Analysis of Problems Using Aircraft Evacuations Slides

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Study objective

Provide insight into the problems with evacuation slides
Evacuations involving slides
Study approach

• Literature survey

• Analysis of historical:
  – emergency evacuations
  – precautionary evacuations

in which slides were used.
Results

Literature survey
Results: Literature Survey

- No inflation of slide: 47%
- Problems due to wind: 13%
- Extreme attitude of the aircraft: 13%

TOP 3 of listed problems

NTSB/TSB studies
Results: Literature Survey

- UK CAA study (1995)
- Problems during test deployment:
  - Incorrect installation
  - Mis-rigging
  - Inflation device malfunction
  - Fabric torn
  - etc
Results

Analysis of historical evacuations
Occurrence data sources

- NLR Air Safety Database
- Incident reporting systems
  - UK
  - Canada
  - US
Results: Emergency Evacuations

• Time frame 1970-2003

• Western-built aircraft

• **151** emergency evacuations with slide usage

• **81** evacuations with one or more slide problems

54% of all occurrences
Results: Emergency Evacuations

Trend evacuations with slide problems

70-74: 47%
75-80: 60%
81-85: 75%
86-90: 55%
91-95: 47%
96-03: 48%
Results: Emergency Evacuations

Identified problems

- Slide not inflated: 28%
- Aircraft attitude: 16%
- Wind: 12%
- Slide burnt: 11%
- Incorrect rigging: 8%
- Slide ripped: 7%
- Other/Unknown: 18%
Slide inflation problems

• Different causes:
  – empty inflation bottles
  – incorrect assembly
  – inflation device malfunctions
  – etc
Aircraft attitude

Gear collapse

Ending in a ditch
Wind

- Wind varied between 6 - 28 knots
Slide ripped

High heel shoes!
Effect of improper functioning

Fatality rate is 1.7 times higher…
…when slides do not function as advertised
Results: Precautionary evacuations

- Overall time frame: 1987-2003
- 155 precautionary evacuations
- Data from Canadian, US, UK operators
Results: Precautionary evacuations

• Problems with slides in **6.5%** of all cases

• Problems:
  – No inflation
  – Ripped
  – Slide twisted
  – Slide fell off
Conclusions

• Problems with slides in more than half of all emergency evacuations

• Most problems related to installation and maintenance

• Identified problems are not new!
Recommendations

• Disseminate the findings

• Analyse SDRs on slide problems
Finally what is really important?

Your briefcase or your life?
Further reading

Analysis of Problems Using Aircraft Evacuations Slides
NLR report CR-2004-371

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