



National Transportation Safety Board

Survival Factors Issues

Asiana Flight 214, B777
San Francisco, CA
July 6, 2013

Survival Factors Investigator



Overview

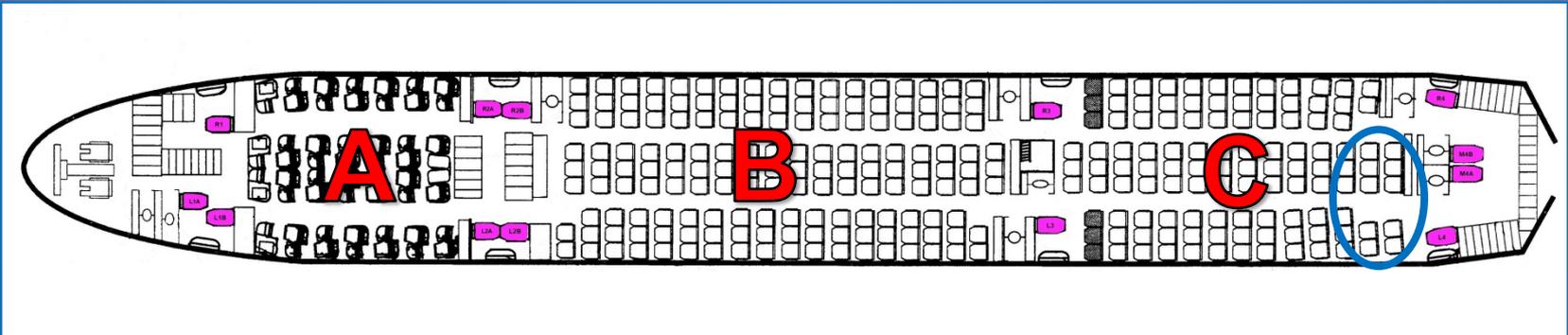
- Evacuation
- Injuries and fatalities
- Slide/raft performance
- Emergency response

Evacuation

- Cabin manager initially told not to evacuate
- Flight attendant L2A initiated evacuation after seeing fire outside door 2R
- Evacuation delay due to pilot's command, disorientation, and confusion

Fatalities and Injuries

- 3 passenger fatalities
- 49 serious injures
 - 1 flight crewmember, 8 flight attendants, 40 passengers



Fatalities and Injuries

- 6 occupants ejected from airplane
 - 4 aft flight attendants (seriously injured)
 - 2 passengers (41B and 41E)
 - Neither passenger was restrained for landing
- Passenger 42A not ejected
 - Likely struck by door 4L

Survivability Summary

- The airplane's structure and seats absorbed a tremendous amount of energy
 - 99% of occupants survived
 - 98% of passengers were able to self-evacuate
 - 83% of occupants sustained minor or no injuries

Slide/raft Performance

- 1R and 2R slide/rafts inflated inside the cabin, injuring and trapping 2 flight attendants
- Catastrophic damage discovered on some slide/raft release mechanisms
- Damage reproduced in testing
 - Failure loads were 2-4 times higher than FAA design certification limits

ARFF Staffing and Training

- SFO required to have 3 ARFF vehicles
 - FAA has no minimum ARFF staffing level
 - De facto minimum of 3 ARFF personnel
 - Staffed with 23 ARFF personnel
- Excess staffing at SFO allowed successful entry and interior attack
 - Extricated 5 trapped passengers
- New FAA interpretation of training requirements
 - All firefighters must be fully trained
- Significant change from FAA's historical interpretation and enforcement of its regulations

Use of High Reach Extendable Turret

- Two SFFFD HRET vehicles at SFO
 - Equipped with elevated booms and piercing tips



Use of High Reach Extendable Turret

- Could have been used more effectively
- Waited for “all clear” before piercing
 - SFFD lacked a policy on when to pierce airplane
- FAA advisory material does not contain guidance on when to pierce airplane

Incident Command

- City firefighting officers took command of scene upon arrival
 - No ARFF experience or training
- FAA does not require training for command officers similar to that for firefighters
- ARFF poses unique challenges and equipment has unique capabilities

Triage/Medical Response

- SFFD and mutual aid agencies triaged more than 300 occupants in a timely manner
 - All occupants transported within 90 minutes
 - 192 occupants transported to local hospitals
- Passenger 41E not appropriately triaged
 - Multiple personnel believed she was deceased but did not verify their visual assessments
 - Rolled over by two firefighting vehicles – 23 and 34 minutes after the accident

Communication

- Numerous problems with communications
 - Erroneous information about lack of fire
 - Lack of interoperable radios
 - Problems reaching command staff
- SFO exceeded FAA minimums for planning drills
 - Problems not identified and resolved
- SFO now has operational interagency frequency



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