

SAE 2014 Aviation Technology Forum

Technical Session Schedule

As of 06/16/2014 07:41 pm

Tuesday, June 10

State of the Industry

Session Code: AES5

Room Ballroom C

Session Time: 9:00 a.m.

Leaders from global aircraft manufacturers will provide their insight into the industry, and their outlook on what the future holds for the Chinese Aerospace markets.

Organizers - James Sherman, SAE International

Time	Paper No.	Title
9:00 a.m.	ORAL ONLY	Keynote Speakers: State of the Industry
9:00 a.m.	ORAL ONLY	Welcome Address, COMAC Susan Ying, COMAC
9:05 a.m.	ORAL ONLY	Welcome Address, SAE International Gary S. Schkade, SAE International
9:10 a.m.	ORAL ONLY	2014 SAE International President - Introduction To SAE Richard W. Greaves, Meggitt PLC
9:35 a.m.	ORAL ONLY	Title TBD Susan Ying, COMAC
10:20 a.m.	ORAL ONLY	Global Air Traffic Growth & Challenges and Opportunities for China <i>Asia-Pacific region is leading global air traffic growth today. China is one of the fastest growing and largest aviation markets today and in 2032 and it will have soon the highest domestic traffic in the world. Increasing congestion and the need for sustainable development requires coordinated measures by all aviation stakeholders to be applied rapidly. An ideally suited set of effective and interoperable solutions will ensure that airlines can operate their fleet more cost efficiently within the given slot and airspace constraints, while serving all domestic and regional market demands; and passengers will enjoy shorter travelling time, while emissions will be significantly reduced.</i> Anton Walsdorf, Airbus
11:05 a.m.	ORAL ONLY	Bombardier Strategic Technology: Preparing the Future of Civil Aviation <i>Bombardier Aerospace is an innovative corporation, having launched 31 different aircraft since 1989. The company operates in the business, regional and single-aisle commercial markets. The aerospace industry has specific aspects that require careful and thorough development of new technology ahead of inclusion in new products: Long and expensive aircraft development cycles, Long Product Lifetime and Intensive Capital Needs. These aspects and an increasing awareness of aviation impacts on the environment will guide the industry approach to technology development in the coming years. The paper will present the prospects for progress in various areas of aircraft technology: airframe and configuration, systems and structures, illustrating them with specific Bombardier applications. It will then review technology insertions on the Global 7000, a new high-speed long range business jet and on the Cseries, the new single-aisle family of airliners, currently in certification flight testing. This airplane, produced in part in China, leads the contribution of Bombardier to the general effort of the world aerospace industry towards sustainability.</i> Antoine Mocellin, Bombardier Aerospace

11:50 a.m.

ORAL ONLY

Research and Development Towards Sustainable Aviation Industry Development

According to Boeing's Current Market Outlook 2013, China remains to be one of the most promising aviation markets, where 5,580 new airplanes will be delivered and the total fleet size is forecasted to triple over the next 20 years. To enable the huge market growth potentials and help Boeing operates healthy core business in this market, Boeing Research & Technology & China positions itself to be a valued partner, delivering knowledge and technologies for mutual benefits of Boeing and China, by addressing the key challenges for commercial and environmental sustainability of aviation industry. The outcomes from these activities contribute to preparing local infrastructure and support system for increased fleet, and reduced environmental impact by aviation industry. The presentation will describe how Boeing has chosen and invested research activities in

- (1) Sustainable aviation biofuels
 - (2) Recycling of carbon fiber reinforced composites
 - (3) Airspace operation efficiency
 - (4) Aircraft maintenance capabilities and efficiencies
 - (5) Future talent development in China for aviation & aerospace sector
- These activities will ultimately contribute to sustainable aviation development in this fastest growing and largest commercial aviation market in the world.

Dong Yang Wu, Boeing

Tuesday, June 10

Airworthiness and Systems Safety Assessment

Session Code: AES7

Room Ballroom C

Session Time: 1:30 p.m.

Since its publication in 1996, the use of AEP4754A has become widespread across the aerospace industry. Updates incorporated in the latest revision of the document are covered, along with specific concerns for aircraft systems safety, such as associated Design Assurance Levels, redundancy, engine containment, lightning threat, atmospheric neutron single event effects (SEE) and fuel tank failures.

