

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

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Forwarded to:

Honorable Donald D. Engen
Administrator
Federal Aviation Administration
Washington, D. C. 20591

SAFETY RECOMMENDATION(S)

A-85-93 through -104

The National Transportation Safety Board has had a long standing concern that some passengers onboard air carrier airplanes have contributed to their own injuries or deaths because they were not prepared to respond appropriately to emergencies. Safety Board accident reports, special studies, and related safety recommendations have shown that past and present means of conveying information on the use of safety equipment are not entirely effective. The preparation of passengers for emergencies depends mainly on flight attendant oral briefings and demonstrations before takeoff, the information contained on the printed briefing cards, videotaped safety briefings, and other instructions, sometimes given under the duress of the emergency itself.

Beginning in 1976, in testimony before subcommittees of the U. S. House of Representatives, the Safety Board has described the need for passengers to be more mindful of emergency procedures, as well as the need to bring home to passengers the message that they are responsible for their own survival if the cabin crewmembers are unable to assist during an evacuation or other emergency. Similar testimony also has been presented by the FAA, the airlines, airline employee associations, and industry experts on passenger safety briefings. In spite of experience in accidents, Safety Board recommendations, testimony before the Congress, and privately developed protocols to test and develop improvements in briefing methods, advances have been very limited. The Safety Board's belief that the continued incidence of passenger education problems in accidents is of serious concern has led to this safety study. As an outgrowth, a full presentation of the Safety Board's findings is set out in the recent Board Safety Study Airline Passenger Safety Education: A Review of Methods Used to Present Safety Information. 1/

As part of this study, a survey was conducted of airlines, employee associations, and passenger groups to elicit their suggestions on ways to improve passenger acceptance of safety information briefings as well as ways to improve the manner of presentation and content of the information.

1/ For more detailed information read Safety Study--"Airline Passenger Safety Education: A Review of Methods Used to Present Safety Information" (NTSB/SS-85/04).

Several suggestions were made for improving passenger briefings. These included the following: advise passengers to count the number of seat rows between exits; design universal or more explicit briefing cards; provide videotaped safety briefings in the boarding lounges or onboard the airplane; conduct a pre-landing briefing; place greater emphasis on the location and operation of exits and overwater equipment; use passengers on an impromptu basis during the briefing to hold the attention of passengers; and conduct periodic surveys to determine if passengers adequately understand briefings. The National Transportation Safety Board believes that there are ways to provide more than rudimentary knowledge of the safety equipment onboard air carrier airplanes to frequent flyers as well as first-time air travellers. For instance, airlines could provide video messages and "hands on" displays of life preservers, oxygen masks, and seatbelts in terminal waiting areas and encourage passengers to operate these devices through marketing techniques. Also, the Department of Transportation, airlines, and the National Advertising Council could provide media public service announcements aimed at informing the public of airplane safety features.

The International Air Transport Association, the Airline Pilots Association, and others agree that pre-landing safety briefings should be given to airline passengers. The Safety Board concurs and believes further that these briefings should be given irrespective of the length of the flight. At the present time flight attendant pre-landing announcements request that passengers bring their seatbacks up, lock tray tables, stow loose articles, and fasten their seatbelts. The Safety Board believes that passengers need to be reminded of other safety features before landing, especially on flights that may last for several hours and extend through several time changes, resulting in passengers becoming lethargic or otherwise less alert than when they first boarded the airplane. The Safety Board believes that an unreasonable burden would not be placed upon flight attendants to make a pre-landing announcement early in the descent for landing with the following information: (1) passengers note the exit nearest to them and alternate exits, (2) the location and operation of flotation devices if the approach is to be over water, and (3) a request that passengers refer to their safety cards for instructions on the exit routes and the operation of exits.

An FAA sponsored study in 1978 found six variables which determined whether passengers would pay attention to presentations of safety information: (1) the way the information was presented; (2) apparent response of other passengers to the presentation; (3) the passenger's perception of the probability of an accident, (4) the relative adequacy of the oral briefing; (5) situational and environmental determinants; and (6) the passenger demographics. The study recommended to the FAA that additional research would be necessary to fully explore and define several unanswered questions of human behavior as it pertained to passengers' motivation to accept safety information. The Safety Board is greatly disappointed that in the seven years since this study the FAA has not pursued the recommendations to better define passenger behavior to first, better understand why passengers do not pay attention to safety information, and second, explore methods to modify the behavior of passengers so that they will accept the importance of safety information.

