOR SUCH LINERS. SUBSEQUENTLY, AMENDMENTS 121-202 AND 135-31 WERE ISSUED ON FEBRUARY 10, 1989, TO REQUIRE THAT TRANSPORT CATEGORY AIRPLANES MEET NEW SIMILAR STANDARDS IF THEY ARE USED IN AIR CARRIER SERVICE AFTER MARCH 20, 1991. LINERS CONSTRUCTED OF RIGID FIBERGLASS WERE SHOWN TO INVARIABLY MEET NEW STANDARDS. AMENDMENTS 121-202 AND 135-31, THEREFORE, PERMIT THE CONTINUED USE OF SUCH LINERS WITHOUT FURTHER TESTING. THE USE OF ALUMINUM IN CERTAIN PORTING OF THE CARGO COMPARTMENT LINERS WAS NOT A FACTOR IN THIS INCIDENT. ALTHOUGH ALUMINUM LINERS DID NOT MEET THE NEW STANDARD, THEY ARE NOT CONSIDERED TO BE A SAFETY DEFICIENCY. THEREFORE, THESE AMENDMENTS ALLOW THE CONTINUED USE OF ALUMINUM LINERS APPROVED PRIOR TO MARCH 20, 1989. LINERS CONSTRUCTED OF ANY MATERIAL OTHER THAN RIGID FIBERGLASS MUST BE SHOWN BY TESTING TO MEET THE NEW STANDARDS OF AMENDMENT 25-60. I CONSIDER THE FAA'S ACTION TO BE COMPLETED, AND I PLAN NO FURTHER ACTION.

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7/20/1990 NTSB

Safety Recommendation A-88-125 asks for a review of the certification of all types of cargo compartments to identify any aluminum or other components that fail to meet thermal protection requirements at least equal to cargo compartment liner thermal protection requirements, and that all safety deficiencies be corrected. The Safety Board commends the FAA for requiring cargo compartments to have the thermal protection at least equal to that of the fiberglass liner material. However, the FAA's January 29, 1990, response to this safety recommendation incorrectly states that "The use of aluminum in certain portions of the cargo compartment liners was not a factor" in the hazardous materials incident that was the basis for formulating this safety recommendation. Contrary to the FAA statement, aluminum liner straps and light fixtures were among the components of the cargo compartment that melted, preventing containment of the thermal damage. This accident proved that the use of aluminum in liner systems may be a hazard. Regarding aluminum liners approved before March 20, 1989, it must be noted that the liners are being utilized in the current generation of aircraft, which are based on existing airframes and use many previously certified parts. Examples include the McDonnell Douglas MD-11 and -90, the Boeing 737 and 767 variants, and the Airbus A-300, -310, -320, and -340. These aircraft will probably be in service for at least another 20 years using these liners. The Safety Board believes that replacement should be made over a period of time, which would not place undue pressure on the airlines. However, we strongly believe that these liners should be removed from service because they do not provide the required protection. Because the FAA's January 29, 1990, response states that no further action is planned, Safety Recommendation A-88-125 has been classified as "Closed--Unacceptable Action."

Recommendation # A-88-127

Overall Status
CUA

Priority
CLASS II

THE NTSB RECOMMENDS THAT THE FEDERAL AVIATION ADMINISTRATION: CONSIDER THE EFFECTS OF AUTHORIZED HAZARDOUS MATERIALS CARGO IN FIRES FOR ALL TYPES OF CARGO COMPARTMENTS, AND REQUIRE APPROPRIATE SAFETY SYSTEMS TO PROTECT THE AIRCRAFT AND OCCUPANTS.

