



Project : Cabin Safety Culture

December / 2013

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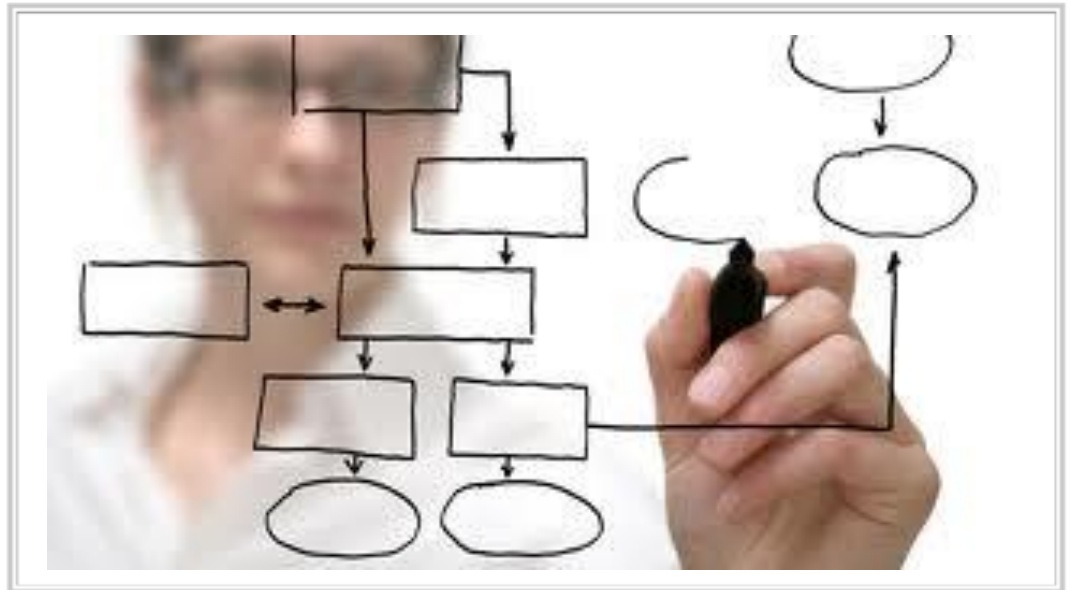
Objective

A prospection to identify opportunities to improve occupant safety and survivability



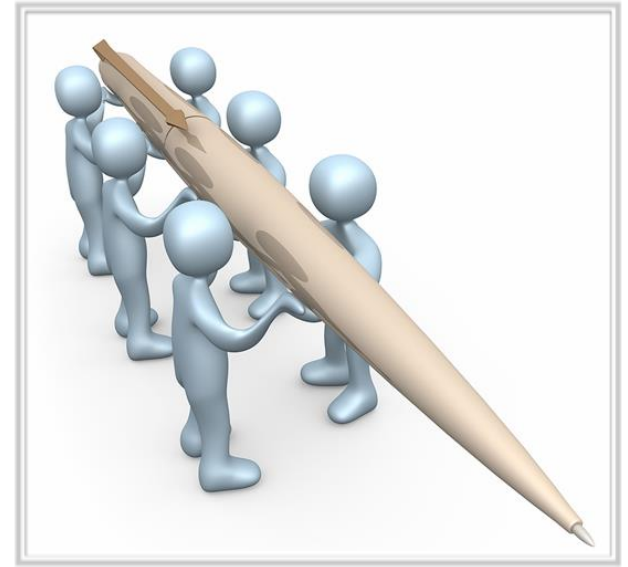
Methodology

- * Desk Research
- * Group Discussions
- * Interview
- * Industrial Experience



Research Team

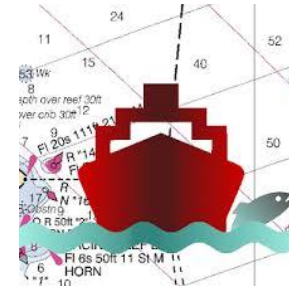
- * Product Development Engineer
(Commercial, Executive and Defense)
- * Airworthiness Engineer
- * Accident Investigator
- * Human Factors Engineer
- * Technology Development



Work Breakdown Structure



- * Survivable aeronautical accidents
- * Applicable emergent technologies and patents
- * Available safety standards, guidances and regulations for aeronautics
- * Standards from nautical, automotive and railways
- * Interview with regulatory authorities



Structure of the Research



Survivable Aeronautical Accidents

DATA SEARCH AND REVIEW

- ▶ Selection was based on accidents from 1998 and on, 650 accidents were searched from FAA WEB site, NTSB, TSB and CENIPA.

