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Passenger's Account of Escape from Burning Boeing 737 Highlights Cabin Safety Issues

Seconds after the Boeing 737 collided on landing with another aircraft holding for takeoff at Los Angeles International Airport, the cabin was filled with thick, black smoke. Despite heroic efforts by flight attendants, the evacuation was hampered by intense fire and delays in opening some exits.

by
David H. Koch

Editor's Note: On Feb. 1, 1991, USAir Flight 1493 collided with Skywest Flight 5569 on runway 24L at Los Angeles (California, U.S.) International Airport. The USAir Boeing 737 and the Skywest Fairchild Metroliner were destroyed and 34 people were killed. The following account by David H. Koch, a passenger on the USAir flight, dramatically underscores several cabin safety issues raised during the U.S. National Transportation Safety Board's (NTSB) investigation of the accident. In addition to safety factors that caused the accident, the NTSB noted cabin safety issues including "accident surviv-

ability, evacuation standards and procedures, interior furnishing flammability standards and survival devices."

On Feb. 1, 1991, at the conclusion of Friday business meetings, I went to the airport in Columbus, Ohio, to fly to California. I wanted to be in California to attend a meeting in Santa Monica the next afternoon.

There was a nonstop USAir flight that left at 4:15 p.m. (local time) from Columbus and was scheduled to land at Los Angeles at 6:11 p.m. (local time). I made

the flight with time to spare and settled back for a pleasant trip.

The airplane, a Boeing 737, was about two-thirds full with 83 passengers and a crew of six on board (Figure 1). The en route flight was uneventful and quite smooth.

In the first-class section, there were two rows with four seats each. All were empty except for the two seats across the aisle from me, which were occupied by a pleasant older

couple. During the flight, I read and relaxed with my shoes off and my suit jacket in the empty seat next to me. This was my situation as the flight approached Los Angeles.

I was sitting in seat 2A (next to the left window in the second row on the left side of the aircraft) rather than 2B. The weather was clear and everything appeared normal as we descended for landing. The setting sun illuminated the upper atmosphere, and because of the time of day, it appeared to be dark on the ground. We touched down on runway 24L. The touchdown was normal and I remember hearing the tires squeal as they contacted the runway. About five seconds later, there was a sudden, sickening crunch.

A shower of sparks flew up past my window and a ball of fire rolled by it. It instantly occurred to me that we had struck an airplane. Because the impact seemed so minor, I thought we had collided with a small, four-passenger airplane. Many of the passengers began to scream and make hysterical noises. A flight attendant immediately spoke on the intercom system and repeated "Stay down! Stay down! Stay down!"

After the initial impact, I unbuckled my seat belt and got in a position to run for the exit as soon as the plane came to a stop, which I thought would be any moment. But the aircraft did not slow down.

The collision of our B-737 with the Metroliner caused our plane to veer off the runway to the left. Later, tire marks on the ground showed that our plane moved diagonally across an active taxiway and then toward some airport maintenance buildings. We traveled approximately 15 to 20 seconds in this fashion, with sparks and flames alongside the left side of the plane. I do not recall seeing any flames through the right side windows.

During this period, the lights in the cabin stayed on and no smoke entered the cabin. The B-737 continued moving, dragging the smaller plane under the fuselage until the left side of the B-737's nose struck the corner of an abandoned fire station.

The impact of the B-737 against the building caused an enormous fireball to shoot upward past the windows on the left. I was thrown against the seat in front of me and then into the bulkhead, several feet

