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Rapid Deplaning by Airbridge Requires Coordinated Procedures

The decision to use an airbridge for precautionary deplaning or emergency evacuation at the gate rests with the aircraft captain. The U.K. Civil Aviation Authority recommends that airports be involved in coordinating procedures used by crewmembers, gate agents, airbridge operators and aircraft rescue and fire fighting personnel.

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FSF Editorial Staff

Rapid deplaning via airbridges occurs rarely, based on the experience of the U.K. Civil Aviation Authority (CAA) and the U.S. Federal Aviation Administration (FAA). When circumstances warrant this precautionary action, however, miscommunication or failures in coordination may compromise safety. Airbridges, the term used by CAA, commonly are called passenger-loading bridges, jetbridges and jetways in other countries. They are installed at airport gates to provide movable, telescoping-tunnel sections with an adjustable canopy that is docked against the main boarding door(s) of an aircraft to provide a secure and weather-tight connection between a specific gate area and the aircraft.[1]

To conduct rapid deplaning, the captain typically directs passengers to exit the aircraft via the boarding door(s) without retrieving their carry-on baggage. Research could not be found about the average time required to complete this procedure, compared with the time required to complete an evacuation using all emergency exits and slides.

In the United States and the United Kingdom, the captain is primarily responsible for deciding whether to order an evacuation at the gate. Depending on the urgency of the situation, the captain may consider rapid deplaning when an airbridge is docked to the airplane or located nearby. (Many flight attendants also have training, procedures and authority to initiate an evacuation if communication with the captain fails and emergency conditions require immediate action.) The captain's decision involves analysis of risks according to the air carrier's evacuation guidance and procedures, which take into consideration the known likelihood of injuries to some passengers during an evacuation via overwing exits and slides.[2]

A review of several aviation safety databases showed that rapid deplaning via an airbridge has been ordered by captains for the following reasons:

- Bomb threat on a McDonnell Douglas DC-9;[3]
- Engine fire observed by ground personnel on a Fokker F28 Mk 100;[4]
- Smoke in the cabin of a three-engine large transport aircraft;[5]
- An aft-cargo smoke warning on an Airbus A320 without indications of smoke, fumes or heat;[6] and,
- Introduction to a McDonnell Douglas DC-9-82 cabin of exhaust fumes from an electrical ground-power cart;[7]

Evacuations using slides only — or using a combination of slides, overwing exits and airbridge(s) — also have been conducted at the gate in the following scenarios:

- Smoke in the cockpit of a Boeing 737 during pushback;[8]

- Dense smoke in the cabin during normal deplaning of a Boeing 727;[9]

- Smoke and fire, observed by ground personnel, emanating from the right wheel well of a McDonnell Douglas DC-9-51 just prior to pushback;[10]

- Repairs at the gate to an airplane hydraulic line, during which a spray of hydraulic fluid was ingested by the auxiliary power unit and produced heavy smoke in the cabin and the flight deck of a Boeing 727-251;[11] and,

- Indications of fire, reported by the flight crews of nearby airplanes, in the tail of a two-engine medium transport airplane located 30 feet to 45 feet (nine meters to 14 meters) from a gate.[12]

The following occurrences — in which captains said that they would use a retracted airbridge for rapid deplanement, but were unsuccessful in getting ground personnel to reattach the airbridge to the aircraft — have been reported in the United States:

- "Shortly after pushback, it was noticed that [one of the engine-door handles of the Boeing 737-222] was not flush. The engine was shut down, and ground maintenance personnel closed the door from the outside. The cabin then began to fill with dense smoke. The captain, using radio and an open window [for communication], was unsuccessful in getting a jetway reattached to the airplane, and the crew and passengers exited using slides. … The airplane had been pushed back at Gate B-8 and had received clearance to Gate B-20 for the evacuation. There was no jetway operator present, and ground personnel are not cross-trained to operate a jetway. [Two minor injuries to passengers occurred.] … [The probable cause was] the failure of the flight crew to follow emergency procedures/ directives. [Contributing] factors were the failure of the aircraft electrical system (relays) and the failure of the company to provide a jetway operator";[13] and,