Neither the Federal Aviation Administration nor the airline industry have quantitative criteria to test the comprehensibility of safety instructions or whether the instructions can be followed in an emergency.

The Federal Aviation Regulations require merely that passengers be "orally briefed" on the location of emergency exits before each flight. However, for many years airlines have directed flight attendants to physically point to each emergency exit during the

pre-takeoff safety briefings. The Safety Board believes that this practice is an effective way of informing passengers where each exit is located relative to each passengers' seat. Nevertheless, the Safety Board is disturbed that its investigators have observed that at least two U.S. airlines have discontinued this practice and instead ask that passengers refer to their safety cards for the location of the emergency exits. The Safety Board is concerned that this practice may establish an undesirable precedent that other airlines may follow. In 1972 the Safety Board issued a safety recommendation to the FAA to amend 14 CFR 121 to require that emergency exits be physically pointed out before each flight so that passengers would better know the location of exits. The FAA disagreed by stating that the regulations were adequate without the requirement to physically point to each exit; the status of this recommendation is "Closed--Unacceptable Action." In view of the findings of this study which show that passengers should be given clear and unambiguous instructions of the location and operation of safety equipment including the location of exits, and in view of the practice of at least two airlines to no longer require flight attendants physically point to exits, the Safety Board urges the FAA to reconsider this earlier safety recommendation.

Federal Aviation Regulations for Parts 121 and 135 operations provide minimum requirements for conveying safety information to passengers. FAA Advisory Circulars (AC) and Air Carrier Operations Bulletins (ACOB) provide general guidance to air carriers and to FAA inspectors for developing flight attendant oral safety briefings and safety cards. However, the Safety Board found that this guidance does not always adequately address methods to convey safety information in a factual, concise, unambiguous, and readily understood manner.

AC 135-12 for Part 135 Commuter/Air Taxi operators provides much better guidance and more specific information than does AC 121-24 for Part 121 operators. For example, guidance for an oral briefing includes pointing out exits, instructions for adults to don oxygen masks prior to placing them on their children, and instructions for crewmembers not to be assigned service-related duties during the briefing. Some of the safety card guidance that is contained in AC 135-12 but is not contained in AC 121-24 includes the use multi-colored cards, encouraging passengers to be familiar with exits other than the one they entered, instructions for placement of the exit hatch after it is removed, prohibiting removal of carry-on baggage during an evacuation, instructions for use of evacuation slides, adult donning of oxygen mask before children, and the removal of a flotation device from its pouch.

The Safety Board believes that AC 135-12 provides more guidance for flight attendant's oral briefings and for safety cards than does AC 121-24; however, neither Advisory Circular provides guidance in how to don a child's life preserver, nor do they address protective or brace positions for infants and children. The Safety Board believes it is necessary to depict this important information on safety cards and that the FAA should provide appropriate guidance in both Advisory Circulars.

FAA's Principal Operations Inspectors are responsible for assisting air carriers with the development of briefing cards, approving the cards and any changes thereto, as well as inspecting the cards during enroute cabin inspections. Many of the cards examined in the special study did not meet the goals established by the FAA's Advisory Circular and Air Carrier Operations Bulletins. The Board is disturbed that FAA inspectors have approved these safety cards, which contained information contrary to the FAA's own guidance. The Safety Board is aware that the Advisory Circulars and Air Carrier Operations Bulletins have major shortcomings; nonetheless, they are the only sources of guidance to FAA

inspectors, and as such, the Board is concerned that this guidance has not been applied in a standardized manner. The Safety Board is further concerned that neither the training given to FAA inspectors nor their on-the-job experience has apparently adequately prepared them to assist air carriers with development and preparation for approval of safety cards and other safety briefings.

Some flight attendant training programs include assertiveness training to assist in developing leadership skills which may be necessary during non-routine situations or emergencies. However, most air carrier flight attendant training programs do not provide leadership training or training in passenger behavior; this is unfortunate because these topics could be most beneficial and result in more effective safety briefings by the flight attendants as well as helping flight attendants to identify those passengers who could assist during emergencies.

