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 injuries
  - 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 SFFD 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