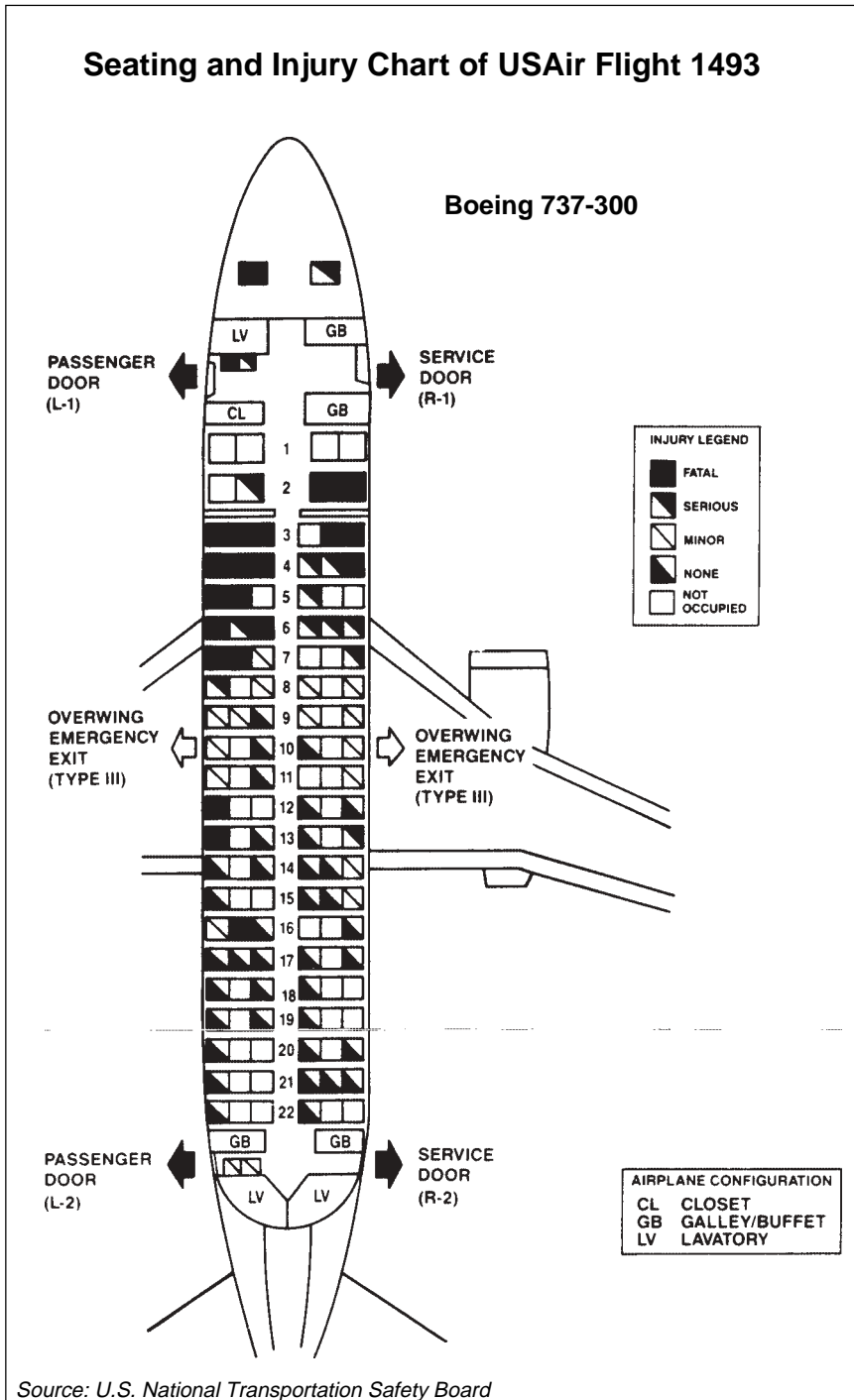


Figure 1

farther away. I suffered a number of bruises on my chest and forearms where I had struck the back of the seat.

The cabin lights immediately went out, and people began to scream hysterically and rush down the aisle towards the rear of the plane. The emergency lights failed to operate, at least in my section of the plane. A few seconds later, the interior of the plane began to fill with intense, heavy, black smoke that was extraordinarily painful to breathe.

The intercom system went out and the flight attendant stopped giving instructions. I immediately got on my hands and knees and attempted to find my shoes, which had been under the seat in front of me. I believed it would be difficult to escape a burning plane in my stocking feet.