Time	Paper No.	Title
1:30 p.m.	ORAL ONLY	SAE Approach to Standards and the S-18 Safety Assessment Committee John C. Dalton, Boeing Co.
2:00 p.m.	ORAL ONLY	Structured Development per ARP4754A & Benefits Beyond Certification In 2010, the SAE S-18 Committee completed the revision and publishing process of ARP4754A, & Guidelines for Development of Civil Aircraft and Systems. This revised recommended practice includes the guidelines for developing aircraft and system functionality using a structured process with activities and objectives of the process determined by the safety aspects of the functions being developed. A development assurance level modulates aspects of the process based on the safety aspects such that more rigor is applied in the process for the more safety critical functionality. Eric M. Peterson, Electron International II Inc.
2:30 p.m.	ORAL ONLY	Title TBD Xupo Ou Yang, CAAC

3:00 p.m.

ORAL ONLY

Honeywell TSO Process in Response to FAA Order 8110.37E

TSOA applicants have typically used software and AEH Designated Engineering Representatives (DERs) in their software and AEH development processes in support of the TSOA applicant's statement of conformance to the applicable TSO standard(s). Previous policy allowed these DERs to submit FAA Form 8110-3, for approval of life cycle data, as evidence of compliance to the RTCA/DO-178 and RTCA/DO-254 objectives. With the release of FAA Order 8110.37E, effective May 30, 2011, use of the FAA Form 8110-3 is no longer allowed in support of an application for TSOA. The FAA has removed the approval delegation of software and AEH for approvals done under the TSOA process. The applicant's statement of conformance serves as evidence that all applicable objectives of DO-178 & DO-254 have been met. In response to this change in policy, Honeywell has implemented an internal program to manage the TSO Approval process which closely parallels the previous system whereby DERs were used, providing a structured methodology for approving data in support of TSO Authorizations and subsequent modifications. This discussion will outline the internal program used by Honeywell which has received positive comments from the FAA and given greater flexibility for Honeywell to utilize its global resources.

Chunjing Wang, Honeywell (China)

Tuesday, June 10

Aerospace Modeling and Simulation

Session Code: AES1

Room Ballroom C

Session Time: 4:00 p.m.

This session will focus on the latest technology developments in modeling and simulation for aircraft systems. Topics will include component simulation, simulation interface control, systems engineering, systems integration, and system optimization.

Organizers - James Sherman, SAE International

Time

Paper No.

Title

4:00 p.m.

ORAL ONLY

Mathematical Model of Water Contamination in Aircraft Fuel Tanks

Water is a contaminant that can lead to fuel system icing, microbial contamination, corrosion and fuel quantity gauging problems and therefore an efficient water management system is required in order to maximise the performance of an aircraft's fuel system. This paper describes a time-transient aircraft fuel tank model with water contamination, due to the principal mechanisms of dissolution, suspension, condensation and transportation. The tank model presented is a component of the NEPTUNE fuel system model which was developed for Airbus using the A380 as an example aircraft. A description of the physics of water contaminated fuel is given and of how this has been incorporated into a mathematical model of an aircraft fuel tank. A modular approach is demonstrated which enables interconnecting fuel tanks to be configured in larger systems in a flexible and easily understood manner.

Joseph K-W Lam, Airbus Operations, Ltd.

4:30 p.m.

ORAL ONLY

Electrical Wiring Interconnect Systems (EWIS) Requirements & the Business Challenge

A series of fatal aircraft accidents between 1996 and 1999 focused regulators on wiring-related failures, resulting in the creation of the Electrical Wiring Interconnect Systems (EWIS) requirements, FAR Part 25, Subpart H. This relatively new mandate has OEMs not just scrambling to meet the requirements, but also re-evaluating and improving internal business processes and their supplier relationships.

John Low, Mentor Graphics Corp.

Tuesday, June 10

Closing Panel: Global Standards Harmonization and Safety Issues

Session Code: AESPANEL

Room TBD

Session Time: 4:00 p.m.

This panel will highlight where problems occur during the design process and provide insight into how to prevent design issues before they affect the overall process.

Moderators - Bradley Perret, Aviation Week

Panelists - Lionel Burgaud, Aeroconseil; John C. Dalton, Boeing Co.; Joe Reyes, Honeywell (China); Xupo Ou Yang, CAAC;

Wednesday, June 11

Supplier Management and Standardization

Session Code: AES4

Room Ballroom C

Session Time: 9:00 a.m.

