

The 8th Triennial International Fire and Cabin Safety Research Conference
October 24 – 27, 2016
Atlantic City, NJ

“Safety Research – Teamwork in Action”

Monday, October 24, 2016

Opening Session

Location: Ballroom: Salon 3 & 4, 1:00 PM

| Topic | Presenter |
|---|---|
| Welcome and Conference Logistics | International Cabin Safety Research Technical Group |
| Introduction of Keynote Speaker | Shelley Yak Director, William J. Hughes Technical Center United States Federal Aviation Administration |
| Keynote Address | Victoria Wassmer Acting Deputy Administrator United States Federal Aviation Administration |
| International Cooperation on R&D | Jonathan Tan Senior Manager Airworthiness Engineering, Standards Civil Aviation Authority of Singapore (CAAS) Singapore |
| R&D and Certification | Jeff Gardlin Transport Airplane Directorate Transport Standards Staff – Airframe, Cabin Safety Branch United States Federal Aviation Administration |
| CAST & Relationship with Fire and Cabin Safety | James Wilborn Program Manager – Safety Enhancements Transport Airplane Directorate – Safety Management Branch United States Federal Aviation Administration |
| Materials and Systems Working Groups | Richard Hill Program Manager – Fire Safety Branch William J. Hughes Technical Center United States Federal Aviation Administration |
| Standards Organizations | Cynthia McLean Senior Human Factors Research Specialist (Retired) Office of Aerospace Medicine – Aerospace Medical Research Division United States Federal Aviation Administration |
| International Coordinating Council of Aerospace Industries Associations (ICCAIA) Cabin Safety Working Group (CSWG) | Robert P. Irons; The Boeing Company Jean-Francois Petit; Airbus SAS |

Victoria B. Wassmer

Acting Deputy Administrator

US Federal Aviation Administration



Victoria B. Wassmer was selected by FAA Administrator Michael Huerta to serve as the Acting Deputy Administrator of the Federal Aviation Administration in July 2016. In this role, she is responsible for helping to ensure the safe and efficient operation of the largest aerospace system in the world with over 50,000 operations daily as well as regulating the safety of equipment and operators of the U.S. aviation industry. Wassmer also serves as the Acting Chief NextGen Officer and is responsible for the development and implementation of FAA's NextGen modernization of the air traffic control system.

Previous to this position, Wassmer served as the FAA's Assistant Administrator for Finance and Management with oversight of the agency's \$16.9 billion budget and more than 3,000 employees. Wassmer managed the FAA's financial management, regional and Mike Monroney Aeronautical Center operations, information technology, contracting and acquisition offices.

In 2012, she spearheaded the agency's move toward "Shared Services," a revolutionary approach to reducing bureaucracy while improving service to the flying public. The shared services effort eliminated duplicate staffs and reduced the agency's administrative overhead expenses. Wassmer also instituted an effort by the agency to reduce and eliminate information technology costs, including the move to state-of-the-art cloud computing for the administrative systems used by 60,000 FAA employees and contractors.

Previously, Wassmer was Vice President of Administration and Finance at the Millennium Challenge Corporation, a federal agency that works with developing countries to reduce poverty through economic growth. At the Millennium Challenge, she oversaw finance, human resources, information technology, logistics, acquisition, grant management, overseas administration and security.

Before joining the Millennium Challenge, Wassmer served in several senior positions at the FAA from 2004-2010. She was Deputy Assistant Administrator and Chief Financial Officer, Deputy Director of the Office of Budget and manager of Performance and Cost Analysis.

In the years prior to her work at the FAA, Wassmer was a Senior Associate with the Carmen Group and also worked in the Office of Capital Programs & Oversight for the Washington Metropolitan Area Transit Authority. Her work there included creating legislative proposals for innovative financing solutions for the Surface Transportation Act reauthorization, capital project management, as well as program prioritization.

From 1996-2002, Wassmer was a policy analyst with the Office of Management and Budget. At OMB, she also served as Special Assistant in the Office of Information and Regulatory Affairs, and was a Program Examiner. In 1994, Wassmer worked in South Africa as a Research Assistant at the Development Bank of Southern Africa.