FAA

Closed - Unacceptable Action

3/28/1994

1/5/1989 Addressee

THE FAA IS CONSIDERING THE ISSUANCE OF A NOTICE OF PROPOSED RULEMAKING (NPRM) PROPOSING TO AMEND 14 CFR PARTS 25, 121, AND 135 TO REQUIRE FIRE AND SMOKE DETECTION SYSTEMS AND A FIRE EXTINGUISHING SYSTEM FOR ALL CLASS D CARGO COMPARTMENTS THAT ARE MORE THAN 200 CUBIC FEET IN VOLUME. THE FAA BELIEVES THAT THE CURRENT REQUIREMENTS OF 14 CFR PART 25, COMBINED WITH THE RECENTLY AMENDED CARGO COMPARTMENT LINER AND CARGO CONTAINER REQUIREMENTS OF 14 CFR 25.855, PROVIDE AN ACCEPTABLE LEVEL OF SAFETY FOR CARGO COMPARTMENTS OF 200 CUBIC FEET OR LESS IN VOLUME. ADDITIONALLY, THE FAA HAS REVIEWED ALL OF THE COMMENTS TO NOTICE 87-11 WHICH PROPOSES TO MAKE THE RECENT CHANGES TO 14 CFR 25.855 APPLICABLE TO 14 CFR PARTS 121 AND 135. SERVICE INCIDENTS OF FIRE INVOLVING AUTHORIZED AND PROPERLY PACKAGED HAZARDOUS MATERIALS DO NOT INDICATE THAT COMPLIANCE WITH THIS SAFETY RECOMMENDATION IS AS CRITICAL AS THE FAA'S ONGOING FIRE SAFETY EFFORTS. THE FAA'S ACTION IN RESPONSE TO THIS SAFETY RECOMMENDATION WOULD DEPEND ON THE FIRE PROTECTION CAPABILITIES OF THE CARGO COMPARTMENTS. THE FAA WILL RESPOND TO THE ISSUES OF THIS SAFETY RECOMMENDATION AS SOON AS A DETERMINATION HAS BEEN MADE REGARDING THE ISSUANCE OF ANY REGULATORY DOCUMENT.

7/20/1990 NTSB

Safety Recommendation A-88-127 asks the FAA to consider the effects of authorized hazardous materials in fires for all types of cargo compartments and to require appropriate safety measures to protect the aircraft and its occupants. The Safety Board noted on page 27 of the Nashville accident report (NTSB/HZM-88/02) that the FAA did not consider the effects of hazardous materials in the fire safety standards that became effective June 16, 1986. To assert that a problem does not exist, simply because there is not a history of problems, is inappropriate. The Safety Board believes that authorized hazardous materials must be considered in cargo compartment emergency preparations. Although the FAA has improved the capabilities of cargo compartments to withstand extreme heat, which is applicable to Safety Recommendation A-88-125, this improvement does not apply to the intent of Safety Recommendation A-88-127. The FAA has not shown that consideration has been given to amounts of allowable hazardous materials, or that compartment evaluations have empirically demonstrated that the safety systems proposed would maintain compartment integrity. We will hold Safety Recommendation A-88-127 in an "Open--Unacceptable Action" status pending our review of any FAA regulatory activity on this issue.

Recommendation Report

Tuesday, June 27, 2006

4/19/1993 NTSB

OUR RECORDS SHOW THAT WE HAVE NOT RECEIVED ANY FURTHER RESPONSE FROM THE FAA REGARDING THESE RECOMMENDATIONS. WE WOULD APPRECIATE BEING INFORMED ABOUT EFFORTS THAT HAVE BEEN OR ARE BEING MADE TO IMPLEMENT THESE RECOMMENDATIONS.

3/17/1994 NTSB

TO DATE, WE HAVE NOT RECEIVED A RESPONSE. APPARENTLY, THE FAA HAS TAKEN NO POSITIVE ACTION ON THIS RECOMMENDATION SINCE IT WAS ISSUED ON OCTOBER 24, 1988. THEREFORE, WE HAVE CLASSIFIED RECOMMENDATION A-88-127 "CLOSED--UNACCEPTABLE ACTION."

Recommendation Report

Tuesday, June 27, 2006

Log Number 2654
Issue Date 9/9/1997

MIAMI FL

5/11/1996

ON 5/11/96, ABOUT 1415 EASTERN DAYLIGHT TIME, A MCDONNELL DOUGLAS DC-9-32 CRASHED INTO THE EVERGLADES SWAMP SHORTLY AFTER TAKEOFF FROM MIAMI INTERNATIONAL AIRPORT, MIAMI FLORIDA, THE AIRPLANE, N904VJ, WAS OPERATED BY VALUJET AIRLINES, INC., AS VALUJET FLIGHT FLIGHT 592. BOTH PILOTS, THE THREE FLIGHT ATTENDANTS, AND ALL 105 PASSENGERS WERE KILLED. BEFORE THE ACCIDENT, THE FLIGHTCREW REPORTED TO AIR TRAFFIC CONTROL THAT IT WAS EXPERIENCING SMOKE IN THE CABIN AND COCKPIT. VISUAL METEOROLOGICAL CONDITIONS EXISTED IN THE MIAMI AREA AT THE TIME OF THE TAKEOFF. THE DESTINATION OF THE FLIGHT WAS HARTSFIELD INTERNATIONAL AIRPORT, ATLANTA, GEORGIA. FLIGHT 592 WAS ON AN INSTRUMENT FLIGHT RULES FLIGHT PLAN.