ANALYSIS AND ASSESSMENT

Methodology was developed using these steps:

- Select accidents with survivors (64)
- Read the reports and separate those which have the testimony of survivors.
- Analyze reports and detect the points that hindered the evacuation of the occupants of the aircraft.
- Analyze these points regarding design requirements.

RECOMMENDATIONS

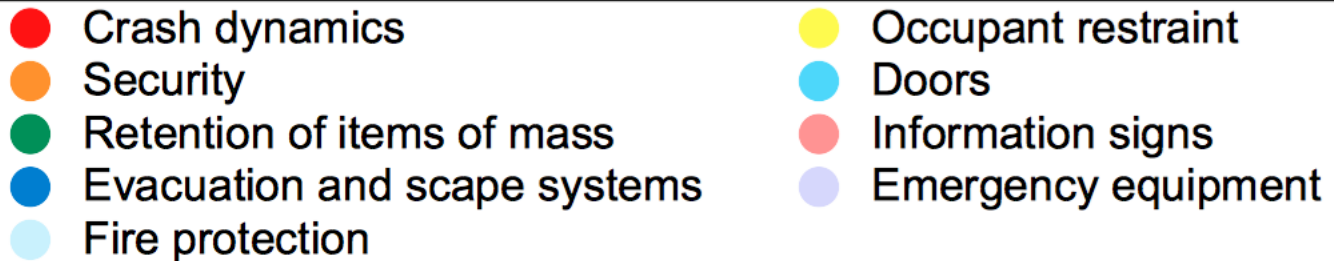
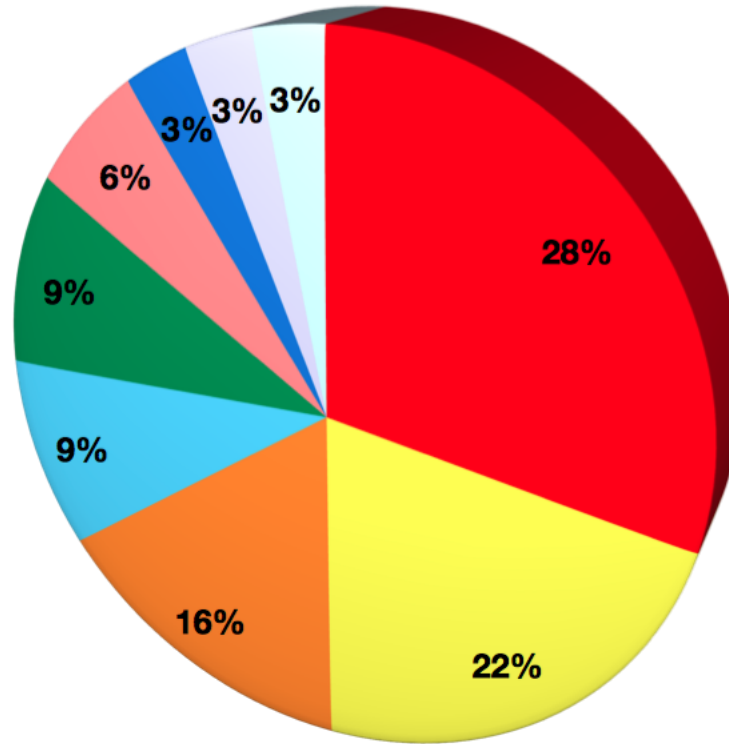
The following points have being identified as opportunity for improvements:

LOAD CELL	INTEGRATION	CREW SEATS	DOORS	OPERATIONAL LIFE FEEDBACK	SURVIVORS REPORTS
Install load cells at strategic points in the structure to have a better analysis after accident.	Improve the integration of interiors and systems considering the impacts on cabin safety.	Improve safety in the vicinity of the crew seat, the crew plays a very important role during the evacuation.	Improve access to, handling, identification, opening instructions and frame deformation of the doors.	Promote integration between project developers and aircraft operational life.	Importance of survivor's testimonies report in all accidents investigation.

Patents

DATA SEARCH
AND REVIEW

ANALYSIS AND
ASSESSMENT



Aeronautical Guidance & Standards Research

DATA SEARCH AND REVIEW



INTERNATIONAL CIVIL AVIATION ORGANIZATION
A United Nations Specialized Agency



RECOMMENDATIONS

The following points regarding regulatory standards have been identified as having major contributions on Cabin Safety

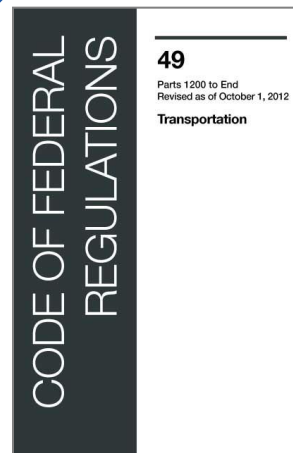
- ▶ *Occupant Impact Protection*
- ▶ *Improvement of Strength and Latching Systems of Overhead and Stowage Compartments*
- ▶ *Standardized Procedures for Emergency Water Landing*
- ▶ *Standardized Emergency Exit Doors Performance*