- "Immediately upon brake release for pushback from the gate, the lead flight attendant opened the cockpit door and stated [that] there was an unusual odor in the cabin [of the three-engine large transport aircraft]. The captain told the [tug] driver to hold the push and sent the [second officer] to investigate. The [second officer] returned almost immediately and stated there was a strong odor of burning electric [material]. The second officer returned to the cabin to investigate further. The captain called the operations control center and told them [that the aircraft] had electric fumes and requested [that] they have the gate agent return the jetway to the aircraft. The second officer returned to the cockpit and stated he had not located a source, but several passengers sitting mid-cabin overwing [had] reported to him [that] they had seen a small amount of smoke come out [of] the gasper [fresh air] vents. The captain made the decision to deplane the passengers. As the jetway had still not been brought up to the aircraft and [the crew] could see the gate agents at the podium, the first officer called operations and requested the jetway immediately. A call was then made to ground control (air traffic control [ATC]) requesting [that] aircraft rescue and fire fighting (ARFF) respond to the aircraft. The captain made a public-address [announcement] to the passengers telling them [that the crew was] planning to deplane [the passengers] through the main cabin door and that, as a precaution, the fire department would be responding. As the jetway was still not moving, the lead flight attendant recommended [that] the aft stairs be lowered. The captain requested [that] the tug driver have the ground crew lower the aft stairs and also asked if the tug driver could operate the jetway. The tug driver had the stairs lowered and proceeded to operate the jetway. Another request was made to operations control for an agent. The fire department arrived at the aircraft before a gate agent [arrived]. Passengers deplaned through the main cabin door without incident. The cause of the smoke and fumes was a shorted gasper-fan motor. ATC [response] and ARFF response [were] excellent with no hesitation. The most frustrating thing in this incident was the lack of response from the company operations control center. Even after [the crew's] third request, they questioned [the crew's] need for an agent. It wasn't until [the crew] told them … ARFF was en route that they took action."[14]

Airports generally do not the oversee crewmembers, gate agents, airbridge operators or ground-handling personnel who respond directly to emergencies at the gate. Nevertheless, airports can influence applicable policies, procedures and training — including those involving ARFF services, according to CAA, FAA and Airports Council International (ACI), which represents more than 500 airports and airport authorities worldwide.

CAA recommends, for example, that airports establish systems for training, testing and licensing airbridge operators; auditing operator competency and adherence to standard operating procedures; conducting operational daily inspections; reporting/investigating airbridge incidents and major airbridge malfunctions; scheduling preventive maintenance of airbridges; and coordinating an immediate response by airport maintenance/operations staff to airbridge malfunctions to maintain safe passenger handling and safe aircraft operations.[15]

CAA said that airport aprons, under normal conditions, are places where "vehicles, equipment and people are engaged in a time-pressured and often congested environment requiring an efficient safety-management system to permit the safe and effective operation of aircraft handling and ramp activities." Nonroutine occurrences — such as rapid deplanement via airbridge or aircraft evacuation — complicate further the requirements of safety management.

ACI recommends that airport operators, air carriers and ground-handling agents maintain ongoing communication about apron equipment, procedures, training, operational hazards and maintenance through regular meetings and through specific channels for immediate communication about problems and emergencies.[16] ACI considers airbridges a safety resource specifically in the context of refueling aircraft with passengers on board.

"Embarkation stairways on aircraft should be let down or mobile stairways should be positioned at each of the main doors normally used for passenger embarkation or disembarkation," ACI said. "These doors should be kept open and clear; if closing them is necessary for climatic or operational reasons, they must remain unlocked when refueling with passengers on board. A cabin attendant should be stationed at each door. The use of aircraft stairs or separate stairways is unnecessary when passenger-loading bridges are used. When only one passenger-loading bridge is available, the other main door(s) should be unobstructed by ground equipment to permit the use of the escape slide at that door. An adequate number of cabin attendants who are in communication with the flight crew should remain in the aircraft at all times, at or near the primary means of exit, to control and direct an evacuation should the need arise."

