log. 2761

National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: DEC 9 1999

In reply refer to: A-99-99 through -103

Honorable Jane F. Garvey
Administrator
Federal Aviation Administration
Washington, D.C. 20591

On July 9, 1998, about 1007 Atlantic standard time, an Airbus Industrie A300B4-605R, N80057, operated by American Airlines, Inc., (American) as flight 574, experienced a fire in the No. 1 (left) engine shortly after takeoff from San Juan, Puerto Rico. The flight crew declared an emergency, initiated the in-flight engine fire procedures, and returned to San Juan for an emergency landing. After the plane was stopped on the runway, the captain ordered an emergency evacuation. Of the 252 passengers and crewmembers on board, 28 passengers received minor injuries during the evacuation.[1]

During the emergency evacuation, four of the eight exits were not used because of the engine fire or the emergency response vehicles that blocked the airplane's four left side exits. Flight attendants attempted to open the four right side exits; however, two of those exits (1R and 3R) did not operate as intended. The flight attendant at the 1R door said that when he attempted to open the door it only went "out one foot and forward a foot." He stated that he had "to pull it back again and then gave it a big push in order to unjam the slide [slide/raft] from the door. At that time the slide opened." Postincident examination revealed that the power assist actuator did not function when the door was opened in the emergency mode.

The flight attendant at the 3R door stated that he tried to open the door but it did not fully open and the slide did not deploy. He said that he "pushed several times and it didn't budge." He explained that he "knew [the slide] was caught up" in the pack. Postincident testing conducted by the National Transportation Safety Board indicated that the malfunction might have been caused by a Velcro fastener that became hooked on a clip on the inside of the decorative cover.[2]

[1]For more information, see Brief of Incident MIA98IA195 (enclosed).

[2]A photograph taken by a passenger shows an exterior view of exit 3R and the partially deployed slide. The Survival Factors Group conducted several tests to replicate the condition shown in the photograph. One test, in which a Velcro positioner on the evacuation slide was deliberately hooked around an aft retention clip on the evacuation slide's decorative cover, prevented the exit from opening fully and caused the slide pack to be positioned

Exits 2R and 4R opened normally, but the 4R slide/raft was blown on its side by the wind and could not be used until it was stabilized by a person on the ground. Further, although the left side exits were not used during the evacuation, exit 1L was opened slightly by the purser to assess conditions outside the airplane. Postincident testing revealed that the power assist actuator for exit door 1L did not activate when the door was opened in the emergency mode.

The Safety Board is concerned that, of the four emergency exits that the flight attendants attempted to use during the emergency evacuation, two (1R and 3R) did not function as intended. Further, another door (1L) did not function as intended when it was partially opened to assess conditions on the left side of the airplane. The problems encountered in this evacuation are especially troubling because it is common during emergency evacuations for some exits to become unavailable for unforeseen reasons (such as a fire on one side of an airplane);[3] therefore, it is critical that all emergency exits and slide/rafts be capable of operating properly at all times. As discussed below, many previous Safety Board accident and incident investigations have also revealed that emergency evacuation systems[4] often do not operate as intended.

History of Malfunctioning Emergency Evacuation Systems

Tampa, Florida (Boeing 727)

On November 6, 1986, a Pan American 727 was involved in a ground collision with a Piper PA23-150 in Tampa, Florida; two of the four floor level exits (1L and 2R) did not function as intended. The flight attendant at exit 2R was able to open the door only 9 inches. During the postaccident investigation, the door required eight separate pushes to be opened. Another flight attendant had difficulty opening exit 1L. The Safety Board's investigation revealed that decorative carpeting installed on the slide covers caused increased resistance that could prevent proper slide deployment.[5]

Detroit, Michigan (Boeing 747)

On February 11, 1987, a United Airlines (United) 747 diverted to Detroit, Michigan, after receiving a bomb threat. An evacuation was initiated after landing. Problems were encountered at 2 of the 10 emergency exits. Exit 4R did not operate as intended because the door's pneumatic

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in a manner similar to that shown in the passenger's photograph. The retention clip was supposed to have been removed per Airworthiness Directive (AD) 92-10-06, which also required installation of "wear strip with rivets on both sides of decorative cover."

[3]In addition, dual-aisle airplanes may be dispatched with an inoperative passenger door or slide/raft according to the airplane's minimum equipment list (in some cases, passenger-load restrictions may apply). Single-aisle airplanes may not be dispatched with an inoperative passenger door, slide, or slide/raft.

