EVENT GUIDE

Includes Final Program and Exhibit Directory

SAE INTERNATIONAL

COMAC

SAE 2017 AVIATION TECHNOLOGY FORUM

航空技术论坛

June 6 - 7, 2017

Doubletree by Hilton Hotel - Shanghai Pudong
www.sae.org/events/atf

INSPIRING BUILDING ADVANCING

PEOPLE, TECHNOLOGY, AND INDUSTRY—ALWAYS IN MOTION AND LOOKING TOWARDS TOMORROW.

A professional society, SAE International is the authority on vehicle engineering. We develop more vehicle technical standards—and more aerospace standards—than any other organization. We offer the largest library of vehicle engineering content. And, we bring together the largest global network of engineers in the world.

Through a comprehensive collection of programs, products and services, we supply the information, tools, and technical know-how to help today's professionals do their jobs better while we ensure the development of the next generation of mobility engineers.

Since 1905, SAE has connected automotive, aerospace, and commercial vehicle engineers to each other and the technical resources needed to foster a lifetime of learning, solutions to improved vehicle technology, and the advancement of the mobility industry.

SAE International—whose first vice president was an up-and-coming engineering talent by the name of Henry Ford and included early supporters like Orville Wright—was based on providing a platform for collaborative and informed dialog and the impetus of its earliest standardization efforts. Today, the sharing of information remains at its core, with SAE being acknowledged globally as the ultimate knowledge source for mobility engineering.

YOUR ULTIMATE KNOWLEDGE SOURCE FOR MOBILITY ENGINEERING.

WHATS INSIDE

SAE 2017 Aviation Technology Forum

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Should a catastrophic event occur, attendees should follow the safety and security instructions issued by the facility at the time of the event. This includes listening for instructions provided through the public address system and following posted evacuation routes if required.

In the event of an emergency or a major disruption to the schedule of events at the (insert event name), attendees and exhibitors may call this number to receive further information about **the resumption of this event. Updates will also be provided via the SAE website at http://www.sae.org**

SAE Emergency Hotline

Phone:+86-21-6140-8900(China)
Phone: +1-800-581-9295 (U.S.)

HOSTS INTRODUCTION

SAE International is a global association of more than 145,000 engineers and related technical experts in the aerospace, automotive and commercial-vehicle industries. SAE International's core competencies are life-long learning and voluntary consensus standards development.

SAE International has been facilitating the development of global standards for the aerospace industry since its introduction of the first interchangeable spark plug standard. And while known for producing the most mobility engineering standards, the fueling of a century worth of aerospace industry advancement has helped earn SAE the position of being the world's largest, most respected aerospace (SDO).

Global standards are essential for aircraft certification airworthiness and interoperability. As the leading aerospace SDO, SAE International works with industry, government, and regulatory agencies throughout the world to create an extensive family of international standards that form the technical basis of regulations and government requirements.

SAE's global standard development role can be seen in its technical committee rosters, which include 15,000+ experts from 56 countries—with European committee participation instances alone around 4,000. In Aerospace, Its 289 committees and task force—representing industry (airframers, suppliers, operators, MROs), regulatory authorities, military agencies, researchers, and consultants—serve the full spectrum of aerospace businesses in both the commercial and military sectors thereby meeting the engineering, advanced technology, safety, regulatory, and defense needs of a world market.

Commercial Aircraft Corporation of China, Ltd. (COMAC) is a centrally managed core enterprise in civil aircraft industry of China and a central backbone enterprise, which is formed with the approval of the State Council, jointly invested by State-Owned Assets Supervision and Administration Commission (SASAC) of the State Council, Shanghai Guo Sheng (Group) Co., Ltd., Aviation Industry Corporation of China (AVIC), Aluminum Corporation of China Limited (CHALCO), China Baowu Steel Group Corporation Limited, and Sinochem Corporation, and headquartered in Shanghai. Mr. Jin Zhuanglong serves as the Chairman and Secretary of the Party Committee of COMAC, and Mr. He Dongfeng as the President.

