

# Cabin Safety and Fire Research - Past and Future

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- Accidents have been happening since the dawn of aviation



# Causes in early years

Design shortcomings

Pilot handling competence

Maintenance (or lack of)

# Later on

Mechanical Failures

Adverse weather

CFIT

Human Error

# Today

- Aircraft are well designed and maintained
- Pilots are competent and well trained
- Modern aids help to maintain situational awareness
- BUT the last 1000 feet is the time of most risk

# The last (or first) 1000 feet

Aircraft go up by grace of God

(or the laws of aerodynamics)

and come down with the connivance of  
Newton

( or the law of gravity)

***But below 1000 feet Newton has the  
upper hand***

BUT

Below 1000 feet the aircraft speed is often relatively low (<180 knots)

and

With modern aircraft designs many accidents are potentially survivable

Hence our research into cabin safety

# International Cabin Safety Research Technical Group

- Co-ordinates all cabin safety research by regulatory authorities
- Minimal bureaucracy
- Is used as a model for other inter-Authority research initiatives



# So what are the primary dangers

Impact injuries

Fire

# Past Research For impact protection

Crashworthiness

16g seats

# Past research - To mitigate the fire threat

- Fire resistant materials (cabin and fuselage)
- Fire detection/prevention techniques
- Better fire suppression methods

# Past research To speed up the evacuation

- Improved cabin design
- Better emergency exits
- Better evacuation management

# What next for impact protection?

- Three point harnesses
- Air bags
- Seat /floor attachments

# What next - fire protection?

- Halon replacements
- Inerting systems
- Burnthrough protection
- Less flammable insulation materials
  - (including hidden areas)
- Improved cabin interiors

# What next - evacuation?

- Management of emergencies in a very large aircraft
  - Two aisles (or more)
  - Twin decks (or more)
  - Communications between cabin crew
  - Design/use of very long slides
  - Use of internal stairs

# What next - evacuation?

- Use of computer modelling
  - For certification
  - As a training aid



# CONCLUSIONS

- Good international collaboration
- Significant success to date
- Regulatory Authorities are not complacent
- More can be done
- Need Industry buy in

Need to balance science, economics and emotion