She holds a Masters in Public Policy from Harvard University and Bachelors in Political Science from Bryn Mawr College. She resides in the District of Columbia.

Jonathan Tan
Senior Manager
Airworthiness Engineering, Standards
Civil Aviation Authority of Singapore (CAAS)



Jonathan Tan is the Deputy Head for Airworthiness Engineering, Standards in the Airworthiness/Flight Operations Division. His responsibilities include ensuring that the regulations related to Airworthiness Engineering remains relevant and development of mutual recognition agreements. Jonathan also processes after the certification of cabin interior and structure modification for aircraft ranging from general aviation to transport category aircraft.

As a cabin interior specialist, Jonathan certificated the first flammability test facility in Singapore. Besides certification activities, Jonathan conducts safety oversight over a number of CAAS Design and Production Organizations.

Prior to joining CAAS, Jonathan was an engineer in ST Aerospace providing technical services support to the Republic of Singapore Air Force. His duties included; liaising with aircraft OEMs to troubleshoot in-service issues, developing repair schemes, and reviewing weight and balance limitations. Jonathan holds a degree in Mechanical and Production Engineering from Nanyang Technological University and a diploma in Mechatronics from Ngee Ann Polytechnic.

Jeff Gardlin
Transport Airplane Directorate
Transport Standards Staff – Airframe, Cabin Safety Branch
United States Federal Aviation Administration

Jeff Gardlin is a Senior Aerospace Engineer with the Standards Staff in the Federal Aviation Administration's Transport Airplane Directorate. His responsibilities include development of regulations and policies relating to all aspects of Transport Airplane occupant safety. He has worked in this capacity for 25 years. He has conducted training in aircraft certification requirements for other airworthiness authorities around the world. He has also been involved with the development of research programs relating to fire protection, evacuation testing, and crash dynamics. He is the principal author of rulemaking on incorporation of security measures into aircraft design, fuselage doors and aircraft fire protection.

Bob Irons
Interiors Safety and Airworthiness
Chief Engineer
Boeing Commercial Airplanes



Bob Irons began his career at the Boeing Company as a certification engineer supporting the FAA and JAA Type Certification of the 737 Next Generation and 757-300 models, and is now currently responsible for overseeing Certification and Safety activities for Interiors on Boeing production airplanes. Bob has also worked as an Evacuation Systems Airworthiness Representative for the Boeing ODA (Organization Designation Authorization) as well as an engineering manager on multiple airplane models.

Bob earned his Aeronautical Engineering degree from the University of Washington, and has a Master of Science degree in Technical Management from Embry-Riddle Aeronautical University.

Jean-Francois Petit
Certification Manager
Cabin & Cargo and R&T
Airbus SAS



Jean-Francois Petit is a Cabin and Cargo Safety Certification Manager at the Airbus' Airworthiness Technical Directorate. He was responsible for cabin safety and fire protection during the A380 Type Certification project. Prior to working at Airbus he was the head of the cabin fire safety department of the CEAT (Aeronautical Test Center of Toulouse). As an expert in cabin safety, Jean-Francois has also supported many cabin safety working groups.

Jean-Francois has an Engineering degree in Chemistry (ENSC Toulouse), and a Doctorate in Chemistry (Université Paul Sabatier Toulouse)

