

Log 2406



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: March 8, 1993

In reply refer to: A-93-16 thru -18

Honorable Joseph M. Del Balzo
Acting Administrator
Federal Aviation Administration
Washington, D.C. 20591

On July 30, 1992, about 1743 eastern daylight time, a Lockheed L1011, N11002, operating as Trans World Airlines (TWA) flight 843, was destroyed by fire after the crew executed a takeoff followed by an immediate emergency landing on runway 13R, at the John F. Kennedy (JFK) International Airport in Jamaica, New York. Fire and smoke entered the cabin through the L-3 and L-4 doors during the evacuation. The 3 flight crewmembers, 9 flight attendants, and 280 passengers evacuated the airplane in about 2 minutes using 3 of the 4 emergency evacuation slides at the forward cabin exits. One passenger sustained serious injury and 9 others sustained minor injuries; none of the crewmembers was injured.

The Safety Board's continuing investigation of the accident has developed evidence that corrective action is necessary to ensure that flight attendants have a clear view through windows that are installed in exit doors, that persons who occupy cockpit observer seats lock their seatbelts, and that the fire retardant quality of doors installed on stowage bins complies with 14 CFR 25.853(a)(1)(i), which was in effect when the doors were manufactured.

Emergency Exit Door Window

The flight attendant who was responsible for the L-2 emergency exit was unable to assess conditions outside the exit using the exit door's prismatic window because the window's outside pane was either scratched or crazed. The flight attendant had to leave her exit and move to a passenger window to see the conditions outside the exit. After assessing the conditions through the passenger window, she found it impossible to return to her exit because passengers blocked the aisle that led to the exit. Fortunately, another flight attendant assumed her position at the exit and, when told by the L-2 flight attendant that it was clear outside, opened the door and persons successfully escaped from the burning airplane. The Safety Board is concerned that the flight attendant

had to leave her exit to assess the conditions outside the airplane before the L-2 exit could be opened and that had there not been another flight attendant to control the passengers who had rushed to the exit, the exit may not have been opened; this would have reduced the number of usable exits and greatly delayed the evacuation.

The L1011 had eight cabin floor level doors with each door having an oval-shaped prismatic window that was about 5 inches high and 7 inches wide. The prism permits a downward view of 30° to observe the ground below the airplane, before a door is opened, during normal and emergency conditions. The Safety Board examined a door window on another L1011 operated by TWA and found that several of the outside window panes were crazed or scratched to the extent that it was difficult to view the ground clearly. Some other window panes had scratches or crazing that interfered with a clear view, especially when looking aft.

The Safety Board believes that door windows must be properly maintained in order to provide flight attendants the best possible view of the exterior of the airplane through the door. However, as found during this investigation, if the window panes are scratched or crazed, flight attendants may not be able to accurately assess the conditions outside a door. The Safety Board believes that because this condition may exist on other airplanes that have prismatic windows in exit doors, the FAA should ensure that these windows are airworthy and otherwise adequate for their intended purpose.

Cockpit Observer Seats

Both cockpit observer seats were occupied and the occupant of the seat that was located near the cockpit's aft bulkhead reported that after the airplane came to a complete stop, he found himself on the floor with his lapbelt around his neck. Both seats lost their structural integrity when the airplane struck the ground. Both seatpans were displaced downward and their supporting structures were separated. These were the only seats in the cockpit that were damaged. Both observer seats had undamaged 5-point restraint systems with nonretracting shoulder harnesses and manual locks to keep the left and right sides of each seatbelt assembly from extending from their takeup reels.

The Safety Board's examination of the observer seats, in conjunction with the FAA's Civil Aeromedical Institute, found that the seatpans from both seats had collapsed when downward loads that exceeded the design limits of the seatpans were concentrated on the seatpans' leading edge. Each seat had takeup reels that anchored the left and right halves of each seatbelt assembly. Each reel had a lock to prevent the extension of the seatbelt. Examination found that if an occupant did not lock both the left and right sides of

the seatbelt assembly, the respective belt would extend from its takeup reel when the seatbelt was loaded in the forward direction. This would allow the occupant to move forward, which would exert a downward load on the leading edge of the seatpan. The Safety Board believes that, had the occupants had their seatbelts fastened tightly and locked during the takeoff and subsequent emergency landing, the seatpans would not have lost their structural integrity.