COMAC functions as the main vehicle in implementing large passenger aircraft programs in China. It is also mandated with the overall planning of developing trunk liner and regional jet programs and realizing the industrialization of civil aircraft in China. COMAC is engaged in the research, manufacture and flight tests of civil aircraft and related products, as well as marketing, servicing, leasing and operations of civil aircraft. The company has nine member organizations: Design, Research and Development Center of COMAC (Shanghai Aircraft Design & Research Institute), Manufacturing and Final Assembly Center of COMAC(Shanghai Aircraft Manufacturing Co Ltd.), Customer Service Center of COMAC (Shanghai Aircraft Customer Service Co., Ltd.), Beijing Research Center of COMAC (Beijing Aeronautical Science & Technology Research Institute), Civil Aircraft Flight Test Center of COMAC, Capability & Supporting Center of COMAC (Shanghai Aviation Industrial (Group) Co., Ltd.), News Center of COMAC (Shanghai Commercial Aircraft Magazine Co., Ltd.), COMAC Sicuan Branch (In Preparation), and COMAC America Corporation. COMAC has also had its Beijing Office, U. S. Office and European Office in Beijing, Los Angeles and Paris respectively, and set up a Financial Service Center in Shanghai. COMAC is a shareholder of Chengdu Airlines Co., Ltd. and SPDB Financial Leasing Co., Ltd.

EVENT OVERVIEW

June 6, Tuesday

09:00 - 10:00	**WELCOME AND INTRODUCTION** **KEYNOTE - COMAC'S WIDEBODY AIRPLANE PROJECT**
10:00 - 10:30	Tea Break
10:30 - 11:45	**OPERATIONAL & MAINTENANCE REQUIREMENTS FOR THE CHINA MARKET** This session will provide an overview of the in-service performance of the ARJ-21, expected performance for C919, and how these programs will influence future designs. In addition, maintenance challenges and successes with using the A320 or B737 in the China market.
11:45 - 12:15	**ADDITIVE MANUFACTURING (PART 1)** The session provides project presentations in the application of Additive Manufacturing to aircraft design and manufacturing, including the solutions realized by the implementation of the technology. The session will focus on the features, benefits and capabilities of the various technologies.
12:15 - 13:15	Lunch & Networking Break
13:15 - 14:45	**PANEL - PHM FOR THE AEROSPACE VALUE CHAIN** This panel seeks to cover advances in diagnostic, prognostic, and health management technology as applied to aircraft and engine systems to improve operations in the entire value chain. The topics include the use of PHM techniques in system design, testing, manufacturing, operations, and maintenance. World authorities in the area of PHM technologies will tackle topics such as, cost benefit analysis and systems requirements for IVHM systems, PHM of manufacturing systems, design of diagnostics and prognostics analytics, and supply-chain optimization. In this age of highly connected systems, these experts will touch upon the implications of big data and cloud computing for this field.
14:45 - 15:15	Tea Break
15:15 - 17:15	**MODEL-BASED SYSTEMS ENGINEERING** Model-based systems engineering (MBSE) is the formalized application of modeling to support system requirements, design, analysis, verification and validation activities beginning in the conceptual design phase and continuing throughout development and later life cycle phases. This session will provide practical solutions to engineering problems using MBSE.

June 7, Wednesday

09:30 - 10:00	**ADDITIVE MANUFACTURING (PART 2)**
10:00 - 10:30	Tea Break
10:30 - 12:30	**ADVANCED MATERIALS AND AIRCRAFT MANUFACTURING** This focus of this session is the latest technology developments in materials and manufacturing used for aerospace design and manufacturing, from structures to skin, to include new alloys and composites using robotic techniques.
12:30 - 13:30	Lunch & Networking Break
13:30 - 15:00	**AIRPLANE CERTIFICATION AND GLOBAL CHALLENGES** This session discusses the practices for global certification for aircraft with perspective from both domestic and global regulatory bodies. The presentations will provide insight into how CAAC and the FAA/EASA organizations work together to share certification data and evaluate projects for certification. In addition, SAE will provide an overview of how to navigate the certification process utilizing industry standards.
15:00 - 15:30	Tea Break
15:30 - 17:00	**PANEL - C919 LESSONS LEARNED TOWARDS ACHIEVING FIRST FLIGHT** This is an interactive panel, featuring members of the certification process, discussing the challenges overcome and the lessons learned in achieving C919's first flight. The discussion will address the development of various certification artifacts and the Safety of Flight Assessment.