The session will discuss various supplier management techniques, standardization, and quality assurance practices. Discussions will cover standardization efforts with respect to AS9100C, ARP9134, AS9111W, and associated documents.

Organizers - James Sherman, SAE International

Time	Paper No.	Title
9:00 a.m.	ORAL ONLY	Aircraft Manufacturer Responsibilities and Supply Chain Management Gaston Fojutowski, Bureau Veritas
9:30 a.m.	ORAL ONLY	SAFRAN & Snecma Quality Policy and Suppliers' management <i>The presentation will remind the major components of SAFRAN Quality Policy including 2013 revision elements. Alignment of suppliers' requirements, suppliers' performances measurements, suppliers' management with respect to global policy will be detailed. In addition explanation of suppliers quality requirements elaborated both in the frame of International Aerospace Quality Group and Aerospace Engine Suppliers Quality Group will be provided.</i> Cherif Khelil, SNECMA
10:00 a.m.	ORAL ONLY	The Airworthiness certification program and MRO planning for C919 aircraft <i>This presentation is going to talk about the process of airworthiness certification and MRO planning for C919 aircraft. It is to present more details about the reliability consideration in the program.</i> Ren He, Commercial Aircraft Corp. of China, Ltd.
10:30 a.m.	ORAL ONLY	Preparing for a Widebody Twin-Aisle Engine Jinzhang Feng, Meggitt Shanghai

Wednesday, June 11

Engine Systems

Session Code: AES6

Room Ballroom C

Session Time: 11:00 a.m.

This session will address the latest technology solutions and methodologies used by engine designers to mitigate or reduce the effects of noise and vibrations, ensure structural integrity, and engine containment.

Organizers - James Sherman, SAE International

Time	Paper No.	Title
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- 11:00 a.m. ORAL ONLY** **The Innovative Thinking On Civil Engine Module Development**
This report introduces the civil high bypass ratio engine components design technology and application. It describes the high bypass ratio fan / IPC and high bypass ratio multi-stage low-pressure turbine design technologies and applications, specifically including the ζ curved-swept ζ fan rotor blade design, wide-chord fan rotor blade design/manufacturing, fan containment case design / manufacturing, fan rotor aerodynamic / acoustic integrity design, multi-stage low-pressure turbine aerodynamic optimization design, high-load low-loss turbine blade design and other technical applications. Last comes the prospect of the developing trend of civil high bypass ratio engine components design technology.
 Wu Xin, Shenyang Engine Design & Research Inst.
- 12:00 p.m. ORAL ONLY** **Hexavalent Chromium Replacement**
Mist in hexavalent (Cr6+) state released during the hard chrome plating process has been known to be carcinogenic. Most at risk are workers associated with the plating processes. Ground water contamination is also an issue. As a result, many nations, including the US and EU, are restricting the use of hexavalent chromium. Honeywell Aerospace has developed electroplating Cobalt Tungsten and Nickel Tungsten to replace hard chrome plating for internal surface applications such as Flow Body Valve and other intricate parts.
 Cao Gangmin, Honeywell (China)

Wednesday, June 11

Health Monitoring & Management for Maintenance

Session Code: AES3

Room Ballroom C

Session Time: 1:30 p.m.

This session seeks to cover advances in diagnostic, prognostic, and health management technology as applied to aircraft and engine systems (i.e., FADEC) to assist in meeting safety/economic (reliability) constraints while minimizing size/weight. Topics include, but are not limited to, system design concepts that aid in detecting/predicting impending failures, determining remaining useful capability, adapting system operation, and supporting decisions for maintenance/repair and associated interfacing.