Tuesday, October 25, 2016

| | Salon 1 | Salon 2 | Salon 3 | Salon 4 |
|----------|--|---|--|--|
| | Cabin Safety I Chair: Cynthia McLean FAA (Retired) | | | General Fire Chair: Dave Blake FAA |
| 8:00 AM | Cabin Safety Research Introduction (Cynthia McLean) | | FAA Technical Center Fire Safety Research (Constantine Sarkos) | |
| 8:30 AM | The Evolution of Unique Interiors and their Effect on Cabin Safety (Michelle Albert) | | FAA Response to Halon Replacement ARC Recommendations (Steve Happenny) | |
| 9:00 AM | Evacuation Decision Making (Jason Fedok) | | Update on the Development of Halon Alternatives for Fire Suppression Systems (Maimuna Taal-Ndure) | |
| | BREAK | BREAK | BREAK | BREAK |
| 10:00 AM | Prepare for Impact: Familiarizing Passengers with Aircraft Emergencies through First-Person Simulation Games (Luca Chittaro) | | NTSB Cargo Fire Safety Recommendation (Joe Panagiotou) | |
| 10:30 AM | Crash Survivor Challenges Evacuating a Motorcoach with Postcrash Fire (Thomas Barth, PhD) | | Ethiopian Airlines 787 ELT Fire (Lisa Fitzsimons) | |
| 11:00 AM | Evaluating Aircraft Escape Path Markings in Immersive Virtual Reality (Stefano Burigat) | | Research Into Fire, Smoke, or Fumes Occurrences on Transport Airplanes (Ray Cherry) | |
| | Cabin Safety II: Occupant Protection Chair: Cynthia McLean FAA (Retired) | PowerPlant Fire I Chair: Douglas Ingerson FAA | Materials I: Oil Burners Chair: Tim Salter FAA | Battery I Chair: Tom Maloney FAA |
| 1:30 PM | Harmonization of Cabin Placards - Part 1 (Britta Henselmeyer & Markus Tiemann) | Hot Surface Ignition Temperature of Aircraft Fluids (Dr. N. Albert Moussa) | Sonic Burner Use in Cargo Liner and Seat Cushion Flammability Test (Tim Salter) | Battery Gas Analysis (Tom Maloney) |
| 2:00 PM | Harmonization of Cabin Placards - Part 2 (Britta Henselmeyer & Markus Tiemann) | Next Generation Fire Test Burner for Powerplant Fire Testing (Steven M. Summer) | Refinement of the Sonic Burner Used for Testing the Burnthrough Resistance of Thermal Acoustic Insulation (Robert Ochs, PhD) | Flammability Limits of Lithium Ion Battery Thermal Runaway Vent Gas in Air and the Inerting Effects of Halon 1301 (Matthew Karp) |
| 2:30 PM | Safety Briefings: Interactive and Non-Interactive Solutions (Luca Chittaro) | Updated Experimental Investigation of the NexGen Burner (Dr. Samir B. Tambe) | | Impact of Lithium Battery Vent Gas Ignition on Cargo Compartment Fire Protection (Tom Maloney) |
| | BREAK | BREAK | BREAK | BREAK |
| 3:30 PM | Child Restraint System Certification Policy Summary (Richard DeWeese) | Development of FAA Copper Tube Heat Flux Calorimeter for Parametric Study of Heat Flux Calibration (Dr. Mary Kelly) | Materials II: Composite Flammability Chair: Robert Ochs, PhD FAA | Status of EASA's Lithium Battery Projects (Enzo Canari) |
| | | | Development of a Vertical Flame Propagation Test for Composite Structural Materials, Air Ducting, and Wire Insulation (Robert Ochs, PhD) | |
| 4:00 PM | Child Restraint Performance in Oblique Seats (Aditya Belwadi/Amanda Taylor) | Intelligent Fire Protection System Technologies (Dr. Peter J. Disimile) | Intermediate Scale Flammability Testing of Composite Fuselage Structure (Robert Ochs, PhD) | Lithium Battery Cargo and Cabin Fire Safety (Captain Scott Schwartz) |
| 4:30 PM | | Minimum Performance Testing with a Blended Candidate for Aircraft Powerplant Halon Replacement (Douglas Ingerson) | Study of Temperature and Fire Exposure Effects on Carbon Reinforced Plastic Mechanical Behaviour (Eric Deletombe et al.) | Lithium Battery Hazard Detection, Mitigation, and Safety Certification in the US Navy (Daphne Fuentevilla) |