The purpose of this session is to provide an open exchange of ideas. Remarks made by participants or members of the audience cannot be quoted or attributed to the individual or their company unless express permission has been granted by the individual and their company. Any record of remarks, discussion, or photographs may not be used unless express permission has been granted by the individual and their company.

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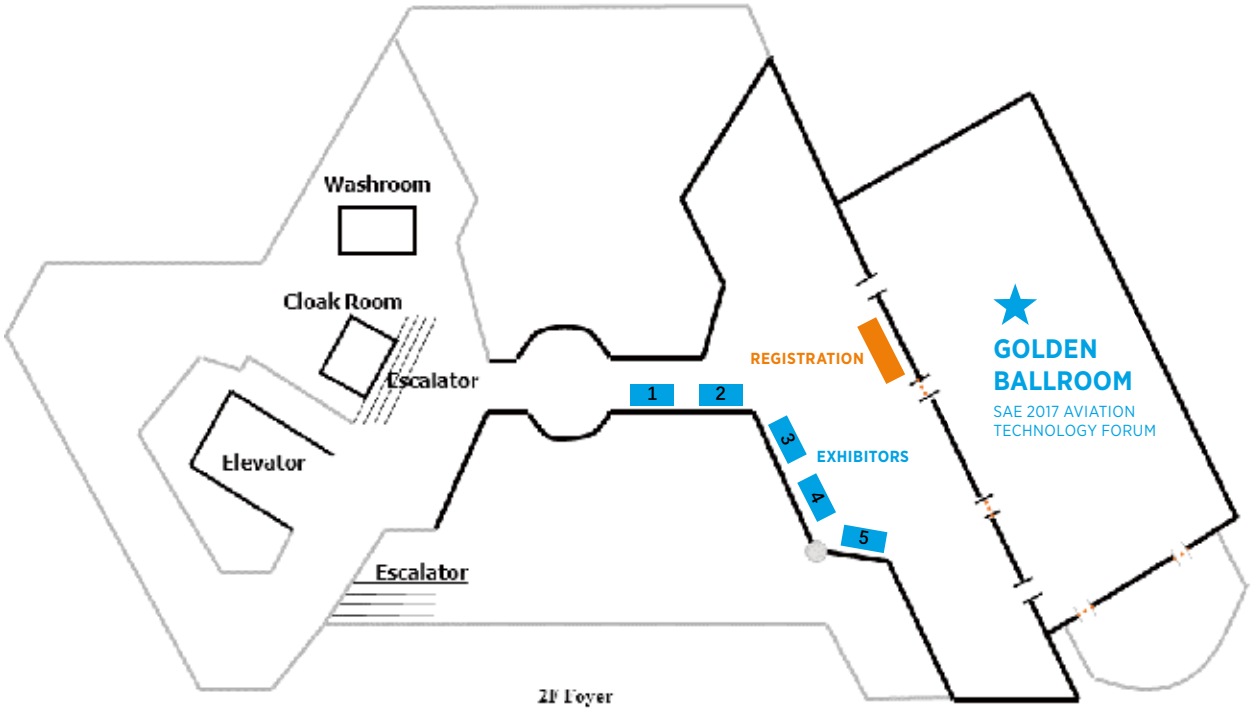


ORGANIZERS

Garry Lee, Honeywell
Richard Sheng, COMAC
Vahid Navidi, Aviage Systems
Istvan Szabo, Meggitt