[4]The Safety Board defines an evacuation system as an airplane's exit, power assist mechanism (if present), overwing ramp (if present), and slide or slide/raft.

[5]As a result of this accident, the Safety Board issued Safety Recommendation A-87-26, asking the Federal Aviation Administration (FAA) to "alert the FAA principal maintenance inspectors of the operators with airplanes that have door-mounted evacuation slide containers to verify that any modified slide containers open freely and without resistance or interference." This recommendation was classified "Closed—Acceptable Action" on April 12, 1988.

assist device failed to operate; it had to be opened manually. The slide/raft did not inflate automatically, and the flight attendant blocked that exit and redirected passengers to other exits. Exit 5R could not be used because a flight attendant inadvertently disconnected the slide/raft from the door.[6]

Romulus, Michigan (DC-9)

On December 3, 1990, a Northwest Airlines DC-9 was involved in a ground collision with a Northwest Airlines 727 in Romulus, Michigan. A fire ignited inside the DC-9 when the 727's right wing penetrated the right side of the DC-9 cabin. Of the DC-9's five emergency exits (two floor-level exits, two overwing exits, and one tailcone exit), two right side exits were unusable because of severe structural damage and the tailcone exit malfunctioned and did not open. The bodies of a flight attendant and a passenger were recovered in the tailcone of the airplane. During the investigation, it was discovered that the internal tailcone release handle was broken, thereby preventing the tailcone from releasing and the slide from deploying.[7]

Guatemala City, Guatemala (Boeing 767)

On April 5, 1993, a Taca International Airlines 767 crashed while landing on a wet runway in Guatemala City, Guatemala. The airplane could not stop and it exited the runway, went through the perimeter fence, traveled down a hill, and struck several private residences before it came to rest. The airplane was successfully evacuated; however, the left overwing escape slide compartment did not open when the emergency exit hatch was opened by a passenger. The slide compartment did not open because one of the four latches that keeps the compartment closed was installed upside-down.[8]

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[6]For more information read *Flight Attendant Training and Performance During Emergency Situations* Special Investigation Report NTSB/SIR-92/02.

[7]As a result of this accident, the Safety Board issued Safety Recommendation A-91-3, asking the FAA to "immediately require a fleet-wide inspection of all DC-9 tailcone assemblies...require detailed visual examinations of the interior and exterior tailcone release handles for broken or cracked shafts and for damage from contact with the lock cable ball-end fitting...and require that damaged handles be repaired or replaced." This recommendation was classified "Closed—Acceptable Action" on August 2, 1991.

[8]As a result of this accident, the Safety Board issued Safety Recommendations A-93-66 through -68. Safety Recommendation A-93-66 asked the FAA to "issue an emergency airworthiness directive to inspect all Model 767 and Model 747 series airplanes for improper installation of the off-wing escape slide compartments latches." It was classified "Closed—Acceptable Alternate Action" on October 11, 1994. Safety Recommendation A-93-67 asked the FAA to "issue an immediate revision to Airworthiness Directive 92-16-17 to include the additional information provided in Revision 1 to Service Bulletin [SB] 767-25A0174, which provides operators information on how to install the escape slide compartment door latches properly." It was classified "Closed—Acceptable Action" on October 11, 1994. Safety Recommendation A-93-68 asked the FAA to "require Boeing to modify Model 767 and Model 747 escape slide compartment door latches to prevent the possibility of incorrect installation." It was classified "Closed—Unacceptable Action" on October 11, 1994.

East Granby, Connecticut (MD-83)

On November 12, 1995, an American MD-83 landed short of the runway at East Granby, Connecticut, after contacting trees and an instrument landing system antenna during final approach. A flight attendant reported that after he opened the aft galley exit, the slide did not automatically inflate. He pulled the manual inflation cable and the slide inflated. During the investigation, the Safety Board found that the slide was misrigged and that the instructions for rigging the inflation cable contained in the McDonnell Douglas DC-9/MD-80 maintenance manual were ambiguous.[9]

Grand Rapids, Michigan (Boeing 737)

On November 18, 1996, a 737-222, N9038U, operated by United as flight 422, was evacuated at Grand Rapids, Michigan, because of a possible fire in the No. 2 engine. Eighty-two passengers and five crewmembers were on board. A 79-year-old passenger fractured her ankle during the evacuation. Of the airplane's four floor-level exits, three (1L, 2L, and 2R) did not operate as intended.