Wednesday, October 26, 2016

| | Salon 1 | Salon 2 | Salon 3 | Salon 4 |
|----------|---|--|--|---|
| | Cabin Safety III Chair: Cynthia McLean FAA (Retired) | Crash Dynamics I Chair: Jeff Gardlin FAA | Materials III: Heat Release Chair: Mike Burns FAA | Battery II Chair: Tom Maloney FAA |
| 8:00 AM | Educating Passengers about Life Preserver Donning (Luca Chittaro) | Structural Factors Influencing Survivability of Occupants in Airplane Accidents (Ray Chery) | Development of a Revised Test Apparatus for Measuring Heat Release Rate of Cabin Materials (Mike Burns) | Nonwoven Battery Separators Change the Safety Paradigm for Lithium Ion Batteries (Brian Morin, PhD) |
| 8:30 AM | Effectiveness of Locator Lights on Inflatable Life Preservers (Cynthia McLean) | Consensus Standards: Opportunities in Crashworthiness and Cabin Safety (Matt Kenner) | The Use of Fire Simulation as a Tool for Regulation Evolution: Application to Heat Release Rate (OSU) Requirements (Serge Le Neve, Camille Riera, Antoine Orth) | Prevent Lithium Ion Battery Thermal Runaway (Nicholas Johnson) |
| 9:00 AM | Aviation Distress Signals: Then and Now (Cynthia McLean) | Crashworthiness of Fuselage Hybrid Structure (Dieter Hachenberg, PhD) | Full-Scale Testing of Thermoplastic Paneling Used in Lower Portion of Aircraft Seats (Tim Marker) | Argon/Nitrogen - Lithium Metal Batteries (Steve Summer/Tom Maloney) |
| | BREAK | BREAK | BREAK | BREAK |
| 10:00 AM | PowerPlant Fire II Chair: Douglas Ingerson FAA | Crash Dynamics I Chair: Jeff Gardlin FAA | Materials IV: Regulatory Chair: Tim Marker FAA | Battery III Chair: Harry Webster FAA |
| | Reassessing Carbon Dioxide with Minimum Performance Testing for Aircraft Powerplant Halon Replacement (Douglas Ingerson) | Development of a Tension Energy Absorber - Progressive Bearing Failure Mechanisms of Composite Bolted Joints (Dr. Matthias Waimer) | ARAC Materials Flammability Working Group - Continuation of Task (Jim Davis) | Packaging Standard Considerations (Harry Webster) |
| 10:30 AM | | Summary of Results from Three Full Scale High Wing General Aviation Crash Tests (Justin Littell, PhD) | Approved Materials List Database Development (Scott Campbell) | Thermal Runaway Initiation Variation (Tom Maloney) |
| 11:00 AM | | Simulating the Impact Response of Three Full-Scale Crash Tests of Cessna 172 Aircraft (Dr. Karen E. Jackson) | Policy Statement on the Flammability Certification Testing of Interior Materials/Advisory Circular Industry Input (Michael Jensen) | Energetics of Lithium Ion Battery Failure (Richard Walters, PhD) |