Organizers - James Sherman, SAE International

Time	Paper No.	Title
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| 1:30 p.m. | ORAL ONLY | IVHM and the Civil Aircraft of the Future
<i>The goals that are being set for aviation growth in the near future, combined with the growth in service provision, are unattainable without active health management of airplanes. Numbers associated with door to door travel time and accident rates, coupled with availability demands to provide cost-effective transport, simply do not allow time for unscheduled maintenance. Therefore we are going to experience a step jump in the take up of Integrated Vehicle Health Management (IVHM) on these platforms in order to give accurate warning of sub-system and component degradation, allowing for maintenance to be carried out in a timely, scheduled, manner.</i>
Ian K. Jennions, IVHM Centre Cranfield University |
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- 2:00 p.m. ORAL ONLY** **Technical Committee and the Role of Standards in PHM**
The recently constituted IVHM Steering Group has been coordinating the role of many technical committees in developing and disseminating knowledge about system and vehicle health management technologies and processes within the aerospace community. Dr. Rajamani will discuss the role of two key committees in this endeavor, the four decade-old E-32 (propulsion health management) TC and the HM-1 (integrated vehicle health management) TC. He will outline the history of these committees, the documents that are being worked on, and the documents that are in the pipeline. In particular, he will emphasize the role of these committees in developing guidelines for system certification of both fixed wing and rotorcraft health management systems. He will also share with the audience his personal history of involvement in these committees and some thoughts on what he believes are the benefits to be had by participating.
Ravi Rajamani, Meggitt PLC
- 2:30 p.m. ORAL ONLY** **Key Elements in Implementing Health and Maintenance Management Systems for Aircrafts and Engines**
Integrated vehicle health management (IVHM) and condition-based maintenance (CBM) have been receiving increasing acceptance by end users for their products that are safety critical and/or with high level of maintenance needs. IVHM and CBM, if implemented properly, can reduce system down time, increase system reliability, increase system availability and readiness, enhance safety, reduce burden on vehicle operators and maintainers, and reduce operational and support (O&S) costs.
Ginger Shao, Honeywell Intl. Inc.

Wednesday, June 11

Electronics Standardization and Design

Session Code: AES2

Room Ballroom C

Session Time: 3:30 p.m.

The session will discuss practices for certification and will address DO-178 Software Considerations in Airborne Systems and Equipment Certification and DO-254 Design Assurance Guidance For Airborne Electronic Hardware as well as the use of Commercial Off-The-Shelf designs.

Organizers - James Sherman, SAE International

Time	Paper No.	Title
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| 3:30 p.m. | ORAL ONLY | SW and HW Certification: Future Challenges and User Initiatives to address them

<i>On the software side, the presentation will introduce the transition between DO178B and DO178C documents, and the associated regulation. On the hardware side, clarifications in the DO254 context are still necessary after 10 years of experience and will be highlighted. To deal with those challenges, the Industry created some initiatives in order to identify the practical issues, share experiences and propose ways to solve the issues, in relation with Authorities. Such initiatives, like the DO254 User Group of the Forum of Aeronautical Software, will be introduced as well.</i>

<i>Lionel Burgaud, Aerospace Valley</i> |
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- 4:00 p.m.** **ORAL ONLY** **Reducing Complexity of Advanced Integrated Systems: Impact on Certification**
- IMA architectures target the reduction of aircraft operation and maintenance costs. They are designed to reduce electronic control unit (ECU) cost, improve the commonality of parts, minimize the number of computing modules, and reduce wiring, the number of connectors and weight. Beyond obvious weight and maintenance complexity reduction benefits, IMA supports design of new integrated functional capabilities which could not be implemented in a federated system.*
- IMA systems consist of DO-254 and DO-178 certifiable components and modules, which can be utilized to design a range of integrated embedded platforms according to DO-297 guidelines. IMA relies on embedded resource sharing which is essential for design of advanced integrated systems, and imposes a significant stress on system architects providing evidence on correct behavior of a huge number of interactions and interfaces in the system. In order to prevent exponential complexity increase for those critical integrated systems, different embedded platform architecture patterns can be applied. In this presentation, different approaches for minimizing system complexity and certification effort for future architectures will be presented.*
- Xie Hao, TTech.
- 4:30 p.m.** **ORAL ONLY** **Certification of On-Board Electronics In China**
- The presentation introduces the publication process of China's CTSP standards, as well as the research and launch route of CTSO standards by the Civil Aviation Administration in the short future; the speaker will review the certification progress and evidence obtained for on-board electronics, discussing key issues for airworthiness certification, and possible requirements from the authority, possibly on structural design assurance system, quality and configuration, software and hardware verification, cosmic radiation, environmental test capabilities, etc.*
- Peng Wang, CAAC
- 5:00 p.m.** **ORAL ONLY** **Process Improvement In ACTRI Context**
- Certification is one of the challenges of Chinese aviation companies with the development of their civil aircraft program. The presentation will introduce ACTRI successful practice in SW&AEH process improvement in the past few years. Also, the safety analysis of some special systems (such as IMA, airborne network, etc) are proposed to discuss at the end of the presentation*
- Lirong Tian, CAAC