SAE 2017 AVIATION TECHNOLOGY FORUM STAFF TEAM

Sherry McCaskey
Event Manager
Sherry.Mccaskey@sae.org

James Sherman
Technical Program Developer
James.Sherman@sae.org

Kristie Saber
Content Administrator EEDM
kristie.saber@sae.org

Arlene DiSilvio
Event Sales Manager
Arlene DiSilvio@sae.org

Katie Watenpool
Marketing Communications Strategist
katherine.watenpool@sae.org

Alan Ao
Manager, Events & Aerospace Standards, China
Alan.Ao@sae.org

Will Chang
Marketing Program Manager, China
Will.Chang@sae.org

Rick Wang
Project Coordinator, China
Rick.Wang@sae.org

Jay Jiang
Event Business Development, China
Jay.Jiang@sae.org

Tuesday, June 6

Welcome and Introductions

09:00

Billy XU, *General Manager, China - SAE International*

Guanghui WU, *Vice President - Commercial Aircraft Corporation of China, Ltd.*

Keynote

09:15

COMAC's Widebody Airplane Project

Jinhai YU, *Head of the Department, Overall Aerodynamics - COMAC*
Senior Project Manager, Overall Integration Team of Wide-body Aircraft Project - Shanghai Aircraft Design and Research Institute

ABSTRACT

This presentation makes an analysis of the civil aviation transportation market's demand for passenger aircrafts, especially for wide-body aircrafts, introduces main features, layout, performance and development process of three models of COMAC and summaries advanced technologies of wide-body aircrafts in aerodynamics, composites and systems.

Operational & Maintenance Requirements for The China Market

10:30

How to Win the Space & Time for the Growth of Civil Aircraft?

Liqing MENG, *Senior Engineer - Chengdu Airlines*

ABSTRACT

Starting from the analysis of the actual operation of ARJ21, the presentation will focus on the solution to the maintenance problems faced by new model aircraft in the initial operation stage. The presentation will discuss an evaluation system built on characteristics and development need of enterprises with continuous analysis and monitoring functions. It dynamically inputs scientific information instruction into enterprise organizational structure and provide scientific basis for enterprises' decision-makers. The presentation calls for an aircraft structural management system to lay a solid foundation for the future development of aircraft intelligent health management system.

11:15

IBM Cognitive MRO Solution for China Aviation Industry

Zhongke XU, *Senior Consultant - IBM*

ABSTRACT

In current aviation MRO business area, airlines and MRO providers face many challenges, such as multiple A/C types, multiple owners, multiple locations, multiple operations and multiple authorities & regulators. IBM Maximo for Aviation and Watson IoT Platform delivers comprehensive asset management for both Airlines M&E business and aircraft customer service, helping airlines and MRO providers to more effectively manage their aircraft and to improve Maintenance & Flight operations activities, and cognitive insight of business.

Additive Manufacturing (Part 1)

11:45

Accelerating The Additive Revolution – GE Additive Solution Introduction and Examples

Patrick WANG, *Executive Engineering Site Leader - GE Aviation*

This Presentation has been rescheduled from Additive Manufacturing Session of Day 2.

Panel - PHM for the Aerospace Value Chain

13:15

This panel seeks to cover advances in diagnostic, prognostic, and health management technology as applied to aircraft and engine systems to improve operations in the entire value chain. The topics include the use of PHM techniques in system design, testing, manufacturing, operations, and maintenance. World authorities in the area of PHM technologies will tackle topics such as, cost benefit analysis and systems requirements for IVHM systems, PHM of manufacturing systems, design of diagnostics and prognostics analytics, and supply-chain optimization. In this age of highly connected systems, these experts will touch upon the implications of big data and cloud computing for this field.

13:15

MODERATOR

Ravi Rajamani, *Principal Consultant - drR2 Consulting*

PANELISTS

Leon MA, *Testability Team Leader, S.R.M & Product Support Department Shanghai Aircraft Design & Research Institute*

Kai SI, *PHM Lead Engineer - Quality Engineering Technology Center of China Aero-Polytechnology Establishment*

David HE, *Professor, Department of Mechanical and Industrial Engineering - Univ. of Illinois*

Zongchang LIU, *Vice President - CyberInsight*

Artie Dins, *Senior Advanced Research Scientist - Honeywell Aerospace*

Model-based Systems Engineering

15:15

MBSE Engineering Applications in The Development of Civil Aircrafts

John ZHANG, *Technical Leader of Computation & Simulation Lab (CSL) Beijing Aeronautical Science & Technology Research Institute*

ABSTRACT

Model-based System Engineering (MBSE) is widely used in the fields of civil aircraft development recently. This presentation first explores the status and quo of MBSE engineering applications in major aircraft OEMs. Then based on the bench- mark of MBSE, the presentation provides and researches multiple perspectives of MBSE engineering applications including but not limited to implementation roadmap, modeling guidelines, MBSE engineer development, implementation challenges and best practices, and other influencing factors by using an engineering example.