Unfortunately, I could not find my shoes. Next, I reached for my suit jacket that had been on the seat to my right, but could not find it either. My thought was to use it as a face mask to protect my lungs from the smoke.

I stayed on my hands and knees and attempted to crawl down the aisle towards the rear of the plane. Several people stampeded over me and moved past me without saying anything. The cabin became dark from the heavy smoke. Although the bright light from the fire on the left side illuminated the interior of the plane, I could make out only vague outlines of people in front of me. After moving a few rows down the aisle, I encountered a fighting, frenzied mob jamming the aisle.

The congestion of people in the aisle suddenly made me realize that escape was probably impossible because I was last in line to get out the rear exit. I concluded that I was probably going to die. At that point I stood up and, choking heavily on the smoke, walked back towards the first-class section.

My thoughts at that moment were clear and calm. I was not panicked nor was I terrified. There was a sense of disbelief that I was in this position fighting for my life when just a few moments earlier I had been happily reading and looking forward to a lovely evening. It was almost as if I was out of my own body looking back at myself as another person going through this experience. I thought to myself, "I have had a lot of interesting experiences in my life, and I am about to have an unusual one — the experience of death." I had a sense of curiosity of what death was going to be like for me. For a few long moments I stood there, immobilized, and prepared myself to die, not knowing what else to do.

Suddenly, I realized that the heavy smoke must have come from an opening in the fuselage. I believed that there might be a crack in the forward fuselage that might be large enough for me to squeeze through to escape from the airplane. I walked forward in calm desperation to the front of the plane behind the cockpit. I looked to my left at the door through which passengers entered the plane and saw an inferno of fire through the door window. Escape through that door was impossible.

I was totally alone. The doorway to the cockpit was closed. I sensed heavy smoke coming from the cracks around the door, and guessed that the cockpit was in flames. I turned to the right and felt my way to the service door in the galley. To my astonishment, I detected an opening several inches wide between that door and its frame on the right side. I could see some light on the other side. By this time, I was feeling very faint and I later guessed I had only 15 seconds to 30 seconds of consciousness left. Every breath caused me to convulse and was extremely painful. I put my fingers in the opening and pulled. The door moved somewhat, which enabled me to put my head out and take a deep breath of fresh air. A tremendous feeling of strength came over me, and I felt revived. With this added energy, I pulled the door some more and it moved a couple of feet. This permitted me to step into the doorway and see the ground below.

I could see flames coming from underneath the plane and smoke rising past the door. A tremendous sense of exhilaration came over me when I realized that I was not necessarily going to die and I had a chance to live.

Realizing that I was in my stocking feet, I hesitated a moment as I looked down. Finally I said to myself, "Oh, what the hell!" and jumped past the flames onto the asphalt tarmac. I landed on the ground and rolled forward, badly skinning my knees and bruising my right heel.

Once on the ground, I crawled and stumbled away from the plane and then ran about 30 yards (27 meters) before stopping. My lungs hurt terribly, and I coughed and choked for about five minutes before I could breathe comfortably again. When I was able, I turned back to look at the airplane.

The sight was a nightmare. Tremendous flames were rising from the far side of the plane and moving down the length of it. The nose of the plane appeared to be on fire as well. People were struggling to get out the safety door on the right wing. The right rear exit safety chute was in place, and people were sliding down the chute, getting up and running away from the airplane.

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Smoke was pouring out the open exits of the plane. There appeared to be about 40 or 50 passengers who had escaped and they were standing near me on the ground. I did not see anyone else come out the galley service door.

It was a puzzle to me why the galley door was unlocked, but not fully opened. I was also puzzled why the safety chute did not release. The flight attendant who was sitting on the jump seat at the front of the plane told me later that he had opened the door and that he and another person had escaped through it. The flight attendant was in a daze with a big, bloody gash on the right side of his neck. He did not seem too coherent.