Others Means of Transport Standards (Nautical, Automotive & Railways)

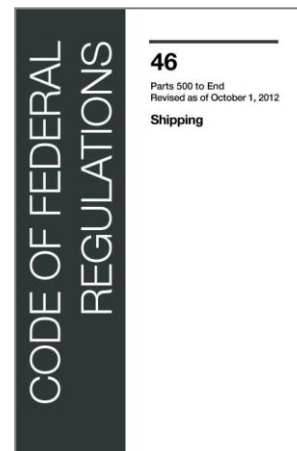
DATA SEARCH AND
REVIEW



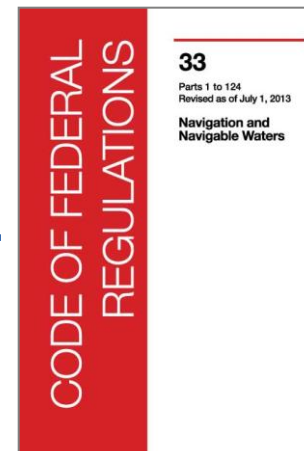
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ANALYSIS AND
ASSESSMENT

RECOMMENDATIONS

► Cabin safety ***issues were considered in the comparison:***

- Analyzed CFR 14 versus CFR 49 / 46 and 33.
- The delta was collected to be analyzed.

Points which could be considered on aircraft Cabin Safety aspects:

- ***Occupant restraint system***
- ***Emergency evacuation***
- ***Flammability***

Interview with Authorities

RECOMMENDATIONS



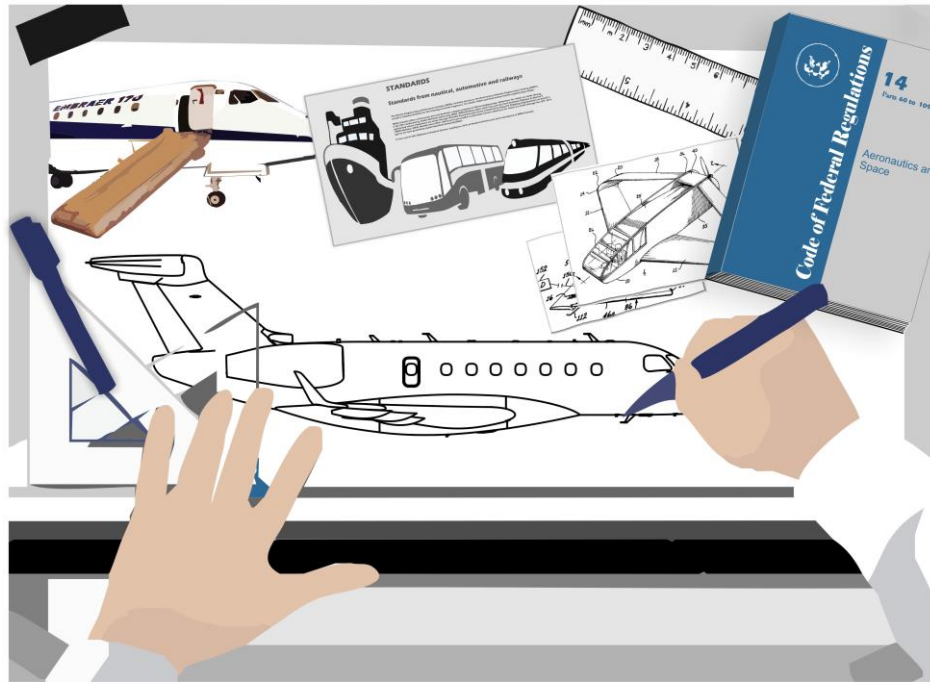
MEASURES TO IMPROVE CABIN SAFETY AND ITS CULTURE

- Systems Integration
- Institute a culture of design safety
- Impact protection
- Advances in aircraft materials
- Flammability of materials
- Evacuation



Conclusions

The integration of a different profile of professionals all involved with cabin safety and the possibilities established by each WBS pointed out that there are ways to increase our safety level beyond our current practices.



Flying safely and accident survivability is not a miracle...but "regulations based on solid research is what made it possible!" G. Morin

Research Team

- Alaide Bayma
- Flavia Renata
- Luciana Dias
- Luciana Ribeiro
- Diogo Voss
- Eduardo Iramina
- Jose Pistilli
- Nestor Dockhorn
- Cesar Alberto