15:45

Building IMA System Configuration with The Model-Based System Engineering Method

Haojie JIN, *Tool Software Development Engineer - Aviage Systems*

ABSTRACT

Building IMA system configuration is one of the major tasks for IMA integration. It involves supplier requirement capture, system configuration and verification. To mitigate the increase in aircraft system complexity and short development schedules, AVIAGE utilizes the Model-Based System Engineering (MBSE) technology to overcome the challenges. This presentation will introduce the practice of applying MBSE to build IMA system configuration for C919. It will introduce how AVIAGE utilizes the model-centralized approach in the life-cycle phases for IMA system configuration development, including establishing and managing the system model, capturing customer requirements and conducting system impact analysis, generating configuration artifacts and verifying them. Future challenges and potential solutions will be also outlined and discussed.

16:15

Virtual Autonomous Fast-Time Exploration of Large Domains of Complex/ Unknown Flight Situations for Safety through Lifecycle: Present, Future, Benefits and Pitfalls

Ivan Burdun, *President & Directeur Scientifique - AIXTREE S.A.S.*

Alexander GREBENKIN, *Head of Department # 901 - Moscow Institute of Electromechanics and Automatics (MIEA) JSC*

ABSTRACT

Virtual flight testing and certification (VFTC) technology has a proven track record of successful validations and applications for a number of aircraft types and design projects. The goal of VFTC process is to predict branching dynamics of the 'pilot/automaton - aircraft - operating environment' system and evaluate the system's safety performance in complex (multifactor, off-nominal, critical, hazardous, anomalous) or unknown flight situations - before an aircraft is built/flown. The technology's exploratory power is due to the synergy of high-fidelity mathematical modeling, fast-time simulation, situational control, artificial intelligence, knowledge mining and mapping, and some other techniques.

16:15 **ABSTRACT (Continued)**

VFTC is thought to become a 'bridge' between a vast library of potentially unsafe complex/unknown flight situations (baseline scenarios exacerbated by the presence of several risk factors) and latest achievements in computing and information technology. Baseline scenarios are derived from airworthiness regulations, test programs, standard operating procedures (e.g. AC120-71A/B), training syllabuses, accident/incident reports, pilot's manuals, or flight operation/simulator data records. Risk factors include pilot errors/inaction/inattention, onboard hardware failures, automatic control logic/data errors, adverse weather conditions, and design/equipment options.

The outcome is a tree-type database incorporating thousands of complex flight situations ('what-if' cases) built around each baseline scenario, and a collection of 'a bird's eye view' knowledge maps representing the system dynamics and safety performance - for qualitative/quantitative analysis and knowledge synthesis. The following categories of specialists can benefit from VFTC through the lifecycle: designer (aerodynamics, flight control, powerplant), test engineer/pilot, regulator, instructor/student, line pilot, safety engineer, investigator, and scientist.

As an innovative flight research method, VFTC is characterized by the challenges, successes and pitfalls of growth. In this presentation, an overview of the technology's current and future capabilities is given, including prospective off-board and onboard applications. VFTC benefits are summarized for main user categories. Advantages and limitations of the developed solution approach are discussed in comparison with other flight research methods.

16:45 **3D Electromagnetic Simulation for Aircraft EMC**

Marco Kunze, *Principal Engineer - CST-Computer Simulation Technology AG*

ABSTRACT

The 3D electromagnetic (EM) simulation is a well-accepted design and development method for many applications. Microwave and RF engineers are using EM simulations since the 70th of the 20th century. But that's different for EMC engineers. Still today testing is the preferred method. Often testing and simulation are even considered as competitive. But both methods have pros and cons and it's advisable to benefit from both.