When the 1L door was opened, the evacuation slide deployed but it did not inflate. The flight attendant pulled the slide's manual inflation handle but could not inflate the slide. The first officer also had difficulty pulling the manual inflation handle but, with about "80 pounds of pull," he was able to manually inflate the evacuation slide.

The flight attendant who attempted to open the 2L exit stated that the door handle was difficult to move and that after she called for help, a male passenger assisted her. She and the passenger each used their hands to rotate the exit door's handle, but they were unable to fully open the door. The 2L evacuation slide subsequently fully inflated inside the cabin, blocking exits 2L and 2R.

The flight attendant who opened the 2R exit stated that she rotated the door handle to the full-open position but had to push on the door about seven times before the door swung out and locked in its open position. When the slide did not inflate automatically after 3 to 4 seconds, she pulled the manual inflation handle; the slide immediately inflated, and she evacuated five to eight passengers from the 2R exit before she was forced to evacuate when the 2L slide inflated into the space at the 2R exit.

The cause of the problems at exits 1L, 2L, and 2R was never conclusively determined. United conducted postevacuation testing (without Safety Board participation) and, based on those tests, attributed the difficulties in opening the doors to the Velcro material that was

[9]As a result of this accident, the Safety Board issued Safety Recommendation A-96-138, asking the FAA to "require all operators to inspect immediately all MD-80 and DC-9 floor level exits to ensure that the evacuation slides have been properly rigged," and Safety Recommendation A-96-139, asking the FAA to "require Douglas Aircraft Company to review and amend its MD-80 and DC-9 maintenance manuals so that terminology used in graphics and instructions pertaining to the installation and removal of evacuation slides are clear and consistent." Both recommendations were classified "Closed—Acceptable Action" on August 26, 1997.

attached to the slide girts to hold the girt bar in position.[10] There is also some evidence that the difficulties in opening these doors might have been related to shrinkage of nylon webbing reinforcement on the slide girts. The slide girts at 1L, 2L, and 2R were constructed with stitched nylon webbing reinforcements that had shrunk from their original length, whereas the slide girt at exit 1R (which functioned properly) had been replaced with a girt with folded edge reinforcements.[11]

Honolulu, Hawaii (L-1011)

On August 7, 1997, a Delta Air Lines (Delta) Lockheed L-1011 performed a rejected takeoff in Honolulu, Hawaii. After the airplane came to a stop, a wheel/brake fire occurred in the left main landing gear, and an evacuation was initiated. Of the airplane's eight floor-level exits, two (2R and 4R) did not function properly and could not be used. Further, two of the remaining exits (3L and 4L) were not used because of the fire on the left side of the airplane. Two hundred ninety-six passengers and 13 crewmembers evacuated. One passenger sustained a serious injury, and 56 passengers and 2 flight attendants sustained minor injuries during the evacuation.

Exit door 2R opened approximately 24 inches, which was not sufficient to eject the slide/raft pack from its compartment. The door's counterbalance was removed and returned to its manufacturer for a teardown inspection under Safety Board supervision; it was determined that the "unit had reduced output torque and ran rough throughout the entire cycle." Disassembly revealed that 1 of the 18 springs was broken, and the main bearing races were significantly worn.

Exit door 4R opened approximately 2 to 3 inches. It was found that the lower left corner of the slide packboard assembly was cracked and that a piece of the packboard had broken free along the edge of the girt bar retainer and prevented the door from opening. The investigation revealed that the door would operate normally in the emergency mode without the evacuation slide engaged in the girt assembly.

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[10]United conducted and videotaped a series of slide deployment tests on aft cabin doors, the first of which revealed that in three of the five slide deployments, "the slide became jammed between the door and the bottom of the door opening. This did not allow the door to open fully and would not allow the slide to deploy." United concluded that "the Velcro [material] attached to the girt (to hold the girt bar in position) could contribute to jamming of the door" because it caused the girts to be more rigid and resistant to separating during slide deployment, and the Velcro made the girt thicker and possibly interfered with and/or jammed the door when attempting to open the door. The Velcro (which was part of the original slide design) was removed, and four subsequent tests resulted in normal deployment.

[11]In 1985, as a result of a 737 accident at Manchester, England, Boeing issued SB 737-25A1182, which stated that "[i]nvestigation has also disclosed that nylon webbing reinforcement installed on some slide girts may shrink. During door opening the shrunken girt may become taut before the latch assembly cable, thereby restricting further opening and preventing the deployment of the slide." As a result, the FAA issued AD 85-25-04, which required the inspection and modification and functional testing of 737-100, 200, and 300 escape slide containers and an inspection of the girt for nylon webbing reinforcement along forward and aft edges of girt. If webbing was noted, the AD required that the operator "replace the slide or replace the girt." Although United did not, at that time, replace the slides or girts that had such webbing, it did make several other modifications to the evacuation slides. The FAA issued United an Alternate Means of Compliance for AD 85-25-04.

