



## Crew Efforts Help Passengers Comprehend Safety Information

*By optimizing communication methods and checking for expected behavior, flight attendants help ensure that passengers will know what to do during an aircraft emergency.*

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*FSF Editorial Staff*

Cabin safety specialists agree that most passengers require motivational prompting to focus their attention on airline safety-briefing information. The current system of oral/audio/video briefings and briefing cards also must enable as many passengers as possible to comprehend this information — with cabin crew follow-up as required for explanations or supplementary information in a specific situation. How to judge whether the content and presentation of briefings have been effective — other than by findings in the wake of an accident or incident — has been a point of continuing disagreement, however.

“[Trained cabin crewmembers] provide passenger-management functions, intended to produce fast and effective evacuations,” said the Civil Aviation Safety Authority of Australia (CASA) in current guidance for airlines. “Individual passengers have a large, (typically negative) impact on the conduct of emergency evacuations, resulting from their general naiveté regarding aircraft emergencies and ignorance of proper procedures needed to cope with such circumstances.”<sup>1</sup>

CASA said that cabin crews should aim to eliminate distractions to passengers, and should conduct each pretakeoff briefing “so that each passenger can clearly hear it and easily see the required demonstration.” Among recommended methods for cabin crews to increase comprehension among passengers are speaking slowly and distinctly, being animated and making eye contact with as many passengers as possible. Individual briefings also provide passengers in exit rows the opportunity to



ask questions about the exit operation and emergency procedures, CASA said.

“Benefits to the crew include being better able to ascertain if passengers occupying exit-row seats are able to understand crew commands and are capable of performing the function [of assessing exterior conditions and opening the exit] if required,” CASA said.

The U.K. Air Accidents Investigation Branch (AAIB) found that misunderstandings about the emergency oxygen system increased passengers’ anxiety when cabin depressurization occurred in an Airbus A320 during a flight over the English Channel.<sup>2</sup> The subsequent descent, turnback and landing at London (England) Gatwick Airport were uneventful. The preflight safety-briefing video had covered the use of the emergency oxygen masks; adhering to instructions to “pull the mask sharply downward,” some passengers detached their masks from oxygen generators. The maximum aircraft altitude was about 28,600 feet when the cabin-pressure warning system sensed a cabin altitude greater than 9,550 feet.

“The cabin altitude peaked briefly during the event at 14,000 feet and was above 9,000 feet for some seven minutes and 30 seconds,” the AAIB report said. “Although most [of the 176 passengers] were aware of some of the information from the preflight safety-briefing video, for most, the details were forgotten. ... Initially, the cabin crew donned their oxygen

masks and called to passengers to do the same. One [cabin crewmember] saw that some passengers were simply staring at the masks, and she shouted at them to grab a mask.

“The deployment of the oxygen masks, some tangled, and the smell of the hot oxygen generators coupled with confusion on the use of the masks and a lack of confidence in the system performance created for some a state of high anxiety. ... Some of the passengers who felt that they were not getting any [oxygen] flow pulled on the tube itself, and a few pulled the tube off the [oxygen-generator] canister.”

After the emergency descent, a cabin crewmember used the public-address (PA) system to make a standard announcement to passengers that a “reduction of cabin pressure” had occurred, that the aircraft had descended to a lower altitude and that the burning odor was caused by normal operation of oxygen generators. The aircraft was not equipped with a recorded message to instruct passengers after deployment of the oxygen masks. The normal release of chalk dust when the oxygen masks deployed disturbed some passengers. On command from the captain, the four cabin crewmembers retrieved portable oxygen supplies and moved around the cabin assisting passengers.

AAIB found that passengers had varying recollections of the preflight briefing, briefing card and cabin crew response to the decompression.

“Recollection was [weak] (20 to 30 percent) on the topics of securing the mask (pulling the elastic band tight), fitting one’s own [mask] first before helping others and breathing normally once the mask had been fitted,” the report said. “The lack of a reminder [from cabin crew] about the emergency oxygen masks and about details of [their] operation probably contributed to the difficulties, perceived and real, that the passengers experienced.”

Misunderstandings were evident in passengers’ subsequent responses to a postincident survey, the report said:

- “[Passengers’] principal concern was about the adequacy of the rate of oxygen flow;
- “[In the survey,] 28 percent of the responding passengers said that they had problems fitting or securing the masks to their faces;
- “Three [out of 49 responding passengers who had assisted other passengers] had difficulties in providing assistance because they had been unable to secure their own masks;
- “Some passengers were disturbed by the release of dust, ... by the entanglement of the masks and tubes, by the brown color of the lower section of the delivery tube and by the pungent smell created by the hot [oxygen-generator] canisters; [and,]

- “Some 95 percent of responding passengers reported that they lacked confidence in the operation of the emergency-oxygen system.”

