

***THE FOURTH  
AIRCRAFT FIRE AND CABIN SAFETY RESEARCH CONFERENCE  
Lisbon, Portugal  
November 15-18 2004***

***CALL FOR PAPERS***

**Background**

The Aircraft Fire and Cabin Safety Research Conference is held every three years by the Cabin Safety Research Technical Group (CSRTG). 2004 will be the first time the Conference has been held in Europe, previous events being held in Atlantic City USA. CSRTG members are drawn from major aviation regulatory authorities such as FAA, Transport Canada, JAA, IAC (Russia), CTA (Brazil), CASA (Australia) and JCAB (Japan). CSRTG co-ordinates research activities according to a prioritised plan to allow Authorities to influence research at an early stage, with the intention of producing studies that best meet international rule-making activities to maintain and improve aviation safety. Abstracts for Papers are now requested for review by the CSRTG organising committee. These should be no longer than one page and should be submitted by 1 March 2004 to:

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Presentations based on the Papers should have a duration of approximately 20 minutes. Presentation guidelines will be available in due course. General topic areas are as suggested below although other applications will be considered within the general constraints of fire and cabin safety research. The general focus is to be large public transport airplanes. Papers relating to helicopters, general aviation etc. will be accepted if a relevance to larger aircraft can be demonstrated. Background information and previous conference topic areas may be reviewed at [www.fire.tc.faa.gov](http://www.fire.tc.faa.gov)

**1 General Topics**

*Research progress and future directions*  
State-of-the-art and optimising research to improve post-crash survivability and other cabin safety aspects.

*Accident studies, databases, risk assessments and probabilistic methods*

Papers that provide guidance in research directions and priorities, making effective use of safety data or better methods of gathering safety data.

*Cost-benefit Analyses and Safety Economics*

Methodologies that can be employed either to assess the likely value of research prior to the commitment of significant resources or as an input to rulemaking.

*International Initiatives*

Results to date of international co-operative cabin safety research activities and summaries of international research initiatives in related areas such as passenger health .

*International Perspectives*

Organisational and national safety cultures. Passenger safety knowledge/education.

## **2 Crash Dynamics:**

*Structural strength and load attenuation*

Airframe Structures - Papers would address current and enhanced structural impact tolerance criteria that would be formulated to maintain the airframe protective shell and minimize airframe and occupant loads. Papers that illustrate the application and the verification of the effects of enhanced structural impact criteria are encouraged. Papers that present the results of structural impact tests that measure the impact environment and loads are likewise suited for this session. Papers that address composite material structures, fuel systems, or unique structural configurations (such as lower lobe seating) would be of interest.

Cabin Interior Components - Papers would address current and enhanced impact structural retention criteria applicable to cabin interior components such as seats, overhead luggage bins, galleys, and other significant items of mass. Papers that illustrate application and verification of the effects of enhanced impact criteria are encouraged. Papers that present the results of structural impact tests that measure the impact environment and component retention loads are likewise suited for this session.

*Computer modeling*

Airframe Structures Models - Papers would address the application and verification of crash dynamics computer modeling algorithms that predict the impact environment and loads imposed on the airframe structure. Papers that present and correlate the results of analyses and structural impact tests are encouraged for this session. Papers that address application to composite material structures and/or unique structural configurations would be of interest.

Seat/occupants Models - Papers would address the application and verification of crash dynamics computer modeling algorithms that predict the impact environment and loads imposed on airplane seats and their occupants. Papers that present and correlate the results of analyses and structural impact tests are encouraged for this session. Papers that address application to energy absorbing structures, composite material structures, and/or unique structural configurations would be of interest.

*Human injury criteria*

Papers would address enhanced occupant injury criteria for airplane occupants exposed to an impact environment. Of special interest would be papers that address enhanced occupant injury criteria for airplane side facing seats. Other topics of interest would include enhanced occupant injury criteria for the head, neck, pelvis, and lower extremities body regions. Papers that address the development and validation of anthropomorphic test devices and their relationship to occupant injury criteria are suited for this session. Airplane accident studies that place special emphasis on occupant injuries and the respective injury mechanisms would also be of interest. Papers describing improved restraint or protection systems would be welcomed.