Manchester, United Kingdom (DC-10)

On March 8, 1998, a Continental DC-10 in Manchester, United Kingdom, was evacuated because of a fuel spill discovered as the airplane was taxiing to the runway. All eight doors were successfully opened, but only six of the evacuation slide/rafts deployed and inflated normally. Two slide/rafts (1R and 3L) did not operate as intended. The slide/raft at exit 1R had low inflation pressure, and ground personnel were required to assist at the bottom to maintain a usable slide/raft. According to the slide/raft manufacturer, the likely cause for the low inflation pressure was improper functioning of the regulator valve from one of the slide/raft's aspirators.

At exit 3L, the offwing slide/raft portion of the escape system did not inflate. The ramp portion (which inflates on top of the left wing) inflated normally. The cabin crewmember at that exit was not aware that the offwing slide/raft had not inflated and sent passengers onto the left wing ramp. After it was discovered that the offwing slide/raft had not inflated, passengers were reboarded from the left wing ramp and directed to other exits. According to the Air Accident Investigation Branch of the United Kingdom, the cause of the malfunction was an unconnected inflation cable.

Because of the continued malfunctions that occur on all airplane types during actual emergency evacuations,[12] it is apparent that current maintenance practices and operational checks do not adequately ensure that emergency evacuation systems will operate as intended in the event of an actual emergency evacuation. Therefore, more aggressive measures are needed by the FAA to identify and correct potential malfunctions in emergency evacuation systems before those systems are needed in an actual emergency evacuation.

Adequacy of Existing Emergency Evacuation System Maintenance Programs

All U.S. air carriers have an FAA-approved maintenance program for each airplane type that they operate. These programs require that the components of an airplane's emergency evacuation system be periodically inspected and/or serviced. An FAA principal maintenance inspector (PMI) approves the air carrier maintenance program based on guidance in the FAA Inspector Handbook 8300.10 and the Maintenance Review Board (MRB) report.[13] Maintenance programs may differ between airlines at the discretion of the PMI assigned to the air carrier.

Although most air carrier maintenance programs require that some percentage of emergency evacuation slides or slide/rafts be deployed on an airplane, the overall percentage of required on-airplane deployments is generally very small. For example, American's FAA-approved maintenance program for the A300[14] requires an on-airplane operational check of a total of four slides or slide/rafts (with the door in the armed/emergency mode) per year in the

[12]The Safety Board is currently conducting a safety study of emergency evacuations of commercial aircraft. The A300 evacuation at San Juan, Puerto Rico, is included in the safety study.

[13]An MRB report "outlines the initial minimum maintenance/inspection requirements to be used in the development of an approved continuous maintenance program for the...components...of the (aircraft make, model, and series)."

[14]Per American's Maintenance Planning Document, "Engineering Specification Maintenance A300," page 25-9, Revision BF, December 17, 1998.

A300 fleet.[15] Delta's FAA-approved maintenance program for the L-1011 requires that Delta activate a full set of emergency exits and evacuation slides or slide/rafts every 24 months. United has an FAA-approved maintenance program that does not require that any slides be deployed on its 737 airplanes.

It should be noted that the FAA allows American to include inadvertent and actual emergency evacuation deployments towards accomplishment of its maintenance program; therefore, it is possible that American would not purposely deploy any slides or slide/rafts on an A300 to comply with the deployment requirement during any given year. The FAA also allows Delta to include inadvertent and actual emergency evacuation deployments towards accomplishment of its maintenance program.[16] The Safety Board is concerned that the FAA allows operators to include inadvertent and actual deployments to meet the deployment requirements found in their maintenance programs. Because inadvertent and actual deployments do not occur in a controlled environment, problems with, or failures in the system may be more difficult to identify and record, and personnel qualified to detect such failures may not be present. For example, in an inadvertent or actual slide or slide/raft deployment such things as the effectiveness of the power assist actuator, the timing of the slide or slide/raft inflation, and the slide or slide/raft inflation pressure most likely will not be observed or recorded. Therefore, the current practice of allowing inadvertent and actual slide or slide/raft deployments to be counted as part of maintenance programs does not provide adequate information about the interaction of the slide or slide/raft with the door or the effectiveness of power assist opening systems, nor does it provide feedback on the effectiveness of crew training mock-ups. Accordingly, the Safety Board believes that the FAA should discontinue the practice of allowing inadvertent and actual slide or slide/raft deployments to be used as a method of demonstrating compliance with an air carrier's Federal Aviation Administration-approved maintenance program.

