

# **The Challenge of Emergency and Abnormal Situations for Flight Attendants**

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# Flight Attendant Role During Emergency/Abnormal Situation

- Prevent Accident/Incident
  - Communicate needed information to flight deck
  - Fight fires
- Reduce injuries and fatalities
  - Educate passengers about procedures and equipment
  - Implement emergency procedures



# Issues

- Communications
  - Cabin to Flight Deck
  - Flight Deck to Cabin
- Communication Equipment
  - Interphone/PA
  - Signaling Systems
- Procedures and Training



# M-1 Accident, Kegworth, UK

- Boeing B-737-400 January 8, 1989
- series of compressor stalls in the No 1 engine, which resulted in airframe shuddering, ingress of smoke and fumes to the flight deck and fluctuations of the No 1 engine parameters
  - No 2 engine was shut down



# M-1 Accident, Kegworth, UK (Continued)

- The captain made a PA announcement that he had shut down the right engine
- During descent to East Midlands there was an abrupt reduction in power to the No 1 engine and a fire warning occurred. Attempts to restart the No 2 engine were unsuccessful.







# M-1 Accident, Kegworth, UK (Continued)

- Passengers and 3 aft flight attendants saw evidence of fire from the left engine, however this information was never conveyed to the flight deck.
- AAIB analysis stated, “it must be stated that had some initiative been taken by one or more of the cabin crew who had seen the distress of the left engine, this accident could have been prevented.”



# M-1 Accident, Kegworth, UK (Continued)

- The AAIB issued a recommendation to improve flight deck cabin crew coordination in response to an emergency (Air Accidents Investigation Branch Aircraft Accident Report 4/90)





# B-747 Accident JFK, NY

## December 20, 1995

- 451 passengers, 12 F/As, 3 flight crew
- Rejected takeoff - airplane went off runway
- Nose gear damaged forward fuselage (A Zone)
- Flight Attendant observations:
  - heard “crunching, tearing” noises and saw the No 4 engine skidding down the runway before the airplane stopped. Smelled kerosene. Was hit by galley cart and sustained fractured shoulder



# B-747 Accident JFK, NY

## December 20, 1995 (Continued)

- When airplane stopped, the purser tried to call cockpit on interphone. No answer.
- The purser ran upstairs to cockpit to get instructions from captain. The purser stated that the captain did not inquire about cabin condition or injuries and purser did not report the upward displacement of floor in forward cabin.



# B-747 Accident JFK, NY

## December 20, 1995 (Continued)

- Captain announced that they would deplane via stairs
- Purser made PA announcement instructing passengers to remain seated. PA announcements were heard in the front of the cabin, but no one in Zones D,E, or aft of C heard the announcement.
- Aft F/As attempted to use interphone to communicate with Purser but were unsuccessful



# B-747 Accident JFK, NY

## December 20, 1995 (Continued)

- A deadheading flight attendant was sent forward to obtain information. He never came back
- There were no back-up procedures for establishing communication or assessing conditions in the event of failed PA and interphone.



# B-747 Accident JFK, NY

## December 20, 1995 (Continued)

- The Board believes that after an unusual occurrence such as a rejected takeoff (esp. on a wide-body airplane), positive communications are essential to coordinate the crew's response, even if the decision is not to evacuate.





# B-747 Accident JFK, NY

## December 20, 1995 (Continued)

- The Board asked the FAA to ensure that air carriers had adequate procedures for F/As communication including those for coordinating emergency commands to passengers, transmitting information to flight crew and other F/As and handling post-accident environments in which normal communications systems have been disrupted.



# MD-82 La Guardia

- MD-82 runway overrun following rejected takeoff, March 2, 1994, La Guardia
- The airplane continued beyond the takeoff end of runway 13 and came to rest on the main gear wheels with the nose pitched downward, so that the fuselage was balanced on top of a dike.



# MD-82 La Guardia

- Approx. 55 seconds after the airplane stopped, the Captain used the PA System to order an evacuation: “we see no fire be careful...go to the rear of the airplane...after you exit the aircraft.”
- An aft f/a heard the captain announce, “Exit aft” and she deployed the tailcone exit slide. The slide was unusable
- Some passengers thought that the captain instructed them to go to the rear of the airplane



# MD-82 La Guardia

- ARFF Incident Commander entered airplane and told flight deck that engines were still running.
- During the shutdown process the crew turned off the emergency lighting system which prevented the cabin emergency lights and floor proximity lights from illuminating when the engines were shut down.



# L-1011 In-flight Fire

- Canadian TSB investigated in-flight fire on L-1011, March 17, 1992, 170 miles from Goose Bay Labrador
- Fire in the aft left cabin; originated in “cheek area” which extends from main wheel well to aft pressure bulkhead
- 2 ft. flames entered cabin through return air vent





# L-1011 In-flight Fire

- Fire discovered by passenger and reported to flight attendant who immediately used halon into floor vent.
- Another flight attendant used water extinguisher on burning clothing lying on floor
- 3<sup>rd</sup> F/A called cockpit and remained on interphone to provide information to flight deck crew



# L-1011 In-flight Fire

- Beneath the cabin floor, the main generator cables from the No 2 engine and the cables from the aux power unit were severely burn-damaged
- Probable cause was electrical arcing or short circuiting in an electrical wire bundle under the cabin floor. Lint.