Recommendation # A-97-056

Overall Status
CAA

Priority

THE NTSB RECOMMENDS THAT THE FAA: EXPEDITE FINAL RULEMAKING TO REQUIRE SMOKE DETECTION & FIRE PRESSION SYSTEMS FOR ALL CLASS D CARGO COMPARTMENTS.

FAA

Closed - Acceptable Action

8/13/1998

2/26/1998 Addressee

ON 2/12/98, THE FAA ISSUED ITS FINAL RULE TO UPGRADE THE SAFETY STANDARDS FOR CARGO OR BAGGAGE COMPARTMENTS IN CERTAIN TRANSPORT- CATEGORY AIRPLANES BY ELIMINATING CLASS D COMPARTMENTS AS AN OPTION FOR FUTURE TYPE CERTIFICATION. COMPARTMENTS THAT CAN NO LONGER BE DESIGNATED AS CLASS D MUST MEET THE STANDARDS FOR CLASS C OR CLASS E COMPARTMENTS, AS APPLICABLE. THE CLASS D COMPARTMENTS IN CERTAIN TRANSPORT-CATEGORY AIRPLANES MANUFACTURED UNDER EXISTING TYPE CERTIFICATES & USED IN PASSENGER SERVICE MUST MEET THE FIRE OR SMOKE DETECTION & FIRE SUPPRESSION STANDARDS FOR CLASS C COMPARTMENT BY EARLY 2001 FOR USE IN AIR CARRIER OR MOST OTHER COMMERCIAL SERVICE. I CONSIDER THE FAA'S ACTION TO BE COMPLETED IN RESPONSE TO THIS SAFETY RECOMMENDATION, & I PLAN NO FURTHER ACTION.

8/13/1998 NTSB

A-97-56 ASKED THE FAA TO EXPEDITE FINAL RULEMAKING TO REQUIRE SMOKE DETECTION & FIRE SUPPRESSION SYSTEMS FOR ALL CLASS D CARGO COMPARTMENTS. BASED ON THE FAA'S ACTIONS, A-97-56 IS CLASSIFIED "CLOSED--ACCEPTABLE ACTION."

Recommendation Report

Tuesday, June 27, 2006

Log Number 2712A

Issue Date 8/12/1998

NEWBURGH NY

9/5/1996

ABOUT 0554 EASTERN DAYLIGHT TIME, ON 9/5/96, A DOUGLAS DC-10-10CF, N68055, OPERATED BY THE FEDERAL EXPRESS CORPORATION (FEDEX) AT FLIGHT 1406, MADE AN EMERGENCY LANDING AT STEWART INTERNATIONAL AIRPORT, NEWBURGH, NEW YORK, AFTER THE FLIGHTCREW DETERMINED THAT THERE WAS SMOKE IN THE CABIN CARGO COMPARTMENT. THE FLIGHT WAS OPERATING UNDER THE PROVISIONS OF TITLE 14 CODE OF FEDERAL REGULATIONS (CFR) PART 121 AS A CARGO FLIGHT FROM MEMPHIS, TENNESSEE, TO BOSTON, MASSACHUSETTS. THREE CREWMEMBERS AND TWO NONREVENUE PASSENGERS WERE ABOARD THE AIRPLANE. THE CAPTAIN AND FLIGHT ENGINEER SUSTAINED MINOR INJURIES WHILE EVACUATING THE AIRPLANE. THE AIRPLANE WAS DESTROYED BY FIRE AFTER THE LANDING.

Recommendation # A-98-078

Overall Status
CAA

Priority

THE NTSB RECOMMENDS THAT THE FAA: REEXAMINE THE FEASIBILITY OF ON-BOARD AIRPLANE CABIN INTERIOR FIRE EXTINGUISHING SYSTEMS FOR AIRPLANES OPERATING UNDER 14 CODE OF FEDERAL REGULATIONS PART 121 &, IF FOUND FEASIBLE, REQUIRE THE USE OF SUCH SYSTEMS.

