

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: January 5, 1975

Forwarded to:

Honorable Alexander P. Butterfield  
Administrator  
Federal Aviation Administration  
Washington, D. C. 20591

SAFETY RECOMMENDATION(S)

A-74-105 thru 114

The National Transportation Safety Board is concerned about the number of passengers who are injured or killed during emergency evacuations from air carrier aircraft. As a result, the Safety Board has conducted a study, "Safety Aspects of Evacuations from Air Carrier Aircraft," which identifies and assesses factors that most often affect emergency evacuations. The study revealed several areas in which actions are needed to make emergency evacuations safer for passengers.

During the study, the Safety Board reexamined air carrier accidents during which emergency evacuations took place and examined the Federal Aviation Administration's incident files. From these sources, 10 recent air carrier accidents were selected and discussed in the study, because they best exemplified the most common circumstances encountered during evacuations following "survivable" aircraft accidents.

The Board's study revealed several deficiencies which have occurred repeatedly and have had a detrimental effect on the success of emergency evacuations:

Evacuation Slides--. Three problem areas were found with evacuation slides. First, because deployments of evacuation slides and their failures to function properly are not reported, the reliability of evacuation slide systems cannot be evaluated. Numerous slide failures were identified in the study; however, because the total number of failures cannot be determined, the total significance of the failures identified cannot be established. Second, manually inflated evacuation slides required more time to make an exit usable than fully automatic slide

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systems. In some of the accidents examined, passengers were ready to deplane, or were deplaning, before slides were inflated. Third, it was found that nose-high or tail-high attitudes of wide-bodied aircraft may render some exits unusable, because of the nearly vertical position of the slides. In two accidents studied, slides were unsafe and unusable because of the attitude of the aircraft.

Exterior Emergency Lighting--. Evacuations during darkness require adequate external illumination to reduce the number of injuries. Current exterior lighting systems are activated when main aircraft power is interrupted. During two nighttime accidents studied, the exterior lighting systems were not activated because the aircraft engines were operating during the evacuations; passengers were injured as a result.

Emergency Communications--. Currently, the only type of emergency evacuation communications equipment required by regulation is the megaphone. Megaphones were not used to initiate or to conduct evacuations in any of the accidents or incidents studied. The storage location of megaphones does not place them in easy reach for flight attendants at their evacuation duty stations.

Although the regulations do not require public address systems for emergency communications, these systems are often used to initiate emergency evacuations. However, since the public address systems are not always connected to the emergency electrical supply, they are not always usable when aircraft power is interrupted. The study revealed that a concise evacuation order is essential, and reliable communication during the evacuation is important.

Passenger Safety Information--. While analyzing the 10 specific accidents and other accident information, shortcomings in regulations and procedures for conveying safety information to passengers of air carrier aircraft were revealed. For example, following an evacuation, passengers frequently suggest the need for more safety information, yet they could not recall having heard the pretakeoff briefing, nor had they read the safety information card. These reports are substantiated by Safety Board investigators' observations that passengers generally are not attentive to pretakeoff briefings nor do they read the safety information cards. Since these two sources are generally the only means by which passengers can become acquainted with emergency information, proper presentation of such information is of the utmost importance. Furthermore, the successes of two evacuations which were prebriefed support the conclusion that more adequate safety information must be conveyed to the air carrier passenger and his understanding assured.

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Crewmember Emergency Training--. The performance of the crewmembers during the evacuation has a great potential for causing problems. During several accidents examined, crewmembers either lacked knowledge of the aircraft emergency evacuation systems or failed to follow established procedures. These cases suggest that current crewmember emergency training may be inadequate. The Safety Board has found that the training techniques used by some airlines for crewmember emergency evacuation training rely more on audio-visual demonstrations than on actual "hands-on" training.

In view of the above, the National Transportation Safety Board recommends that the Federal Aviation Administration:

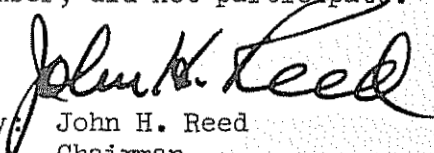
1. Require that air carriers report all emergency evacuation slide deployments, failures, and malfunctions to the FAA.
2. Develop a maintenance surveillance program to insure greater reliability of emergency evacuation slide systems.
3. Amend 14 CFR 25.809 to require that the length of the emergency evacuation slides be such that the angle with the ground renders the slide safe and usable after collapse of one leg, or more, of the landing gear, and amend 14 CFR 121.310 to require that these new slides be installed after a reasonable date.
4. Amend 14 CFR 121.310 to require, after a reasonable date, that emergency evacuation slides on all floor-level exits be automatically inflated upon deployment.
5. Amend 14 CFR 25.812 to require that exterior emergency lighting be activated automatically when exits are opened in the emergency mode, and amend 14 CFR 121.310 to require such automatic activation after some reasonable date.
6. Require that the air carriers designate the flight attendant(s) who will be responsible for use of the megaphone(s) during an evacuation, and relocate the megaphone(s) so they are within easy reach of that flight attendant(s)' seat. Consideration should be given to the installation of new, light and compact megaphones to facilitate stowage and use.

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7. Amend 14 CFR 121.318 to require after a reasonable date, that public address systems be capable of operating on a power source independent of the main aircraft power supply.
8. Require that air carrier passengers be alerted, during pretakeoff briefings, of the need to familiarize themselves with the procedures involved in the operation of emergency exits.
9. Issue an Advisory Circular which would provide standardized guidance to the air transport industry on effective methods and techniques for conveying safety information to passengers.
10. Amend 14 CFR 121.417(c)(4) to eliminate the provision which permits carriers to use demonstrations alone to train crewmembers for certain emergency situations, thus requiring performance of drills in the operation and use of emergency exits.

Representatives of our Bureau of Aviation Safety will be available for consultation in connection with this matter if desired.

REED, Chairman, McADAMS, THAYER, and BURGESS, Members, concurred in the above recommendations. HALEY, Member, did not participate.

By:   
John H. Reed  
Chairman

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