Investigating a separate occurrence, AAIB found that a similar absence of clear information in the passenger briefing or briefing card contributed to passengers’ inability to descend safely from an aircraft wing after an evacuation.<sup>3</sup> The evacuation was ordered one minute 40 seconds after the flight crew detected a burning odor while taxiing for takeoff at Manchester (England) International Airport and shut down the engines; the cabin crew also detected smoke in the cabin and told the captain.

“Passengers seated at rows 14 and 15 had been briefed on the operation of the overwing escape hatches prior to departure,” the report said. “However, as [the third cabin crewmember] was unable to return to her emergency station at seat 15D, these passengers had to open the hatches without further guidance. Having climbed out of the cabin onto the wing, passengers disembarking from the left overwing exit were unsure of how to descend from the wing to the ground. A number congregated on the wing looking for a way down. [Some passengers thought that the absence of a slide was the result of a system failure.] Cabin crew eventually noticed the confusion and urged the passengers to get off the wing. Some passengers slid or jumped from the wing tip and leading edge (a drop of some 7.0 [feet] to 8.0 feet [2.1 meters to 2.4 meters]) instead of sliding off the wing trailing edge down the extended flaps. ... This escape route is depicted on the passenger safety card ... in a diagram of the entire aircraft and is quite small and not easy to discern.”

The Transportation Safety Board of Canada (TSB) cited in 1995 the following examples of airline passengers’ apparent failures to comprehend crewmember instructions and expectations:<sup>4</sup>

- A passenger failed to respond to a cabin crew command to open the overwing exit, and a second passenger obstructed passenger egress by placing this hatch inside the aircraft. “The hatch was later removed by a cabin attendant who, at that point, took control and oversaw the evacuation at the left overwing exit,” TSB said; and,
- When a captain’s PA command to evacuate the aircraft from a position close to a gate “did not convey any sense of urgency,” the cabin crew did not shout evacuation commands and passengers did not understand what was expected. “Finally, the aft cabin attendant realized that the passengers were unaware of the need to evacuate the aircraft and began shouting the standard evacuation commands in a loud voice,” TSB said. “Her actions were effective.”

A 2003 AAIB report found that guidance was absent from safety briefings, briefing cards and cabin crew commands on how to evacuate infants and small children on escape slides.<sup>5</sup>

“During the evacuation, some uncertainty arose between passengers and crew as to the best method of evacuating small children or infants down the escape slides,” the report said. “A

recent [U.S.] study ... ([*Caring for Precious Cargo, Part I: Emergency Aircraft Evacuations With Infants Onto Inflatable Escape Slides*,] DOT/FAA/AM-01/18) concluded that the most rapid evacuations were achieved when children between the ages of two [months] and 24 months were held by an adult who then jumped onto the slide.”<sup>6</sup>

Nearly 20 years ago, the U.S. National Transportation Safety Board (NTSB) said, “A 1970 study found that persons believed that safety information need only be assimilated during an actual emergency situation. ... Given the typical behavioral response of passengers to emergency situations, it is evident that the content of the briefing material must be clarified to the greatest extent possible, so that passengers know what is expected of them in an emergency.”<sup>7</sup>

NTSB periodically has recommended that the U.S. Federal Aviation Administration (FAA) conduct research on the effectiveness of current passenger-briefing technologies (oral/video/audio/card) and on passenger comprehension of briefing cards.<sup>8</sup> For example, NTSB Recommendation A-85-94 said that FAA should “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 systems, using life [vests], and opening of exits.”

In 1989, FAA said that “a logical process is being followed to ensure acceptable levels of comprehension by passengers [and] ... the testing process used for the safety cards does include assessments of ease of reading, logic and comprehension.” Moreover, FAA said in 2000 that air carriers’ current methods of providing passenger-safety information are effective, and that air carriers should be encouraged to improve them, but further research on effectiveness is not required.

Nevertheless, NTSB said in 2001 and 2004, “[NTSB] is unaware of any research or studies that have compared or evaluated how effective the current technologies are when used in safety briefings. For example, [NTSB] would like to know whether passenger attention and knowledge retention of a video safety briefing have been objectively compared with a safety briefing by a live flight attendant. ... [NTSB also] notes that the FAA does not have any current plans to mandate the comprehension testing of passenger safety briefing cards as requested in Safety Recommendation A-00-87.”

Some passengers who experienced evacuations and were surveyed by NTSB said that they would have preferred evacuation-specific information — such as exit routes and details about how to slide or how to get off wings — to the standard passenger-safety information.<sup>9</sup>

“With the exception of [video presentation], there has been little change over the years in how safety information has

been presented to passengers,” NTSB said in 2000. “[NTSB] concludes that despite guidance in the form of FAA advisory circulars, many air carrier safety-briefing cards do not clearly communicate safety information to passengers.”