In the United States, U.S. Federal Aviation Regulations (FARs) generally require that equipment, personnel and procedures be provided at all times for evacuating passengers using floor-level exits during an emergency at the gate, said Nancy Claussen, an FAA cabin safety inspector in Phoenix, Arizona, U.S.[17]

For example, Part 121.570 requires that any time there are passengers aboard the airplane, one door must be ready for evacuation. At the moment the airbridge or stairs are retracted from the airplane, at least one door must be armed — that is, for certain slide/raft installations, the girt bar must be in place. (A girt, the device typically used to attach an emergency evacuation slide/raft to an airplane, consists of strong fabric wrapped around a girt bar, which is installed in the doorsill of an exit.)

"A problem that happens after that point would require a precautionary deplaning or an emergency evacuation," Claussen said. "Some airlines have prepared for the rapid-deplaning scenario, but I do not see a lot of precautionary procedures in place that rely on ground personnel or equipment. Precautionary deplaning is a relatively rare event."

FAA's distinction between rapid deplaning and an emergency evacuation mirrors FARs that allow temporarily a reduced number of flight attendants during an intermediate stop, she said.[18]

"[Part] 121.393 contains specific parameters on what needs to be in place — essentially a very controlled and static environment in which all remaining onboard passengers are continuing on to the next destination and no other passengers are boarding or deplaning — to reduce the number of flight attendants," she said. "At all other times, the full flight attendant complement is needed because the crewmembers are solely responsible for evacuating the aircraft during the majority of time the aircraft is on the ground. Other people on the ground such as jetway operators are safety resources, but the crew is responsible."

FAA requires command-and-control procedures between flight crews and ground personnel to be effective under various emergency scenarios, but does not prescribe the form or manner of communication, she said.

"If a pilot or flight attendant wants to use a jetway, stairs or ground personnel, that decision is a matter of their judgment," she said. "FARs are not designed to require airlines to use the same methods. Even if a jetway is in place, flight attendants will be assessing all exits.[19] If the terminal structure or ground equipment is too close for safe use of slides, flight attendants will consider the affected exit blocked and use others; the same procedures apply whether the aircraft on the ground is at the gate or not at the gate. They assess conditions and listen for specific direction from the captain. They judge the urgency, assess conditions and initiate the evacuation whether or not the aircraft is attached to a jetway."

As a result, U.S. air carriers typically develop deplaning checklists appropriate to their respective operations, she said.

"The optimum environment in terms of space for the use of evacuation slides is out on the runway; nevertheless, obstacles and apparent hazards are not considerations only at the gate," Claussen said. "Commands must be adjusted to take into account the apron environment. If a true emergency occurs after the jetway has been retracted, there is no time to incorporate the use of jetways or stairs; all required means of evacuation must be ready at all times."

FAA does not regulate the training of gate agents or airbridge operators but reviews air carrier policies, procedures and training programs for these job functions, Claussen said.

Three airport-safety specialists in the United Kingdom said that clear understanding of the issues of precautionary deplanement and emergency evacuation at the gate improves passenger safety. CAA has developed several advisory documents that reflect current government-industry thinking about these subjects. No safety incidents involving the use of airbridges for rapid passenger deplanement have been reported since the most recent material was distributed in 1998.[20]

Civil Aviation Publication (CAP) 642 *Airside Safety Management* contains recommendations on the use of airbridges; the recommendations were developed by the Airside Safety Management Working Group. CAP 642 complements CAP 168, *Licensing of Aerodromes*.[21]

"In model orders for airbridge operators in the latest amended version of CAP 642, there is no reference to emergency reconnection of the airbridge," said Gordon Walker, a CAA

aerodrome inspector in Manchester, England, and a member of the Airside Safety Management Working Group, which is revising CAP 642. Airports have regulatory flexibility to develop such procedures, he said.[22,23]

"CAP 168 is the document that implements parts of International Civil Aviation Organization Annex 14, *Aerodromes,* in the United Kingdom," Walker said. "When additional guidance is considered necessary, notices are issued to all airport licensees; notice no. 2 in 1998 addressed passenger safety and airbridge operations."