| | Fire Research I - Fire Modeling Chair: Stanislav Stolarov University of Maryland | Crash Dynamics II Chair: Joseph Pelletiere, PhD FAA | Materials V: Flame Propagation Chair: Robert Ochs, PhD FAA | Battery IV Chair: Harry Webster FAA |
| 1:30 PM | High-Order Accurate Discontinuous Galerkin Simulation Tool for Fire Modeling (Mark Lohry) | Fuselage Section Crashworthiness Test, Analysis and Evaluation (Zhang Zhuguo) | Fire Testing of Nextel™ Ceramic Fabrics for Aerospace Applications (Sandeep Singh, PhD) | ICAO SAE G27 Packaging Standard Update (Doug Ferguson) |
| 2:00 PM | Development of a Complex Geometry Capability in the Fire Dynamics Simulator (Marcos Vanella) | Crashworthiness by Analysis: Verifying FEA Modeling Capabilities by Accident Reconstruction (Gerardo Olivares, PhD) | Intermediate Scale Flammability Testing of Wiring and Ducting Using a Vertical Fuselage Section (Robert Ochs, PhD) | SAE G27 Packaging Tests (Tom Maloney) |
| 2:30 PM | Modeling for Understanding and Preventing Cascading Thermal Runaway in Battery Packs (John Hewson) | Passenger Spinal Injuries in the 2013 Asiana and 2009 Turkish Airlines Crashes (Kristin Poland, PhD) | Interlaboratory Study of Radiant Panel Test for Measuring Flammability of Thermal Acoustic Insulation Materials (Steve Rehn) | Lithium Metal and Lithium-Ion Battery Packaging Development (Mark Petzinger) |
| | BREAK | BREAK | BREAK | BREAK |
| 3:30 PM | FireFOAM Modeling of Water Mist for Suppression of Compartment Fires (Ning Ren) | Evaluation of a Rigid Seat Test Methodology for Replacement of Seat Cushions on Transport Category Aircraft (Richard DeWeese) | Flammability of Thermoplastics: The Direct and Indirect Impact of Regulations, Policy Statements, and Other "Regulatory" Activity on Material Development (Ralph Buonicotti) | Thermal Packaging for Lithium Batteries and Devices: Emerging, Innovative Cost-Effective Solutions (Chris Egloff) |
| 4:00 PM | Numerical Study of Upward Flame Spread Over Discreet Fuels (Ya-Ting Liao) | Development of a New Method for Replacement of Multilayer Cushions for Dynamic Seats (Andrea Scialpi) | RTCA Development of a New Flammability Test for Electronic Black Boxes (Steve Rehn) | FAA Hazardous Materials Update (Michael Givens) |
| 4:30 PM | Prediction of Thermal Degradation of a Carbon Epoxy Composite by a Three-Dimensional Numerical Simulation (Pauline Tranchard) | Influence of the ATD Pelvis on the Lumbar Loads in a Horizontal-Vertical Test Scenario (Dirk Goetze) | Propagation of a Fire in Electrical Boxes (Thomas Krause) | |

Thursday, October 27, 2016

| | Salon 1 | Salon 2 | Salon 3 | Salon 4 |
|----------|---|--|---|---|
| | Fire Research II: Characterization & Testing Chair: Richard Walters, PhD FAA | Crash Dynamics III Chair: Richard DeWeese FAA CAMI | Cargo Fire I Chair: Dhaval Dadia FAA | Fuel Cells & Aircraft Installed Batteries Chair: Steve Summer FAA |
| 8:00 AM | Threat-Based Flammability Requirements for Military Vehicle Interiors (Jim Quintiere, PhD) | Comparison of the Hybrid II, AA Hybrid III, and Thor-NT in Vertical Impacts (Amanda Taylor) | SAE Standards Containers/ Covers (Dave Blake) | The Usage of Oxygen Depleted Air Generated by a Hydrogen Fuel Cell for Cargo Fire Suppression (Shane Nicholson) |
| 8:30 AM | Controlled Fuel/Oxygen Ratios in Microscale Calorimeter (Richard N. Walters, PhD) | Occupant Response in Oblique Aircraft Seat Environment (John Humm) | Part 25 Amendment 25-142 Revised Class B and New Class F Cargo Compartments (Steve Happenny) | Abusive Testing of Proton Exchange Membrane Hydrogen Fuel Cells (Steven Summer) |
| 9:00 AM | Toxicity Assessment of Polymers Using the Microscale Combustion Calorimeter (Louise Speitel) | Supplemental Injury Risk Considerations for Aircraft Side-Facing Seat Certification (David Moorcroft) | Class-E Cargo Compartment Fire Mitigation Strategies Subjected to Class-A Fires (Dhaval Dadia) | Flammability of Hydrogen at Sub-Atmospheric Pressures and Reduced Oxygen Concentrations (Steve Rehn) |
| | | BREAK | BREAK | BREAK |
| 10:00 AM | A Buoyancy Controlled Fire Calorimeter for Low Heat Release Rate Materials (Richard E. Lyon, PhD) | Finite Element Modeling of Lumbar Spine Biomechanics Under Oblique Loading Conditions (Jessica S. Coogan, PhD) | Class-E Cargo Compartment Fire Mitigation Strategies Subjected to Lithium Battery Fires (Dhaval Dadia) | Lithium Battery Systems for Aerospace Applications: Benefits, Issues, and Mitigation (Norm Perreira) |
| 10:30 AM | A Two-Step Mechanism for Combustion of Polymeric Solids Containing Flame Retardants (Haiqung Guo) | Comparison of Standard and Y-Belt Aircraft Passenger Restraints in Frontal Impacts with PMHS and ATD (John Humm) | Properties of Water Mist and Its Characterization (Karsten Kirbach) | Hazard Analysis for Various Lithium Battery Chemistries and Sizes (Steven Summer/Tom Maloney) |
| 11:00 AM | Pyrolysis Behavior of a BMS 8-276 Carbon Fiber Composite (Mark McKinnon) | Evaluation of Aerospace Seat Belt Webbing Material Under Dynamic Test Conditions (Joseph Pelletiere, PhD) | Kevlar® XF for Fire Resistant Air Cargo Containers (Ley Richardson) | Containment of Fire and Exposions from Failing Lithium Ion Batteries (Thierry Carriere, PhD) |
| | Fire Research III – Advanced Materials Chair: Rich Lyon, PhD FAA | Crash Dynamics IV Chair: Dr. Karen Jackson NASA | Cargo Fire II Chair: Dhaval Dadia FAA | Materials VI: Magnesium Chair: Bruce Gwynne Magnesium Elektron |
| 1:30 PM | Fire Research Materials Performance Web Access Database Overview (Carleen Houston) | Assessment of Head and Neck Injury Potential During Aircraft Longitudinal Impacts (Richard DeWeese) | A Review of ARFF Research Concerning Freighter Aircraft Fires (Jonathan Torres) | Development of Flammability Tests for Magnesium Alloys Used in Commercial Aircraft (Tim Marker) |
| 2:00 PM | Inherently FST Thermosets Solution for Aerospace Interior Composites (Kuanqiang Gao, PhD) | Comparison of Calculated ATD Head Kinematics from Accelerometer and Angular Rate Sensor Data to Photometric Analysis Data in Dynamic Aircraft Seat Testing (Robert Huculak, PhD) | Class C Compartment Work at FAATC (Dhaval Dadia) | Advances in Additive Manufacturing Using Magnesium Alloy Powders (Dr. Rajiv Tandon) |
| 2:30 PM | Using Deoxybenzoin Monomers to Generate Low Flammability Polymers for Aircraft (Todd Emrick, PhD) | Determining Loss of Consciousness in Fighters and Development of Associated Injury Assessment (Adam Bartsch, PhD) | Numerical Simulation for Fire Suppression Agent Propagation in an Aircraft Cargo Compartment (Dr. Konstantin Kallergis & Matthieu Hutchinson) | |
| | BREAK | BREAK | BREAK | BREAK |
| 3:30 PM | Controlled Atmosphere Pyrolysis Apparatus II (CAPA II) (Joshua D. Swann) | Development of a Lightweight Forged Magnesium Aircraft Seat Component (Dominic Henry) | Cargo Compartment Testing at UTAS FPS (Adam Chattaway) | Materials VII: Cabin Materials Chair: Tim Marker FAA |
| | | | | Impact of Altitude on Bunsen Burner Testing (Steve Rehn) |
| 4:00 PM | Polyphosphonate Flame Retardants in Aviation Applications (Lawino Kagumba) | Smarter Testing Through Dynamic Simulation (Shawn Li) | BTP Update (Al Carlo) | Revised Test Method for Evacuation Slides (Dung Do) |
| 4:30 PM | Challenges and Unexpected Benefits of Developing an Acoustic Barrier Film (Frederick Vance, PhD) | State of the Art Dynamic Seat Simulation (Luis Gomez) | | |