As a result of these findings, TWA issued Safety Bulletin 92-13, which was posted on bulletin boards and placed in "All Pilots Read Books." The bulletin described the seatbelt assembly and how it functions and reminded L1011 flightcrews to ensure that all occupants of observer seats are briefed on the need to lock their seatbelts. The Safety Board is pleased with TWA's immediate response and believes that since this condition may exist with cockpit observer seats on other airplanes, the FAA should instruct operators to require flightcrews to verbally inform occupants of observer seats of the proper operation of their seatbelts and shoulder harnesses and to visually confirm that the restraints are locked, if locks are provided, prior to takeoffs, landings, and during turbulence.

Fire Blocking Materials

The Safety Board, in conjunction with the FAA's Technical Center in Atlantic City, New Jersey, tested the self-extinguishing fire properties of selected cabin materials in accordance with 14 CFR 25.853(a)(1)(i), which was in effect when the airplane was manufactured 20 years ago. The standard was a 60-second vertical bunsen burner test, with an average burn time, after removal of the flame, not exceeding 15 seconds. Specimens from sidewall panels, carpeting, and a ceiling panel from the accident airplane passed the self-extinguishing tests; however, a door from an overhead stowage bin did not pass. After the flame was removed from three samples that had been taken from the door, the door's honeycomb core continued to burn for 24.6 sec, 62.2 sec, and 33.0 sec, respectively. The overhead bins had been installed in the airplane at the time of manufacture.

Although it is not known precisely why the bin door failed to self-extinguish during the burn test, the Safety Board believes that either the door did not comply with the fire-retardancy requirements when it was manufactured or the door's fire-retardant properties deteriorated during the 20 years since it was manufactured. In any event, the Safety Board believes that the FAA should test the fire-retardant properties of all stowage bins that incorporate honeycomb centers that were manufactured to 14 CFR 25.853(a)(1)(i) and research whether fire-retardant materials may deteriorate over time; if they do, the FAA should ensure that these bins are replaced prior to the time when the bins no longer comply with 14 CFR 25.853(a)(1)(i). In addition, these bins should be

replaced with materials that meet the current requirements of Appendix F to 14 CFR 25.853.

The Safety Board is aware that this research could become quite involved in that the FAA will have to determine whether a sample from each bin manufacturer will be representative of all the bins from that manufacturer; whether the characteristics of a manufacturer's bins differ from "batch" to "batch," so that bins from each batch must be tested; whether random sampling will be necessary to determine if there is a need to sample all of a manufacturer's bins more completely; and finally, whether inservice use is a factor in the deterioration of the bins' fire retardant characteristics over time. In short, the Safety Board believes that the FAA should do whatever is necessary to determine the fire retardant properties of all stowage bins that were manufactured to 14 CFR 25.853(a)(1)(i).


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

Require the inspection of windows that are installed in emergency exits to ensure that they are free from damage that would interfere with a clear view and order the replacement of windows that are not airworthy. (Class II, Priority Action) (A-93-16)

Inform operators of L1011 airplanes of the necessity to adjust seatbelts tightly and to lock both sides of the seatbelts (if locks are installed) that are installed on cockpit observer seats before takeoff, landing, and during turbulence. (Class II, Priority Action) (A-93-17)

Research the effect of aging upon the self-extinguishing ability of cabin interior furnishings and test furnishings that were certified to 14 CFR 25.853 (a)(1)(i) to determine if they comply with the self-extinguishing requirements. Interior furnishings that fail to comply with 14 CFR 25.853(a)(1)(i) should be immediately replaced with materials that comply with 14 CFR 25.853, Appendix F. (Class II, Priority Action) (A-93-18)

Chairman VOGT, Vice Chairman COUGHLIN, and Members LAUBER, HART, AND HAMMERSCHMIDT concurred in these recommendations.


By: Carl W. Vogt
Chairman