During 1974 and 1975 in a series of Flight Safety Foundation articles, various personalities of passengers were classified to illustrate to flight attendants the wide range of behaviors which must be considered when any kind of safety instructions are given to passengers, as well as the behaviors which may be exhibited by passengers in emergency situations. Human behaviorists have suggested that variations in human behavior also could be included in flight attendant training to further prepare them to recognize those passengers who may be of assistance and those passengers who may exhibit maladaptive behaviors in stressful situations. This type of training may also serve to illustrate some reasons why passengers may or may not pay attention to safety briefings and thus provide insight to flight attendants and airline managers into possible methods of improving the passenger's attentiveness to the briefings.

The behavior of the flight attendants can influence both positively and negatively passengers' perception of the flight attendants' role as safety professionals and can thus affect the passengers' motivation to pay attention to safety information. The Safety Board believes that initial and recurrent training should ensure that flight attendants remain aware of their vital role on how they can influence passenger acceptance of safety information. It is clear that improper use of the public address system cannot only greatly detract from the understandability of an announcement, but can also be perceived by passengers as an announcement which contains no worthwhile information. Airlines should encourage flight attendants to speak slowly with good diction and with an interesting and pleasing voice. The Safety Board believes that airlines could develop and periodically change innovative opening sentences to their briefings to gain the attention of passengers. Unfortunately, the quality and the fidelity of public address systems on some airplanes and the location of the audio speakers can negate even the best crew announcement both on the ground during the pre-takeoff briefing and during flight.

The poor quality of PA systems has been a concern to the Safety Board for several years and in response to Safety Board recommendations manufacturers have improved both the fidelity of the systems and increased the numbers of speakers in newer and refurbished airplanes. However, ineffective systems are still present in some airplanes and the passengers' ability to hear and to understand safety instructions on the ground and inflight continues to be a problem. While it can be readily appreciated that an unintelligible PA system will prevent passengers from hearing or understanding the information, these announcements can also irritate the passengers because they do not know what is being said and, thus, can adversely affect their perceptions as to how that airline views safety information. Thus, no matter how well the safety briefing is

presented and how understandable the instructions may be, the overall effectiveness and passenger attentiveness to and acceptance of the information will be lost because of a poor quality PA system.

Applied research also demonstrated that after a loss of cabin pressure passengers could be given instructions for the use of supplemental oxygen by tape recorded messages broadcast over an airplane's public address system. These messages would be given following a loss of cabin pressure when flight attendants would be required to remain seated and to wear oxygen masks and thus be unable to provide any assistance to passengers. Although this kind of automatically broadcast safety message has been available on wide-bodied airplanes as a customer option for over 15 years, its use is not widespread.

From 1962 to 1985, the Safety Board issued 33 safety recommendations which addressed the content, accuracy, and effectiveness of the methods used to convey safety information to passengers. Of these, 28 were made to the FAA and the airline industry and the other 5, which concerned public address systems specifically, were made to the FAA. A recommendation issued in 1983 requested that the FAA sponsor a government-industry task force to examine the issue of passenger safety information and to take action to correct shortcomings. In response to these recommendations, the FAA informed the Safety Board that the Federal Aviation Regulations adequately addressed the issue, that a 1979 FAA sponsored research report adequately addressed passenger attentiveness, that two Advisory Circulars provided adequate guidance for safety briefings, that FAA inspectors who inspect and approve safety information had been provided with sufficient guidance to carry out their responsibilities, and that the Society of Automotive Engineers had published suitable guidance for safety briefings. In 1983 (and again in 1985) the Safety Board informed the FAA that nonetheless there was a problem, and that the FAA was not being responsive to the recommendation. The Safety Board believes that the FAA should be the catalyst for research on why passengers do not pay attention to safety information and if they do, why passengers may not understand and retain all the information which is presented. Furthermore, the Safety Board believes that the FAA should develop criteria and tests which can demonstrate that persons who represent typical airline passengers actually can perform in a timely manner the tasks which are described, such as donning life preservers, activating oxygen systems, and opening exits.