Additionally, the Safety Board believes that the FAA, for a 12-month period, should require that all operators of transport-category aircraft demonstrate the on-airplane operation of all emergency evacuation systems (including door opening assist mechanisms and slide or slide/raft deployment) on 10 percent of each type of airplane (minimum of one airplane per type) in their fleets. These demonstrations should be conducted on an airplane in a controlled environment so that the entire evacuation system can be properly evaluated by qualified personnel. The results of the demonstrations (including an explanation of the reasons for any failures) should be documented for each component of the system and should be reported to the FAA.

The Safety Board further believes that the FAA should revise the requirements for evacuation system operational demonstrations and maintenance procedures in air carrier

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[15]American currently operates 35 A300 series airplanes. Therefore, American must perform an operational check on 4 out of 280 A300 slides or slide/rafts per year.

[16]The 1991 MRB report for the L-1011 recommended that operators activate (on the airplane) all L-1011 door evacuation systems (including slide/raft deployment) every time an individual slide/raft becomes due for an operational check, inspection, or repack, or at least every 3 years, whichever is earlier.

maintenance programs to improve the reliability of evacuation systems on the basis of an analysis of the demonstrations recommended in Safety Recommendation A-99-100. Participants in the analysis should include representatives from aircraft and slide manufacturers, airline operators, and crewmember and maintenance associations. Further, the Safety Board believes that the FAA should, based on reports of component or system failures discovered in the demonstration program recommended in Safety Recommendation A-99-100, establish an effective method of identifying recurring or potentially recurring failure modes and ensuring that those failures are adequately addressed by issuing airworthiness directives or taking other appropriate actions. Additionally, the Safety Board is concerned that maintenance personnel may not be properly trained on the installation, repair, and inspection of emergency evacuation systems. Therefore, the Safety Board believes that the FAA should ensure that all personnel accomplishing any installation, repairs, or inspections of emergency evacuation systems receive training to ensure that they have proper knowledge of the operation and installation of the systems.

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

Discontinue the practice of allowing inadvertent and actual slide or slide/raft deployments to be used as a method of demonstrating compliance with an air carrier's Federal Aviation Administration-approved maintenance program. (A-99-99)

For a 12-month period, require that all operators of transport-category aircraft demonstrate the on-airplane operation of all emergency evacuation systems (including door opening assist mechanisms and slide or slide/raft deployment) on 10 percent of each type of airplane (minimum of one airplane per type) in their fleets. These demonstrations should be conducted on an airplane in a controlled environment so that the entire evacuation system can be properly evaluated by qualified personnel. The results of the demonstrations (including an explanation of the reasons for any failures) should be documented for each component of the system and should be reported to the FAA. (A-99-100)

Revise the requirements for evacuation system operational demonstrations and maintenance procedures in air carrier maintenance programs to improve the reliability of evacuation systems on the basis of an analysis of the demonstrations recommended in Safety Recommendation A-99-100. Participants in the analysis should include representatives from aircraft and slide manufacturers, airline operators, and crewmember and maintenance associations. (A-99-101)

Based on reports of component or system failures discovered in the demonstration program recommended in Safety Recommendation A-99-100, establish an effective method of identifying recurring or potentially recurring failure modes and ensuring that those failures are adequately addressed by issuing airworthiness directives or taking other appropriate actions. (A-99-102)

Ensure that all personnel accomplishing any installation, repairs, or inspections of emergency evacuation systems receive training to ensure that they have proper knowledge of the operation and installation of the systems. (A-99-103)

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred with these recommendations.