FAA

Closed - Acceptable Action

4/22/1999

10/27/1998 Addressee Letter Mail Controlled 11/2/98 5:28:03 PM MC# 981312 THE FAA'S MAIN DECK FIRE PROTECTION REQUIREMENTS DIFFER FOR CARGO AND PASSENGER OPERATIONS. A CARGO COMPARTMENT OF AN AIRPLANE USED ONLY FOR THE CARRIAGE OF CARGO (FREIGHTERS) IS CLASSIFIED AS A CLASS E CARGO COMPARTMENT. IN LIEU OF PROVIDING EXTINGUISHMENT IN CLASS E COMPARTMENTS, THE FAA REQUIRES THAT A MEANS BE PROVIDED TO SHUT OFF THE FLOW OF VENTILATING AIR TO OR WITHIN THE COMPARTMENT. ADDITIONALLY, PROCEDURES LIKE DEPRESSURIZING THE AIRPLANE ARE STIPULATED TO MINIMIZE THE AMOUNT OF OXYGEN AVAILABLE IN THE EVENT A FIRE OCCURS IN A CLASS E COMPARTMENT. A CLASS E COMPARTMENT IS TYPICALLY THE ENTIRE CABIN OF AN ALL-CARGO AIRPLANE. HOWEVER, A CLASS E COMPARTMENT MAY BE LOCATED IN OTHER PORTIONS OF THE AIRPLANE. THIS DOES NOT PRECLUDE THE INSTALLATION OF CLASSES A, B, OR C COMPARTMENTS IN ALL-CARGO AIRPLANES. SMOKE DETECTION SYSTEMS ARE REQUIRED IN CLASS E COMPARTMENTS. CLASS C COMPARTMENTS REQUIRE BUILT-IN FIRE SUPPRESSION SYSTEMS. THE PRINCIPLE REASON FOR USING THE CLASS E CONCEPT IS THAT THE ADDED WEIGHT FOR EXTINGUISHING SYSTEMS AND FLUID IS ELIMINATED, ALLOWING MORE CARGO TO BE ACCOMMODATED. REQUIREMENT OF BUILT-IN SUPPRESSION SYSTEMS WOULD ADD CONSIDERABLE WEIGHT TO THE AIRPLANE. THE FAA ADDRESSED THE CONCERNS OF CARGO COMPARTMENTS ON PASSENGER AIRCRAFT THROUGH AMENDMENTS 25-93 AND 121-269, EFFECTIVE 3/19/98. THESE RULE CHANGES REQUIRE THE INSTALLATION OF FIRE DETECTION AND SUPPRESSION EQUIPMENT IN ALL CARGO COMPARTMENTS ON PASSENGER AIRCRAFT RESULTING IN THE CONVERSION OF A CLASS D COMPARTMENT TO A CLASS E COMPARTMENT IN ALL CARGO AIRPLANES. THE FAA HAS SUPPORTED A THOROUGH PROGRAM TO DEVELOP CABIN WATERSPRAY SYSTEMS AS A MEANS OF AFFORDING OCCUPANTS OF PASSENGER AIRCRAFT MORE TIME TO ESCAPE A POSTCRASH CABIN FIRE. WHILE THIS SYSTEM DOES PROVIDE ADVANTAGES OVER LOW-HEAT RELEASE MATERIALS, THERE ARE OTHER OPERATIONAL CONSIDERATIONS AND SAFEGUARDS THAT MUST BE ADDRESSED. HOWEVER, THE FAA IS CONSIDERING SUCH SYSTEMS IN THE CONTEXT OF THE VERY LARGE, HIGH-CAPACITY PASSENGER AIRPLANES NOW UNDER DISCUSSION. AT THE PRESENT TIME, THE FAA DOES NOT PLAN TO INITIATE A RULEMAKING PROJECT MANDATING THE INSTALLATION OF A BUILT-IN PASSENGER CABIN FIRE SUPPRESSION SYSTEM. I CONSIDER THE FAA'S ACTION TO BE COMPLETED ON THIS RECOMMENDATION.