## MD-88 In-flight Fire

- September 17, 1999; Emergency Landing at Covington
- F/As detected a “lit match” smell and reported it to flight crew. Smoke in forward cabin
- F/As reseated a passenger in row 11 because he said his feet were hot. His carry-on bag was scorched, as was the right sidewall above the floor vent. F/As saw an orange or red flickering glow beneath the vent at that location.



## MD-88 In-flight Fire

- F/A No. 1 went to cockpit to tell them about her observations and asked the capt whether to use Halon in the vent. She was told not to use halon.
- While she was in the cockpit, another F/A discharged the Halon into the vent and the glow was no longer visible.



## MD-88 In-flight Fire

- The source of the smoke in the cabin was a smoldering insulation blanket in the cargo compartment adjacent to a static port heater. Electrical arcing from the heater ignited the blanket and the smoldering became a self-sustaining fire that grew in size.
- Safety Recommendations A-01-83 through –87 were issued as a result of several in-flight fires





# MD-11 Evacuation

- Diverted to Charlotte, NC. March 31, 2002 because of fire warning light
- Seat 4-L “ She heard a faint noise that sounded like a smoke detector in the lavatory and then she realized it was the evacuation horn.”
- Seat 4-R – “The evacuation horn sounded and at first he thought it was a lavatory smoke alarm. He checked the lavatory and found no smoke and realized it was the evacuation horn sounding.”



# A-300 Explosive Decompression

- November 20, 2000, Airbus A300-605R returned and landed at Miami because of pressurization problem
- Call chimes and lavatory smoke alarms activated repeatedly
- F/A reports smelling smoke
- Cargo loop light illuminates
- Captain orders an emergency evacuation
- F/As had problems opening exits



# A300 Miami, Florida

- F/A No 2 stated, “between the lavatory alarms and interphone chimes it was difficult to determine if the evacuation alarm was activated.
- F/As were unable to open exits
- Purser eventually opened 1L and was ejected and killed



# Other Explosive Door Openings

- Tunis Air flight TAR631
- October 20, 2001
- 2L door exploded open during normal deplaning
- F/A who open door was ejected and seriously injured and F/A near door was ejected and killed



# Other Explosive Door Openings

- Airbus production facility, Toulouse, France
- June 13, 2002
- A330
- Production pressurization test
- Fatal injury to Mechanic who had preformed test many times before





# Safety Recommendations

## A-02-20 through -23

- § Pressure relief system for emergency exit doors on newly certificated aircraft
- § Warnings near emergency exit doors on currently certificated aircraft
- § Revise crew training manuals to include info on signs and danger of overpressurized aircraft
- § Require crew training manuals contain procedures to follow when aircraft is over- pressurized



# DC-9 Atlanta, GA

## June 8, 1995



- Engine fire, rejected takeoff, cabin fire, evacuation



# DASH-8, Seattle

## April 15, 1988

- Shortly after takeoff, F/A saw fire on right side of airplane. No announcement from flight crew - she called to tell them about the fire. They did not respond.
- She used PA to calm passengers and give “brace” instructions. When she thought they were close to landing, she instructed passengers to brace.
- In its accident report, the board acknowledged the value of the F/A’s instructions in preventing passenger injuries.



# Saab 340B

## New Roads, LA 2/1/94

- The F/A made a normal landing announcement and checked seatbelts.
- While in the rear of the cabin, she saw fire from the right engine. She went to the cockpit with the intention of telling them about the flames, but she did not tell them what she had seen



# Saab 340B

## New Roads, LA 2/1/94

- The F/O made an announcement to the cabin to prepare for an emergency landing, but it was actually made to approach control
- Neither F/A or passengers knew of impending emergency landing and were not prepared for accident.



# Saab 340B

## New Roads, LA 2/1/94

- The Board believed that the F/A had enough cues (lack of propeller movement, sounds of master warning chime and horn) to determine that an emergency landing was in progress and F/A should have prepared passengers for emergency landing
- Once airplane stopped, crew performed a timely and effective evacuation.



# NTSB Reports

- Special Investigation Report: Flight Attendant Training and Performance During Emergency Situations (NTSB/SIR-92/02)
- Emergency Evacuation of Commercial Airplanes (NTSB/SS-00/01)





# Interphone/PA Recommendations

- A-70-055
- A-71-044
- A-76-120
- A-79-064
- A-81-130
- A-81-131
- A-96-157
- A-97-057



# Evacuation Alarm Recommendations

- A-72-141
- A-81-129
- A-98-022
- A-00-090



# Cockpit/Cabin Crew Coordination Recommendations

- A-84-018
- A-84-043
- A-88-117
- A-88-126





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