Optimizing communication technology in the cabin requires consistent attention by the cabin crew to the performance of PA systems and video-presentation systems.

“Crews are instructed and critiqued on their ability to speak slowly and clearly and to articulate [PA] announcements in a professional manner designed to gain and maintain the attention of passengers,” NTSB said. “Unfortunately, the quality and fidelity of PA systems on some airplanes and the location of the audio speakers can negate even the best crew announcement both on the ground during the pretakeoff briefing and during flight.”

The following recommendations — currently published by FAA to promote comprehension of safety information by the greatest number of passengers — complement those above:<sup>10</sup>

- During a passenger-safety briefing, the airline should not assign, and cabin crewmembers should not conduct, non-safety-related duties that could distract passengers from listening or could block passengers’ observation of a safety demonstration;
- Passengers’ attention explicitly should be directed to briefing cards, emphasizing that review of the briefing cards is important because they provide additional safety information;
- Although audio/video presentations help to ensure consistent, high quality and complete briefings with speakers using good diction, multiple languages and captioning for passengers who are deaf, hard of hearing or have difficulty understanding the crew’s language, the cabin crew must ensure that playback equipment functions as designed for correct volume, clarity of screen images and a complete, uninterrupted presentation;
- Operators should have alternate briefing procedures ready for use anytime a recorded presentation becomes inoperative;
- The national language(s) used for oral briefings, oral commands and briefing cards (including cards specifically for exit rows) should be the same;
- Cabin crew (or other appropriate crewmembers) must brief individually any “passenger who may need assistance in moving expeditiously to an exit” and any attendant who is accompanying the passenger. The briefing items comprise the most appropriate route to an exit and the most appropriate time to begin moving toward that exit; the crewmember also must ask the passenger/attendant “the most appropriate manner to prevent pain and further injury”; [and,]

- Extraneous information — that is, not essential to cabin safety — should be excluded from oral briefings and briefing cards.♦

### Notes

1. Civil Aviation Safety Authority, Australia. *Passenger safety information: Guidelines on content and standard of safety information to be provided to passengers by aircraft operators*. Civil Aviation Advisory Publication [CAAP] 253-2(0), August 2004.
2. U.K. Air Accidents Investigation Branch (AAIB). *AAIB Bulletin no. 7/2002, Airbus A320-231, G-DJAR, 10 June 2000*. July 2002. The incident occurred at 1333 coordinated universal time (UTC). The six aircraft crewmembers were not injured; minor injuries were reported by some of the 176 passengers. An aircraft air conditioning duct and a non-return valve were damaged.
3. AAIB. *AAIB Bulletin no. 3/2003*. The incident at 0516 UTC on April 1, 2002, involved a Fokker F28 Mark 100 (Fokker 100) during taxi at Manchester International Airport, England. Six of the 89 passengers received minor injuries and none of the five crewmembers were injured; the auxiliary power unit was damaged.
4. Transportation Safety Board of Canada. *A Safety Study of Evacuations of Large, Passenger-Carrying Aircraft*. Report no. SA9501, 1995.
5. AAIB. *Aircraft Accident Report no. 4/2003 (EW/C2001/5/1)*. 2003. The report said that the right-main landing gear collapsed May 10, 2001, at 1232 UTC, when the McDonnell Douglas (Boeing) MD-83, operated by Spanair, was landed at Liverpool (England) Airport. The aircraft had 170 passenger seats and had six crewmembers and 45 passengers aboard. Among causal factors were “application of spin-up drag loads on a section of the [gear] cylinder containing a major fatigue crack ... and several other associated smaller cracks.”
6. FSF Editorial Staff. “Report Recommends Jumping Onto Evacuation Slide as Best Egress Method for Adults Carrying Infants and Young Children.” *Cabin Crew Safety* Volume 37 (May-June) 2002.
7. U.S. National Transportation Safety Board (NTSB). *Airline Passenger Safety Education: A Review of Methods Used to Present Safety Information*. Report no. NTSB/SS-85/09. Oct. 25, 1985.
8. NTSB. *Safety Recommendation A-00-086 (Closed-Unacceptable Action, May 5, 2004)*. The recommendation, from a series in NTSB’s 2000 safety study of commercial airplane evacuations, said, “Conduct research and explore creative and effective methods that use state-of-the-art technology to convey safety information to passengers. The presented information should include a demonstration of all emergency evacuation procedures, such as how to open the emergency exits and exit the aircraft, including how to use the slides.”
9. NTSB. *Emergency Evacuation of Commercial Airplanes*. Safety Study no. NTSB/SS-00/01, June 27, 2000.
10. U.S. Federal Aviation Administration (FAA). *Advisory Circular 121-24C, Passenger Safety Information Briefing and Briefing Cards*. July 23, 2003.

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