[According to the NTSB accident report, the R-1 (forward, right-hand service) exit flight attendant testified that he had opened the door fully and that two passengers exited through the door before he was forced to exit by intense fire and smoke. Koch, in a recent interview, said that he was alone at the time of his escape and that he had to force the exit door open. The NTSB report said the R-1 slide pack did not deploy and was found below the door in an area where the floor was burned away. The bolts of the pack's retaining brackets were found sheared off.

The NTSB report said that after the aircraft struck the abandoned fire station, the flight attendant "recalled that the smoke coming through the floor near him became more dense and that it became more difficult to breath. He noted that the first-class cabin filled with smoke very quickly."]

Shortly after I jumped from the plane, the fire trucks arrived. They went to work immediately, spraying white foam on the front and sides of the plane and onto the fire.

I felt better after I was able to breathe fresh air, and I attempted to engage other passengers in conversation. It was important to me to learn of their experiences in escaping from the plane.

Unfortunately, most people were very dazed and were walking around like zombies. They were disoriented and confused. They remained silent and stared at each other. A number of the passengers were shaking violently and sobbing. Several people covered from head to toe with white foam wandered to our group. A number of victims were badly injured and they were lying motionless on the tarmac.

Approximately 10 to 15 minutes passed before a couple of transit buses arrived to provide places for passengers

to sit. About one hour later, a number of personnel arrived with blankets to keep the shivering passengers warm. We waited on the bus next to the burning airplane for more than an hour.

Finally, we were taken in the buses to a passenger waiting lounge inside the airport terminal and we were kept there for another hour. It was almost as if we were prisoners. Because I was feeling fairly well, I wanted to leave immediately. I went to one exit and attempted to walk out, but the man at the door said that I could not leave, and that I would be arrested if I tried to leave. I decided not to force the issue.

Later my lungs were examined by a doctor who recommended that I go to the emergency room at a local hospital. Passengers who were not seriously injured provided their personal information to the officials and then, one by one, were finally released into the terminal. After giving my name and address to one of the officials in the room, I was taken downstairs to an ambulance. The ambulance transported me to a nearby hospital. By this time, my lungs were feeling very painful and I was hoarse. The emergency personnel gave me oxygen, which I breathed through my nose on the way to the hospital.

The flight attendant who was stationed at the rear of the plane was in the hospital bed next to mine while we waited to be examined in the emergency room. She told me that she opened the right rear door and deployed the emergency chute in the normal fashion. She said she helped a considerable number of people escape through this exit until the fire reached the chute and destroyed it. At that point, she said, she started to lose consciousness and decided to jump out the door. She suffered from smoke inhalation and was badly shaken.

I was examined by a lung specialist in the hospital, and he determined that there might be some lung damage. He advised that I should have a bronchoscopic examination which, if it showed extensive damage, would result in my being intubated. This involved running a plastic tube through one of my nostrils and then deep into my lungs to deliver pure oxygen.

Before the bronchoscope was inserted, I was made semi-conscious. The pain was indescribable; I remember writhing in agony while it was being done. Several hours later, I awoke gagging and unable to speak. The tube passed across my vocal cords, making speaking impossible and swallowing very difficult. In addition, the pressure the

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tube exerted on the tender and damaged membranes inside my nose and throat caused intense pain, making any movement of my head extremely uncomfortable. It was necessary to give me morphine injections every one or two hours during the next two days to permit me to tolerate the pain. Because I could not swallow, I was fed intravenously during this period.

The doctor advised me before I went through the intubation procedure that smoke inhalation could take between 12 and 40 hours to fully develop all its harmful effects. My lungs responded to smoke damage by swelling and filling with fluid. If the injury was serious enough, I could have drowned in my own lungs' fluids. An additional danger was the possible contraction of pneumonia because bacteria enter the body very easily through the damaged membrane tissue in the lungs. The critical period for this to occur was during the first week after the injury.

I remained in the intensive care unit for two days. I was only able to communicate by writing notes. After the tube was removed, I was kept at the hospital another six hours for observation. My lungs performed adequately and I was allowed to leave the hospital on Sunday, two days after the crash. For several weeks after the tube was removed, I continued to cough up blood and mucus filled with black particles.