4/22/1999 NTSB

A-98-78 ASKED THE FAA TO REEXAMINE THE FEASIBILITY OF ON-BOARD AIRPLANE CABIN INTERIOR FIRE EXTINGUISHING SYSTEMS FOR AIRPLANES OPERATING UNDER 14 CFR PART 121 AND, IF FOUND FEASIBLE, REQUIRE THE USE OF SUCH SYSTEMS. THE FAA'S ACTIONS ARE CONSISTENT WITH A-98-78, AND IT IS CLASSIFIED "CLOSED--ACCEPTABLE ACTION." HOWEVER, THE SAFETY BOARD IS DISAPPOINTED THAT THE FAA REVIEW OF THE SAFETY VALUE OF INSTALLING CABIN FIRE SUPPRESSANT SYSTEMS IN CURRENT AIRCRAFT DID NOT DETERMINE THAT THESE SYSTEMS SHOULD BE REQUIRED. THE SAFETY BOARD BELIEVES THAT CABIN FIRE SUPPRESSION SYSTEMS OFFER A SIGNIFICANT IMPROVEMENT IN FIRE SAFETY. WE, THEREFORE, ENCOURAGE THE FAA TO CONTINUE TO EVALUATE THESE SYSTEMS AND PROMOTE NEW TECHNOLOGY TO REDUCE WEIGHT, INCREASE RELIABILITY, AND OFFER A SYSTEM WITH THE FINANCIAL FEASIBILITY THAT WILL ENCOURAGE AIRLINES TO ADOPT THEM.

Recommendation Report

Tuesday, June 27, 2006

Recommendation # A-98-079

**Overall Status
CAA**

Priority

THE NTSB RECOMMENDS THAT THE FAA: REVIEW THE AIRCRAFT CABIN INTERIOR FIREFIGHTING POLICIES, TACTICS, & PROCEDURES CURRENTLY IN USE, & TAKE ACTION TO DEVELOP & IMPLEMENT IMPROVEMENTS IN FIREFIGHT TRAINING & EQUIPMENT TO ENABLE FIREFIGHTERS TO EXTINGUISH AIRCRAFT INTERIOR FIRE MORE RAPIDLY.

FAA

Closed - Acceptable Action

4/22/1999

10/27/1998 Addressee Letter Mail Controlled 11/2/98 5:28:03 PM MC# 981312 THE FAA HAS BEEN INVOLVED IN ADVANCING THE STATE OF THE ART IN RESPONDING TO EXTERIOR AND INTERIOR AIRCRAFT FIREFIGHTING POLICIES, TACTICS, AND PROCEDURES. AS A RESULT OF FAA RESEARCH AND DEVELOPMENT, AN ELEVATED BOOM WITH A SKIN-PENETRATING NOZZLE HAS BEEN DEVELOPED. THIS DEVICE CAN PENETRATE THE SKIN OF AN AIRCRAFT AND DISPENSE AGENT OR WATER WITHIN THE FUSELAGE OF THE AIRCRAFT. THIS DEVICE IS BEING USED AT MANY AIRPORTS IN THE UNITED STATES. THE FAA HAS ALSO FUNDED 12 LARGE FIREFIGHTING TRAINING FACILITIES THROUGHOUT THE COUNTRY, EACH WITH AN AIRCRAFT SIMULATOR THAT CAN BE USED FOR INTERIOR ATTACK. IN COMPLYING WITH 14 CFR PART 139 REQUIREMENTS FOR AN ANNUAL "HOT FIRE" TRAINING EXERCISE, MANY FIRE DEPARTMENTS USE THE INTERIOR SIMULATIONS THAT ARE AVAILABLE AT THESE TRAINING FACILITIES. THE FAA HAS WORKED CLOSELY WITH INDUSTRY IN THE DEVELOPMENT OF MOBILE SIMULATORS, SMALLER VERSIONS OF THEIR FIXED COUNTERPARTS, WHICH CAN BE MOVED FROM AIRPORT TO AIRPORT AND CAN OFFER INTERIOR SIMULATION OPTIONS. I BELIEVE THAT THE FAA HAS MET THE FULL INTENT OF THIS RECOMMENDATION, AND I PLAN NO FURTHER ACTION.