As a result of its Safety Study on Passenger Safety Education, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Develop methods to improve passenger motivation to listen to safety information. (Class III, Longer Term Action) (A-85-93)

Develop tests and standards which describe the minimum level of acceptable comprehension and performance to measure whether persons who represent typical passengers understand the safety information presented during oral briefings and demonstrations, on safety cards, and in videotaped briefings, and whether these persons actually are able to perform the actions described, such as using supplemental oxygen system, using life preservers, and opening of exits. (Class III, Longer Term Action) (A-85-94)

Revise, based on the results of testing of passenger comprehension of safety information and performance of emergency procedures, the Advisory Circular

entitled "Passenger Safety Information Briefings and Briefing Cards" (AC-121-24, dated June 23, 1977, and AC-135-12, dated October 9, 1984) to include improved guidelines on the content and presentation methods used in oral and videotaped safety briefings, and for pictorial and printed information on safety cards. (Class III, Longer Term Action) (A-85-95)

Revise, based on the results of testing of passenger comprehension of safety information and performance of emergency procedures, Air Carrier Operations Handbooks and Bulletins and air carrier inspector training programs to include instruction to prepare FAA inspectors to provide better guidance to airlines when assisting them in improving the content and presentation of passenger safety information to their passengers. (Class III, Longer Term Action) (A-85-96)

Revise Advisory Circulars 121-24, dated June 23, 1977, and 135-12, dated October 9, 1984, to provide guidelines covering the following items in briefings and demonstrations: adults donning oxygen masks before placing masks on accompanying children; fastening an adult size life preserver or personal flotation device on a child; and brace positions for children. As an interim measure, issue an Air Carrier Operations Bulletin to assist FAA inspectors in providing better guidance to airlines. (Class II, Priority Action) (A-85-97)

Amend 14 CFR 121 to require pre-landing safety announcements to reinforce the pre-takeoff briefings on release of seatbelts, the location of exits, the location and operation of life preservers (in the case of overwater landings), and to urge passengers to refer to safety cards prior to landing. (Class II, Priority Action) (A-85-98)

Amend 14 CFR 121 to require, on airplanes which are equipped with life preservers, that the safety briefings include demonstrations of how to open the life preserver's sealed protective pouch. (Class II, Priority Action) (A-85-99)

Require that automatically activated safety messages be used for explaining the operation of the supplemental oxygen systems following loss of cabin pressurization in all newly manufactured air carrier airplanes and after a specified date, in all other air carrier airplanes which operate under 14 CFR 121. (Class II, Priority Action) (A-85-100)

Require that recurrent flight attendant training programs contain instructions on the use of the public address system and techniques for maintaining effective safety briefings, and demonstrations which will improve the motivation of passengers to pay attention to the oral briefings and to the demonstrations. (Class II, Priority Action) (A-85-101)

Require airlines to include, during initial and recurrent flight attendant training programs, information on how personality and behavior of passengers can be manifested in non-routine and emergency situations; and to provide instruction on how flight attendants can compensate for these interpersonal dynamics when they must assign duties to passengers in emergencies. (Class II, Priority Action) (A-85-102)

Develop a program to test the feasibility, effectiveness, and passenger acceptance of providing safety briefing information in airport terminal gate areas, and of providing printed safety information on or inside ticket envelopes. (Class III, Longer Term Action) (A-85-103)

Explore the feasibility of providing public service messages in the media which acquaint air travelers with safety features aboard air carrier airplanes. (Class III, Longer Term Action) (A-85-104)

The Safety Board reiterates the following recommendations to the Federal Aviation Administration:

Sponsor a government/industry task force open to foreign participants made up of representatives from the airplane manufacturers, air carrier and commuter operators, researchers, flight attendants, and consumers (1) to identify the type of safety information that is most useful and needed by passengers, (2) to identify and develop improved instructional concepts for conveying the safety information, and (3) to recommend appropriate changes to the operating requirements regarding passenger oral briefings and information briefing cards. (Class II, Priority Action) (A-83-45)

Federal Aviation Regulation 121.571 be revised to state that the appropriate crewmember must physically point out the location of all emergency exits on each aircraft prior to each takeoff. As a general rule passengers do not listen to the oral announcements, this was testified to during the public hearing relative to this accident. However, passengers will tend to watch a flight attendant who physically points out the area of exits and will retain therefore a general idea of the location of such exits particularly those nearest to them. (A-72-128)

Issue a maintenance bulletin calling attention to the need for properly functioning public address systems to assure that safety messages by the crew are understandable in all parts of the cabin both on the ground and in flight (A-82-71).

BURNETT, Chairman, GOLDMAN, Vice Chairman, and BURSLEY, Member, concurred in these recommendations.

By: 
Jim Burnett
Chairman