By: Jim Hall
Chairman

Enclosures

National Transpoı _ıon Safety Board
Washington, D.C. 20594

Brief of Incident

Adopted 11/16/99

MIA98IA195
FILE NO. 5018 07/09/98 SAN JUAN, PR AIRCRAFT REG NO. N80057 TIME (LOCAL)- 10:07 AST

MAKE/MODEL -Airbus-A300B4-605R
ENGINE MAKE/MODEL -G E CF6-80C2A5
AIRCRAFT DAMAGE -Minor
NUMBER OF ENGINES -2
OPERATING CERTIFICATES -Flag carrier/domestic
NAME OF CARRIER -AMERICAN AIRLINES, INC.
TYPE OF FLIGHT OPERATION -Scheduled
-Domestic
-Passenger
REGULATION FLIGHT CONDUCTED UNDER -14 CFR 121

	FATAL	SERIOUS	MINOR/NONE
CREW	0	0	9
PASS	0	0	243

LAST DEPARTURE POINT - Same as Incident
DESTINATION - MIAMI,FL

AIRPORT PROXIMITY - Off airport/airstrip
AIRPORT NAME - LUIZ MUNOZ MARIN INT'L
RUNWAY IDENTIFICATION - 08
RUNWAY LENGTH/WIDTH (Feet) - 10002/200
RUNWAY SURFACE - Asphalt
RUNWAY SURFACE CONDITION - Dry

CONDITION OF LIGHT - Daylight

WEATHER INFO SOURCE- Weather observation facility

BASIC WEATHER - Visual (VMC)
LOWEST CEILING - None
VISIBILITY - 10.000 SM
WIND DIR/SPEED - 070 /013 KTS
TEMPERATURE (F) - 84
OBSTR TO VISION - None
PRECIPITATION - None

PILOT-IN-COMMAND AGE - 53

CERTIFICATES/RATINGS
Airline transport, Flight engineer
Single-engine land, Multiengine land
INSTRUMENT RATINGS
Airplane

FLIGHT TIME (Hours)

TOTAL ALL AIRCRAFT - 17100
LAST 90 DAYS - Unk/Nr
TOTAL MAKE/MODEL - 3705
TOTAL INSTRUMENT TIME - Unk/Nr

Shortly after takeoff, as the flight climbed through 3,100 feet, the No. 1 engine fire warning activated. About 20 seconds later, the captain, who was the pilot flying, moved the No. 1 throttle to idle and asked the first officer to declare an emergency with air traffic control. About 47 seconds after the first officer identified the No. 1 engine fire warning, the captain asked the first officer to perform the engine fire emergency procedures checklist. The engine fire warning system deactivated because of fire damage to one of the fire loops, about 88 seconds after the fire warning activated and 2 seconds before the first officer moved the No. 1 fuel lever to the off position, shutting down the No. 1 engine. The flight crew did not notice the warning that the No. 1 fire loop system was inoperative. The engine fire warning system uses two loops. If one loop should no longer sense a fire or become inoperative because of fire damage, the engine fire warning will deactivate and a fire loop warning will be displayed to the flight crew. The

flight crew must deactivate the faulty loop to regain the engine fire warning. The crew elected to stop the procedure after shutting down the No.1 engine because the fire light went out, and therefore did not activate the No.1 fire handle. Pressurized fuel continued to be supplied to the engine and feed the engine fire. The flight crew turned back to the departure airport. At 2,000 feet, about 3 minutes from landing, a flight attendant reported that a mechanic in the back had stated that the No. 1 engine was still smoking or on fire. The flight crew did not take any action and landed. About 1 minute after stopping, the captain ordered an emergency evacuation of the airplane, with instructions not to use the left overwing exits. About 1 minute 55 seconds after landing, the flight crew pulled the engine and auxiliary power unit fire handles and discharged the fire bottles into the No. 1 engine. In 1995, Airbus changed the engine fire procedure to allow for discontinuing the fire procedure and keeping an engine running at idle after an engine fire warning once the fire warning has gone out and after the throttle has been moved to idle. This change was made because of the high number of bleed air leak activated fire warnings. Postincident examination of the No. 1 engine showed that all the accessory gearbox idler adapter attachment bolt inserts had backed out, allowing fuel lines to unseat and spray pressurized fuel onto hot engine parts and ignite. On September 26, 1995, the accessory gear box idler adapter had been reworked per General Electric Aircraft Engine Service Bulletin 72-743 during engine overhaul at a vendor's facility. Smaller-than-required adapter bolt inserts had been installed.

Safety Recommendation Reiteration List

SR Number	Reiteration Number	Report Number	Report Date	Accident Description	Accident City	Accident State	Accident Date
A-99-100	1	SS-00-01	6/27/2000	Study Emergency Evacuation of Commercial Airplanes	N/A	N/A	N/A

Safety Recommendation Reiteration List

SR Number	Reiteration Number	Report Number	Report Date	Accident Description	Accident City	Accident State	Accident Date
A-99-101	1	SS-00-01	6/27/2000	Study Emergency Evacuation of Commercial Airplanes	N/A	N/A	N/A