For the past six years, CAA has promoted safety-management systems in which airports assume an active role in ground-safety issues rather than relying solely on the regulator to inspect them, Walker said.

"CAP 642 seeks to broadcast the best possible practice, but it is not exhaustive; inspectors, while taking CAP 642 into consideration, do not audit/inspect prescriptively by it," Walker said. "There is little or no other guidance on precautionary/emergency use of airbridges from an aerodrome-licensing viewpoint, but the airport is in the best position to develop general policies about activities on the apron and, if necessary, prescriptive controls. The responsibility of the handling agents then is to adapt their procedures and to train staff so that the airport policy can be met. By this circular auditing system, we check airports and they check handling agents."

Because airport operators develop emergency plans for many types of contingencies, they can coordinate procedures for the precautionary/emergency use of airbridges.

"Airports are required to exercise emergency procedures and conduct planning at all levels at regular intervals," Walker said. "I am not aware of any recent exercise that looked specifically at an apron/stand incident."

In most situations, reattaching an airbridge after retraction probably is not appropriate in any time-critical scenario, Walker said.

"From my observation of aircraft turnarounds, it is debatable whether reattaching an airbridge would be the wise thing to do in an emergency," he said. "The length of time elapsed between the airbridge coming off the aircraft and the aircraft moving typically is so quick that it would be quite difficult to get a tractor [tug] driver to stop, reverse direction and put the aircraft back in the correct position for the airbridge operator. Also, it is not routine for an airbridge cab to be staffed once the aircraft has moved off the stand. From my experience of watching handling agents and dispatchers, as soon as the airbridge is uncoupled and retracted, they move on to the next task."

Apron areas where evacuation slides might be deployed must be kept clear whenever passengers are aboard a parked airplane, and the entire apron area around an airplane must be clear of obstacles by the time of pushback, he said.

"Up to pushback, I would expect that rapid disembarkation via the airbridge would be used, if possible, in some emergencies," Walker said. "The airport operator should have a policy on this according to the risk and hazards. The greatest hazard probably would be a running-fuel fire following a refueling mishap on an adjacent stand. It is almost inconceivable that evacuation through the airbridge would be the best choice for that because it probably would be difficult and time-consuming to get an airbridge reconnected."

Extensive procedures typically are in place for triage (determining priority for medical treatment) of injured passengers when they are evacuated via slides onto the apron, but equivalent procedures may not exist when passengers use an airbridge, he said.

Andrew Badham, senior operations manager, British Airports Authority (BAA) Group Airside Operations, said that although possible threats to safety are real, very rarely have safety incidents occurred at airport gates in the United Kingdom while an airbridge was docked to the aircraft.[24]

"An example of the type of incident that could occur during boarding and require an evacuation is a serious fuel spillage beneath the aircraft," Badham said. "If this type of incident were to occur, there would have to be a very good working relationship between the airline's crew, the ground-handling agent who operates the airbridge, the fueling company and the airport's ARFF service."

Effective working relationships and appropriate procedures help to prevent ineffective responses.

"Lack of clarity about roles and responsibilities could occur during the embarkation when not all the passengers are on the aircraft, and there is a sudden requirement to evacuate the aircraft," he said. "Questions to address in policies and procedures include: Who then is responsible for the passengers on the aircraft? Answer: The cabin crew. Who is responsible for the passengers still in the airbridge tunnel? Answer: The handling agent. This is why joint training is important — so that all parties know exactly what their responsibility is and to whom."

Badham said that the handling-agent's staff typically is responsible for passenger safety in the passenger-boarding area of the terminal building and for operating the airbridge, and cabin crews are responsible for passenger safety within the aircraft.

During an emergency, these roles are the same, but procedures typically add rapid backup of these personnel by the airport ARFF service and by airport-terminal security staff, he said.

"Normal communication will be by radio from the flight crew to ATC, by intercom to the pushback crew and by intercom to the cabin crew," Badham said. "If the flight crew needs to communicate with the airbridge operator, it probably would be through the radio to the handling agent with direct voice communication and hand signals as backup modes."

The U.K. CAA recommends that adequate safety/security procedures be provided for handling passengers and their property after an evacuation or precautionary deplanement.[25]

"During rapid deplanement, passengers will be instructed to leave their belongings and — depending on the nature of the incident — they either will be reconciled with their property later, or the flight eventually will depart as normal," Badham said. "If an emergency occurs during pushback, the captain might elect to go back on the airbridge; therefore, it is important that the handling-agent staff member remain in the airbridge cab until he or she is sure that the aircraft has safely pushed back, has been uncoupled from the tug on the taxiway and will not return to the [airplane-parking] stand. There should be no difference — except speeding up the docking procedures — between normal docking and emergency docking of an airbridge."

Airport emergency plans should be tested frequently, with a number of brief tabletop exercises and staff briefings throughout the year. The plans also should consider how the airbridge will be used during a fire, he said.

"Airbridges designed and built to current BAA fire-rating standards [using U.S. National Fire Protection Association Standard NFPA 415, *Standard on Airport Terminal Buildings, Fueling Ramp Drainage and Loading Walkways,* 1997] will withstand a temperature of 990 degrees Celsius [1,814 degrees Fahrenheit] for 10 minutes during a fire on the outside, and will allow safe evacuation, assuming that the bridge is connected correctly and that the folding canopy is covering the airplane entrance," Badham said. "BAA airports require that the canopy be operated at all times during airbridge use as there is an interconnection between the canopy deployment and the auto-leveling device that keeps the bridge at the same level as the aircraft door. An airbridge that is not positioned and docked correctly could present a hazard by not having the correct fire seal."

Because interior areas of airbridges could be exposed to smoke or fire under some conditions, training of operators and other airport personnel should include information about the proper action to take, he said.

"Emergency-exit blockage also will be part of the ground-handling training for baggage handlers, caterers, etc.," Badham said.

All U.K. operators of airbridges are licensed by their respective airport to use the equipment in normal situations and emergency situations, he said.

"Normally, at the large airports, the airport company provides and maintains the airbridges; the handling agents or airlines then have experienced trainers who carry out the training to an agreed airportwide standard," Badham said. "During normal ground-handling training, the areas into which slides might deploy will be pointed out to all staff, and those who have dealings with doors, etc., will be instructed in correct opening procedures to avoid inadvertent slide deployment. Should the slides deploy in a real emergency, all ground-handling crew will be expected to assist in moving passengers away from the aircraft to a safe area; these staff will then be assisted by airside operations staff and ARFF."

Badham said that scenarios in which rapid deplanement escalates into an evacuation typically are discussed in training, because they are more difficult, but are not practiced in emergency exercises.

In the event of an unplanned deplanement, airbridges at BAA airports are designed to provide a fire-protected route and smoke-free passageway to enable safe evacuation. They include an emergency override (such as a button or a push bar) so that during an unplanned deplanement, passengers and crewmembers can enter the terminal building through a door that is locked [from the outside] or not staffed, Badham said.

"The security requirements are very strict regarding passenger movements, but local authorities typically will require the terminal door to be attended by a member of the ground-handling staff," he said.

Telephones dedicated to emergency use are placed at the head of each airplane-parking stand at most major U.K. airports.

"All staff working airside are instructed in the use of emergency phones, emergency aircraft-stop equipment and, where applicable, emergency fuel cut-off buttons," he said. "We work on the principle that anyone can operate the emergency [telephones], and we would rather have several calls about the same incident than none."

Airbridges at BAA airports are inspected under a planned maintenance program and, to meet insurance requirements, they must be certificated periodically as serviceable, he said.

Peter Patrickson, general manager airfield services, Birmingham [England] International Airport, said that individual responsibilities at the gate must be clear because both captains and ground-handling agents take action during aircraft emergencies at the gate.[26]

"Emergency instructions and training affect their ability to handle precautionary deplaning at the gate under the airport emergency orders," Patrickson said. "Primarily, safety responsibility will rest with the aircraft commander. The handling agent, however, has the responsibility for a safe turnround from the point of the

aircraft entering the parking stand up to the point when the aircraft taxies for departure. We expect the handling agent to have a presence throughout the turnround process. The responsible handling-agent officer in charge of the turnround is the dispatcher, supported by passenger agents."

Airports in the United Kingdom typically train and license operators of airbridges, with a program for renewal of the operator licenses every three years, he said.

"These personnel have a personal duty of care in law to apply safety measures," Patrickson said. "Airbridge equipment also must be fully serviceable at all times that it is in use or available for use. Unserviceabilities that affect safety require the closure of that facility until repaired. Barriers, doors and restraints are provided and interlocked to prevent falls."

In addition to these airbridge-safety methods, CAA has recommended that airport operators — which may have overall responsibility but not direct control — consider the following actions based on CAA analysis of relevant incidents at the gate:[27,28]

- Prepare rapid-deplaning checklist procedures and procedures specifically designed for aircraft evacuation at the gate;
- Verify that the emergency procedures of all affected organizations ensure the availability of equipment that will facilitate rapid deplaning via airbridge;
- Prepare procedures and training for rapid deplanement or evacuation of occupants from out-of-service aircraft;
- Verify that aircraft crews are trained on the selection and conduct of appropriate rapid-deplanement measures or evacuation measures at the gate, including how to determine the availability of an airbridge or stairs before deciding which method to use, and how to communicate their intentions to ground personnel; and,
- Encourage airlines and aircraft crews to adopt a policy requiring normal evacuation in any situation in which rapid-deplanement procedures via airbridge are not clear.

Airport operators, airlines, ARFF services and ground-handling agents periodically should review their safety-management arrangements based on actual experience to update operations manuals, operating procedures and training, CAA said.

The consensus of these specialists was that many airports, air carriers and ground-handling agents have the opportunity to implement or improve communication, coordination and operating procedures for rapid deplaning of passengers via airbridges. They said that these procedures do not substitute for the capability to conduct an emergency evacuation at the gate with all usable exits and slides, however.♦

Notes

1. The U.K. Civil Aviation Authority (CAA) — in Civil Aviation Publication (CAP) 642 *Airside Safety Management* — recommends that airbridges be used, whenever possible, to separate passengers from apron hazards such as moving vehicles. CAA said, "Overall responsibility for ensuring that passengers are safeguarded between the aircraft and the terminal building rests with the airline carrying them. … Airlines are responsible for appointing competent contractors [ground-handling agents]. ('Competency' includes having sufficient resources, including adequate numbers of staff, to deal with reasonably foreseeable eventualities.)" Mobile lounges and mobile stairs also are used for normal passenger boarding/deplaning.

2. U.S. National Transportation Safety Board (NTSB). *Safety Study: Emergency Evacuation of Commercial Airplanes.* NTSB/SS–00/01. June 27, 2000. NTSB said, in part, "Based on the [NTSB review of U.S. National Aeronautics and Space Administration Aviation Safety Reporting System (ASRS)] reports, the flight crews' responses to the questionnaire [about what situations would require an emergency evacuation according to company procedures], and a review of crew safety manuals, [NTSB] concludes that pilots are not receiving consistent guidance, particularly in flight operations and safety manuals, on when to evacuate an airplane." NTSB also recommended study of providing periodic hands-on airplane familiarization training for aircraft rescue and fire fighting personnel to enable them to assist quickly and efficiently during aircraft evacuations.

3. U.S. Federal Aviation Administration (FAA) Incident Data System. Report no. 19960309006259C. March 9, 1996.

4. FAA Incident Data System. Report no. 19940128003329C. Jan. 28. 1994.

5. NASA. ASRS Report no. 423920. December 1998. The ASRS is a confidential incident-reporting system. The ASRS Program Overview said, "Pilots, air traffic controllers, flight attendants, mechanics, ground personnel and others involved in aviation operations submit reports to the ASRS when they are involved in, or observe, an incident or situation in which aviation safety was compromised. … ASRS de-identifies reports before entering them into the incident database. All personal and organizational names are removed. Dates, times, and related information, which could be used to infer an identify, are either generalized or eliminated. ASRS acknowledges that its data have certain limitations. ASRS *Directline* (December 1998) said, "Reporters to ASRS may introduce biases that result from a greater tendency to report serious events than minor ones; from organizational and geographic

influences; and from many other factors. All of these potential influences reduce the confidence that can be attached to statistical findings based on ASRS data. However, the proportions of consistently reported incidents to ASRS, such as altitude deviations, have been remarkably stable over many years. Therefore, users of ASRS may presume that incident reports drawn from a time interval of several or more years will reflect patterns that are broadly representative of the total universe of aviation-safety incidents of that type."

6. NASA. ASRS Report no. 324043. December 1995.

7. NTSB Aviation Accident/Incident Database Report no. SEA00IA062. April 1, 2000.

8. Wyvern Air Safety Bulletin. Dec. 17, 2001.

9. FAA Incident Data System. Report no. 19960208010539C. Feb. 8, 1996.

10. FAA Incident Data System. Report no. 19980103002669C. Jan. 3, 1998.

11. FAA Incident Data System. Report no. 20001222029259C. Dec. 22, 2000.

12. NASA. ASRS Report no. 184748. July 1991. The report said, in part, "The captain told the first officer [that] they were going to evacuate out the front entrance and onto the jetbridge. The aircraft was still rolling and the captain was busy docking the aircraft to the jetbridge. The first officer then initiated the evacuation command over the public-address [system] without concurrence from the captain. The captain ordered him to stop [the command]. Confirmation was obtained from ground control that no smoke [or] fire were visible. The captain made a public-address announcement to stop the evacuation. By then, 80 percent of the passengers had ground-evacuated out of the aircraft using the slides. … While distracted by radio conversation [about flames and about whether fire trucks had been sent], the first officer [had] heard the captain say something to the effect of 'evacuate the passengers.'"

13. NTSB Aviation Accident/Incident Database Report no. DEN90IA189. Sept. 19, 1990.

14. NASA. ASRS Report no. 427614. February 1999.

15. CAA. CAP 642 *Airside Safety Management.* CAA said that, among other recommended practices, the airbridge operator should remain in the airbridge cab until passenger boarding has been completed, and the aircraft passenger door should remain closed until the airbridge has been docked (or retracted for departure), the canopy has been lowered and the autoleveler device has been set. Specific safety precautions also must be observed before pushback.

16. Airports Council International. *Apron Safety Handbook.* Second Edition. 1996.

17. Claussen, Nancy. Telephone interview by Rosenkrans, Wayne. Alexandria, Virginia, U.S. Feb. 5, 2002. Flight Safety Foundation, Alexandria, Virginia, U.S.

18. U.S. Federal Aviation Regulations (FARs) Part 121.570 "Airplane Evacuation Capability" says, "No person may cause an airplane carrying passengers to be moved on the surface, take off or land unless each automatically deployable emergency assisting means … is ready for evacuation. Each certificate holder shall ensure that, at all times passengers are on board prior to aircraft movement on the surface, at least one floor-level exit provides for the egress of passengers through normal or emergency means." Part 121.393 "Crewmember Requirements at Stops Where Passengers Remain on Board" says, "At stops where passengers remain on board, the certificate holder must meet the following requirements. On each airplane for which a flight attendant is not required by [Part] 121.391(a), the certificate holder must ensure that a person who is qualified in the emergency evacuation procedures for the airplane, as required in [Part] 121.417, and who is identified to the passengers, remains on board the airplane or nearby the airplane in a position to adequately monitor passenger safety; and the airplane engines are shut down; and at least one floor-level exit remains open to provide for the deplaning of passengers. On each airplane for which flight attendants are required by [Part] 121.391(a), but the number of flight attendants remaining on board is fewer than required by [Part] 121.391(a), the certificate holder must meet the following requirements. The certificate holder must ensure that the airplane engines are shut down; at least one floor-level exit remains open to provide for the deplaning of passengers; and the number of flight attendants on board is at least half the number required by [Part] 121.391(a), rounded down to the next lower number in case of fractions, but never fewer than one. The certificate holder may substitute for the required flight attendants other persons qualified in the emergency evacuation procedures for that aircraft as required in [Part] 121.417, if these persons are identified to the passengers. If only one flight attendant or other qualified person is on board during a stop, that flight attendant or other qualified person shall be located in accordance with the certificate holder's FAA-approved operating procedures. If more than one flight attendant or other qualified person is on board, the flight attendants or other qualified persons shall be spaced throughout the cabin to provide the most effective assistance for the evacuation in case of an emergency."

19. FARs allow, under specified conditions, the use or substitution during ground stops of qualified people other than flight attendants to monitor passenger safety — such

as pilots, gate agents or ground-handling personnel. They must have received evacuation-related training specified in Part 121.417, including individual instruction in the location, function and operation of emergency equipment including the following: evacuation equipment and operation of emergency exits in the normal mode and the emergency mode with the slide/raft pack attached (if applicable); training emphasis on the operation of the exits and the deployment of evacuation slides under adverse conditions; the evacuation of people who need assistance; and an emergency evacuation drill during initial training and recurrent training at intervals of 24 calendar months.

20. Farnaby, Chris. CAA. E-mail communication with Rosenkrans, Wayne, via Butcher, Nick. CAA. Alexandria, Virginia, U.S. Feb. 6, 2002. Flight Safety Foundation, Alexandria, Virginia, U.S.

21. CAA. CAP 642 *Airside Safety Management*. March 1995.

22. Walker, Gordon. E-mail communication with Rosenkrans, Wayne. Alexandria, Virginia, U.S. Feb. 14, 2002. Flight Safety Foundation, Alexandria, Virginia, U.S.

23. Walker, Gordon. Telephone interview by Rosenkrans, Wayne. Alexandria, Virginia, U.S. Feb. 18, 2002. Flight Safety Foundation, Alexandria, Virginia, U.S.

24. Badham, Andrew. E-mail communication with Rosenkrans, Wayne. Alexandria, Virginia, U.S. Jan. 31, 2002. Flight Safety Foundation, Alexandria, Virginia, U.S.

25. CAA. *Notice to Aerodrome Licence Holders 2/98*. "Allocation of Responsibility for the Safety of Passengers Embarking and Disembarking From Aircraft." April 1998. CAA. *Flight Operations Department Communication 11/98*. "Aircraft Safety on the Ramp." May 15, 1998.

26. Patrickson, Peter. E-mail communication with Rosenkrans, Wayne. Alexandria, Virginia, U.S. Feb. 22, 2002. Flight Safety Foundation, Alexandria, Virginia, U.S.

27. U.K. Civil Aviation Authority (CAA). *Notice to Aerodrome Licence Holders 2/98.*

28. U.K. CAA. Flight Operations Department Communication 11/98.

Further Reading From FSF Publications

FSF Editorial Staff. "Flight Attendant Training Helps Prevent Injuries in Aircraft Ramp-area Collisions." *Cabin Crew Safety* Volume 35 (May–June 2000).

FSF Editorial Staff. "Working in, Around Aircraft Cabins Requires Awareness of Fall Prevention." *Cabin Crew Safety* Volume 35 (January–February 2000).

Airport Operations

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