**3 Materials fire Safety**

*Fuselage burnthrough resistance:*

Papers can address either test method development or the development of burnthrough resistant materials. Papers that address alternative methods of compliance are encouraged.

*Thermal/acoustic insulation:*

Papers can address either test method development or the development of compliant materials. Papers that address materials such as tapes and hook and loop are encouraged.

*Material Flammability:*

Papers should address materials used in the pressurized area of the fuselage. The organizers encourage papers concerning the materials in hidden areas such as ducting, and wire and cable.

*Fire testing methods:*

Papers are encouraged on the following test methods:

- Vertical Bunsen Burner Test for Cabin & Cargo Compartment Materials
- 45-Degree Bunsen Burner Test for Cargo Compartment Liners and Waste Stowage Compartment Material
- Horizontal Bunsen Burner Test for Cabin, Cargo Compartment, and Miscellaneous Materials
- 60-Degree Bunsen Burner Test for Electric Wire
- Heat Release Rate Test for Cabin Materials
- Smoke Test for Cabin Materials

Oil Burner Test for Seat Cushions  
Oil Burner Test for Cargo Liners  
Radiant Heat Testing of Evacuation Slider, Ramps, and Rafts  
Fire Containment Test of Waste Stowage Compartments  
Two Gallon per hour Oil Burner Certification Testing for Repaired Cargo  
Compartment Liners  
Recommended Procedure for the 4-Ply Horizontal Flammability Test for Aircraft  
Blankets

*Advanced fire resistant materials*

Papers would address synthesis, processing, modelling, characterization, testing, and fire behaviour of low heat release rate/fire resistant materials suitable for aircraft cabin interiors or secondary/primary structures.

#### **4 Systems fire safety**

*Halon replacements:*

Papers can address the development minimum performance standards and test methodologies for non halon aircraft fire suppression agents/systems in cargo compartments, engine nacelles, hand held extinguishers, and lavatory trash receptacles. Papers are also welcome on the development of new agents and/or systems for the above-mentioned applications.

*Fuel tank fire and explosion protection:*

Papers in this area can include research into how and when aircraft fuel tanks are flammable as well as methods to reduce or eliminate fuel tank explosions. An area of great interest to the conference organizers is that of nitrogen inerting of the fuel tanks.

*Fire detection and suppression:*

Papers in this area could include research in the area of advanced detection systems for cargo compartments as well as detection systems for use in hidden areas of the aircraft. Another area of interest would be suppression or extinguishing systems, such as water mist, for use in the cabin and/or hidden areas.

*Fires in nonpressurized areas:*

Papers in this area could include fires in engine nacelles, dry bays and systems and structure outside the pressure vessel.

#### **5 Evacuation**

*Computer models*

Application of computer models for evacuation studies and combustion effects are topics of interest, together with validation/accuracy/sensitivity assessments, use in certification, design and investigation would be welcomed particularly with application to very large transport aircraft.

#### *Human performance studies*

Experimental results from evacuation trials, human behaviour under stress, personality profile development, behaviour effects in darkness and smoke, enhanced recognition of smoke and fire, cabin spatial arrangements including Type III exits access/operation, bulkhead access and non-visual position cues e.g. acoustic would be welcomed.

#### *Experimentation and equipment*

Trials facilities and trials methodologies, data analysis methods including the use of video and participant tracking/eye tracking systems and integration of data from different sources/experiments would be of interest.

#### *Cabin crew and passenger issues*

Information management, communication and crowd management issues could be presented.

### **6 Operational Issues**

#### *Cabin crew training*

Assessments of safety training methods and studies looking at areas of potential safety benefits associated with security e.g. video surveillance would be welcomed. Cabin crew interaction with the flight deck would be of interest.

#### *Turbulence*

Detection systems developments and effective operational use of turbulence information papers are invited.

#### *Safety briefing*

Papers are invited on the use of improved safety briefing methods and provision of safety information (including dangerous goods) to passengers prior and post boarding.

#### *Safety equipment*

Research into improved safety equipment would be welcomed such as improved emergency lighting, portable thermal imaging cameras, improved slides.