The day after the accident I became extremely distraught and suffered very bad psychological trauma from the shock. For a number of days afterward, describing the experience was very difficult, and I became quite emotional. In particular, discussing the people who had been killed near me was most upsetting. The flight attendant who had served me in first class was found dead in the aisle next to the window exit in the center of the plane, and the couple who had been seated across the aisle from me were also killed.

I have come to terms with the experience, and I can now describe it without serious emotional difficulties.

My lungs, bruises and scrapes have healed. The nightmares and flashbacks have stopped. I consider it a miracle that I escaped and that I came through the ordeal as well as I did.

[Koch said several safety features might have helped speed the evacuation. His suggestions included more emergency lighting, additional window exits and illumination of emergency door instructions. The U.S. Federal Aviation Administration (FAA) has since issued a Notice of Proposed Rulemaking designed to improve access to overwing emergency exits, which are

typically smaller than doorway exits. The changes apply to transport category airplanes with 60 or more passenger seats.

"The size of the Type III (overwing) exit is a limiting factor during an evacuation," the NTSB said. "In addition, some occupants lost valuable time because of a delay in opening the (right-overwing) exit, (an) altercation at the exit and a possible obstruction created by a broken outboard seatback."

According to the report, about 15 passengers "made their way to the rear of the cabin using the emergency floor path lighting. All of the passengers stated that the cabin filled with thick black smoke within seconds of the impact with the building."

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The intensity of the fire, which reduced the amount of time available for evacuation, was accelerated by the release of oxygen from the flight crew's oxygen system that was damaged in the collision, the report said.

The NTSB report also noted that two flight attendants unbuckled their seat belts before the aircraft came to a stop, and they were thrown forward when the 737 struck the building, "action that could have incapacitated them." The flight attendants were injured but helped evacuate the passengers from the aircraft.

"Although releasing their restraints was intended to speed up the evacuation, the possible consequences of serious injury could have prevented either or both of them from assisting the evacuation," the NTSB said.

The report also urged that a deadline be set for mandated fire safety standards for aircraft cabins. Cabin material flammability standards were set in 1988, with compliance to be achieved by the end of this decade. The only U.S. aircraft required to meet immediately the new standards are those manufactured after August 1990. Compliance has been slower than expected because aircraft that were in service before 1990 need only comply with the new standards if a "substantially complete replacement" of cabin interior components is undertaken.

U.S. Federal Aviation Regulations (FAR) Part 121 require that emergency lighting aboard aircraft "must illuminate each passenger exit marking and locating sign."

According to the FAR, the emergency lighting system must include "floor proximity emergency escape path marking" to help passengers find their way to exits.

In addition, the FAR require that "each passenger exit, its means of access and its means of opening ... be conspicuously marked. The identity and location of each passenger emergency exit must be recognizable from a distance equal to the width of the cabin."] ♦

References

U.S. National Transportation Safety Board. *Aircraft Accident Report: Runway Collision of USAir Flight 1493, Boeing 737, and Skywest Flight 5569, Fairchild Metroliner, Los Angeles International Airport, Los Angeles, California, February 1, 1991*. Report No. NTSB/AAR-91/08. October 1991.

Copies of the NTSB report may be obtained from the: National Technical Information Service
5285 Port Royal Road
Springfield, Virginia 22161 U.S.
(703) 487-4600

Suggested Reading

"U.S. Report: Progress Slow in Fireproofing Aircraft Cabins," *Cabin Crew Safety* Vol. 28 (March/April 1993).

"U.S. Study: Pathway Widths and Distances Are Key in Emergency Evacuation Times," *Cabin Crew Safety* Vol. 28 (January/February 1993).

"Report Says Emergency Training for U.S. Cabin Crew Sometimes Deficient," *Cabin Crew Safety* Vol. 27 (September/October 1992).

About the Author

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