4/22/1999 NTSB

THE SAFETY BOARD APPRECIATES THE EFFORTS OF THE FAA IN WORKING WITH AIRPORT FIREFIGHTING AGENCIES TO DEVELOP AND IMPROVE FIREFIGHTING TACTICS THAT ARE UNIQUE TO AVIATION. IT IS IMPORTANT THAT THE FAA CONTINUES THIS EFFORT AND EMPHASIZES FIGHTING INTERIOR CABIN FIRES AND WILL CONTINUE TO PURSUE IMPROVEMENTS. BASED ON THE FAA'S ACTIONS AND CONTINUED SUPPORT OF FIREFIGHTING PROGRAMS NATIONWIDE, A-98-79 IS CLASSIFIED "CLOSED--ACCEPTABLE ACTION."

Recommendation Report

Tuesday, June 27, 2006

10/15/200 Addressee Letter Mail Controlled 11/5/2003 8:16:20 AM MC# 2030535 The Federal Aviation Administration (FAA) has reviewed the material from the William J. Hughes Technical Center's Research Project Description (RPD) Number 558, Aircraft Fire Safety and Cabin Safety, Project 061-110, Fire Research and Safety on Multiple Sensor Technology. The intent of the study was to develop information regarding detector response characteristics using certain gas parametric signatures (CO, CO2, HC, O2, etc.) that newer technology sensors use to detect fires. The results showed that the use of a combination of various gas signature detectors would readily detect "flaming fires" with a reduction of false alarms. However, the characteristic of the initial stage of a typical cargo fire is a "smoldering fire." The majority of smoldering fire effluents are particulates, which readily trigger typical fire detection systems now in use in cargo compartments. The gas detectors do not detect particulates well. The use of these advanced sensors would likely decrease the false alarm rate but sacrifice early detection of a smoldering fire. The FAA's position on fire protection of cargo compartments has been predicated on the quick determination of the existence of the fire before it can grow to a conflagration that would negate the fire protection features within the compartment or damage flight critical systems outside of the compartment. The FAA has characterized the "small smoldering suitcase fire" as the type of fire to be detected. The FAA believes that a reduction in false alarms of typical cargo compartment detector systems may be possible by designing a system of multiple particulate sensors with varying detection time triggering thresholds, which use a voting hierarchy alarm architecture. The FAA is working with airframe manufacturers and foreign authorities on this issue.

2/9/2004 NTSB I will keep the Board informed of the FAA's progress on this safety recommendation. The Safety Board notes with interest the recently reported results of the FAA research project which showed that a combination of various gas signature detectors would readily detect "flaming fires" with a reduction of false alarms. However, the initial stage of a typical cargo fire is a smoldering fire, and particulates compose the majority of smoldering fire effluents. Particulates readily trigger typical fire detection systems now in use in cargo compartments. In contrast, gas detectors do not detect particulates well. While use of these advanced sensors would decrease the false alarm rate, this would be achieved at the sacrifice of early detection of a smoldering fire. The FAA believes that fire protection of cargo compartments should be predicated on the quick determination of the existence of a smoldering fire before it can grow to a conflagration. The FAA is working with airframe manufacturers and foreign authorities to develop a system of multiple particulate sensors with varying detection time triggering thresholds which use a voting hierarchy alarm architecture. The FAA believes that such a system may reduce false alarms of typical cargo compartment detector systems.

The Safety Board notes that the evacuation study, which prompted this recommendation, found noteworthy differences in the false alarm rate for some regional "commuter aircraft" compared to other transport category aircraft. The study examined the FAA's Service Difficulty Reporting (SDR) system and found 30 reports of false cargo smoke indications involving Saab 340s and 15 reports involving Canadair Regional Jets (CRJ) for the period from October 1998 to November 1999. In comparison, for the substantially larger fleet of all Boeing aircraft, the SDR contained only 16 false smoke indications for the same period. Thus, the Saab 340 and CRJ have a substantially higher false alarm rate.

The FAA's plan to develop and test a system to detect cargo compartment fires and reduce the false alarm rate without sacrificing early detection of smoldering fires with primarily particulate effluents is responsive to this recommendation. The Board believes that as part of this effort to develop more reliable smoke alarms, the FAA should determine the cause of the higher false alarm rate in Saab 340 and CRJ aircraft compared to the fleet of Boeing aircraft. Pending the development and adoption of improvements to cargo smoke detection systems to reduce the rate of false alarms, Safety Recommendation A-00-91 remains classified "Open--Acceptable

Total Number of Recommendations for Recommendation Report: 10

Selection for Report: