

Log 2410



# National Transportation Safety Board

Washington, D.C. 20594  
Safety Recommendation

Date: October 14, 1993

In reply refer to: A-93-125

Honorable David R. Hinson  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20591

On November 27, 1992, at 2039 central standard time, one passenger was seriously injured and seven passengers sustained minor injuries when a Delta Air Lines B-727-232 was partially evacuated while parked at a gate at O'Hare International Airport, Chicago, Illinois. The unwarranted passenger-initiated evacuation occurred during deplaning following an auxiliary power unit (APU) "torching."<sup>1</sup> According to statements by crewmembers and maintenance personnel, the engines had been shut down before the external electrical power source could be connected to the airplane, which caused the cabin lights to go out and the emergency lights in the cabin to illuminate. A flightcrew member then attempted to start the APU. A brief flash of fire, i.e., torching, emitted from the APU exhaust at the right wing root. A passenger described the event as a loud explosive sound with "huge flames shooting past the windows on the right-hand side of the plane." Passengers began screaming "fire" and opened overwing exits on the left and right sides of the airplane; thereafter, panicked passengers began evacuating through the overwing exits.

A flight attendant who was stationed at the boarding door in the forward cabin became aware of the evacuation when she noticed that passengers were no longer deplaning. She proceeded to row 10 and saw "commotion" at the open overwing exits. She instructed the passengers not to exit through the overwing exits, told them not to panic, and assured them that everything was okay. She then made her way to the overwing exits where she stopped passengers from deplaning and called passengers back into the cabin.

<sup>1</sup>"The APU provides both electrical power and bleed air for the air conditioning system and main engine starting. A torching start may result from excess fuel accumulation in the APU combustor assembly and exhaust duct. The torching start has a characteristic orange flash." Boeing's AIRLINER Magazine, April/June 1992.

A flight attendant who was stationed in the aft cabin heard passengers yell "fire" and saw smoke. She opened the aft pressure bulkhead door, exited via the airstairs, and directed passengers away from the airplane. When passengers ceased exiting, she reentered the cabin and was told by another flight attendant that there was no fire and that the pilots had made an announcement that the airplane was okay.

On September 9, 1991, about 2232 eastern daylight time, a Trans World Airlines (TWA) Boeing B-727-231 had an unwarranted passenger-initiated evacuation while taxiing at LaGuardia Airport, New York. During taxi, the flightcrew started the APU and was notified by a ground controller of a fire on the right side of the airplane. The APU was shut down and the airplane continued to taxi toward the gate. A passenger yelled "fire," and another passenger opened the left overwing exit and began an evacuation through the exit while the airplane was moving. Twenty to 30 passengers exited onto the left wing, and most of them slid or jumped off the wing while the airplane was still moving. The captain made a public address announcement that there was no need to evacuate; however, passengers may not have heard the announcement because the exit was open and the engines were running.

A flight attendant who was in the aft cabin witnessed passengers become hysterical after the passenger yelled "fire." A passenger opened the aft right floor-level exit despite the flight attendant's instructions to the contrary. The flight attendant activated the emergency evacuation alarm, which alerted the cockpit crew, and the airplane was stopped. Thereafter, the crew organized an orderly evacuation. Three passengers sustained minor injuries during the evacuation.

On May 31, 1987, at 2330 Pacific daylight time, a Mexicana Airlines B-727, with 145 passengers and a crew of eight, landed at Los Angeles International Airport. While waiting for permission to cross runway 25R, the APU was started, and passengers initiated an unwarranted evacuation when they saw fire on the right side of the airplane. At least two male passengers exited the airplane onto the left wing while the airplane was stationary between the two parallel runways. The airplane taxied across the runway, and according to one passenger, the two men were "hanging on to the left wing: one to the leading edge, one to the trailing edge," and "complete panic ensued." The pilot then stopped the airplane and ordered an evacuation during which two persons sustained serious injuries, and 10 persons sustained minor injuries.

The highest percentage of unwarranted passenger-initiated evacuations have occurred on B-727 airplanes. The Safety Board believes that these frequent occurrences are linked to the location of the B-727 APU exhaust outlet, which is clearly visible to passengers in the right overwing area.

According to the Federal Aviation Administration (FAA) and Boeing data, there have been 45 B-727 APU incidents between 1968 and 1991 involving fire. Passenger-initiated evacuations occurred in 11 of these (10 since 1983), and five passengers sustained serious injuries. Since these data were obtained, there have been at least two additional passenger-initiated evacuations (at LaGuardia in 1991 and O'Hare in 1992), one of which resulted in a serious injury. Thus, between 1983 and 1992, six passengers were seriously injured during 11 passenger-initiated evacuations that occurred because of APU torchings. The Safety Board is especially concerned about the potential for serious or fatal injuries when occupants evacuate from a moving airplane or when the engines are running.

On April 14, 1992, the FAA issued Flight Standards Bulletin FSAW 92-08, "Airworthiness on B-727 APU Tailpipe Torching Fires." The bulletin acknowledges that in the past several years, the number of passenger-initiated evacuations associated with B-727 APU torchings has increased. The bulletin recommends that Principal Maintenance Inspectors and Principal Operations Inspectors for operators of B-727 aircraft review airline procedures to ensure that maintenance programs include actions stipulated in B-727 Service Letter 727-SL-49-16, dated July 2, 1990; that training programs include the Boeing film "727 APU Torching-Flightcrew Briefing"; and that crews are made aware of important information and operating procedures recommendations contained in the article "727 APU Torching" in the Boeing Flight Operations Review, December 12, 1991. This article states, in part, that operators "should adhere to published maintenance schedules for the APU, ensure proper training of both flight deck and cabin crews, and cabin crews should be attentive to actions of passengers seated at overwing exits, to preclude passenger-initiated evacuations as a result of a torching APU start."

The Safety Board is concerned about whether cabin crew attentiveness to passengers seated at overwing exits can "preclude passenger-initiated evacuations." In several accidents, passengers opened exits before flight attendants knew that anything unusual had occurred. The ability of flight attendants to prevent passenger-initiated evacuations is affected by flight attendant locations in the cabin and by exit row seating rules.

FAA regulations require that flight attendants be seated in their jumpseats during surface movement. TWA's flight attendant Emergency Procedures Handbook states:

The 727 flight attendant seats are located where viewing of the right wing is very limited. Thus the flight attendants' information concerning APU torching is generally received from alarmed passengers saying there is a fire on the wing.

The Safety Board believes that problems with flight attendants being able to view the right overwing from their jumpseats are not uncommon. Flight attendant jumpseats are distant from overwing exits and often do not allow for adequate control of passenger actions. Exclamations, such as "fire," encourage panic and seem to prevent passengers from thinking rationally about the APU torching phenomenon. Several evacuations have occurred during deplaning, which further restricts flight attendants from viewing the overwing area because passengers have been out of their seats and retrieving items from the overhead compartments.


The Safety Board agrees with the FAA's Flight Standards Bulletin about the need for crewmembers to view the training video on APU torching. However, the Safety Board believes that the video does not adequately address the problem of passenger reaction and behavior. Safety Board investigations have uncovered problems that flightcrew and/or flight attendants encounter when they attempt to reassure passengers that APU torching does not merit evacuation; passengers apparently do not believe them.

On April 5, 1990, the FAA enacted a rule for Exit Row Seating, which required all Part 121 and 135 operators to screen passengers and "inform passengers sitting in exit rows about what may be required of them in an emergency evacuation." The Safety Board believes that passenger-initiated evacuations might be prevented by informing Boeing B-727 passengers that they might see an orange flash when an APU is started. The Safety Board believes that this information should be presented before the APU is started and, to prevent passengers from ignoring situations that may require immediate action, the announcement should direct passengers to immediately question flight attendants about unusual occurrences.

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

Issue an Air Carrier Operations Bulletin to require that Boeing B-727 cockpit crewmembers make a public address announcement about auxiliary power unit (APU) starts immediately prior to starting the APU. (Class II, Priority Action) (A-93-125)

Chairman VOGT, Vice Chairman COUGHLIN, and Members LAUBER, HART, and HAMMERSCHMIDT concurred in this recommendation.

  
By: Carl W. Vogt  
Chairman