International authorities as FAA and EASA set basic requirements for safe aircraft operation in harsh EM environments as HIRF and lightning. To demonstrate compliance aircraft testing is used which is expensive, time-consuming and only possible when mock-ups are available. It's important to note that solving design issues late in the development phase of an aircraft can become very expensive.

But today it's also possible to use digital mock-ups in computer simulation and visualization. Working in a virtual environment offers the advantage that it can be used at any stage of an aircraft development process. A key feature of the EM simulation even is the visualization of EM fields which can't be offered by testing. For instance knowledge about the internal EM environment of an aircraft where the avionics and cable harnesses are situated is important to avoid system failures and to protect aircrafts against catastrophic effects.

Lightning is a serious threat to aircraft. EM simulation can be used for zoning analysis and lightning EM pulse (LEMP) simulations, such as for instance the EM field coupling into fuselages and with it into cables. An approach for aircraft zoning to characterize initial attachment zones of an aircraft based on electrostatic simulations will be discussed. 3D EM full wave simulation technologies in time domain to characterize signals on cable pins and the internal EM environment of aircrafts will also be presented along with simulation results.

Wednesday, June 7

Additive Manufacturing (Part 2)

09:30

SAFRAN's Vision of Additive Manufacturing Challenges to Enlarge its Application

Thierry Thomas, *Vice President of Safran Additive Manufacturing - SAFRAN Group*

ABSTRACT

Additive Manufacturing covers a set of rapidly expanding technologies that have the potential to profoundly transform the way in which the aviation industry develops, manufactures, or maintains its products. . These technologies enable designers to access to new shapes, materials and functions that are unattainable by conventional means. Furthermore, Additive Manufacturing may drive main change in our traditional industries as well as main impacts on business models. To take quickly and fully benefit from additive manufacturing technologies and have an organization able to face these challenges, Safran has decided to create a multidisciplinary competence center dedicated to AM within SafranTech: "Safran Additive Manufacturing".

The proposed presentation will give us the opportunity, to present challenges identified by Safran Additive Manufacturing that will have to be mastered in order to enlarge AM use. These challenges are metallurgical, mechanical, numerical but also Human. As a matter of facts, the new paradigms open by AM will need engineers to look at products and services differently to take the best of it and so need to be trained and encouraged for that.

Advanced Materials and Aircraft Manufacturing

10:30

A Few Issues on The Composite Wing F&DT Design

Chuanjun LIU, *Deputy Chief Engineer - Beijing Aeronautical Science & Technology Research Institute*

11:00

Integrated Structural and Process Simulation Solution for Advanced Composite Structure in Aerospace Industry

Xiao YE, *Composite Engineer - Siemens*

ABSTRACT

Advanced thermoset composite structure, with its proven success in aerospace industry, has gain increasingly larger popularity in other sectors, such as transportation, automotive, ship building, sport, etc. However, with greater performance comes greater challenger in process and structural analysis.

During manufacturing, process induced defects (shape distortion and residual stresses) has been a well-known bottleneck, especially in thick parts. These phenomena is a result of a convoluted combination between the low thermal conductivity of the composite and the large heat of reaction released during the crosslinking reaction. The temperature and degree of cure gradients, the chemical shrinkage, and constraints from the mold altogether lead to the development of residual stresses in the manufactured part and eventually a distorted shape after demolding. Current engineering remedy for this issue is usually shimming and reshaping of the mold, which often times require multiple trial and failure iteration.

During deployment, composite structure display different structural response compared to the traditional metal structures, specifically failure mode: complex progressive damage and buckling.

Siemens provides an integrated composite solution for the manufacturing process and structural analysis of advanced thermoset composite structures. For process simulation, it is capable to take into account the process parameters, evolving material history during the curing process as well as the thermal and mechanical interaction between the part and mold. Result of the simulation include the time-dependent internal stress, deformation, temperature distribution and degree of cure of the part during curing and after de-molding. With the help of this solution, one can accurately analyze the influence of these different inputs on the mechanical behavior of the composite part, and also fine tune the curing process parameters and the mold shape on a real part. For structural analysis, it provides a number of industrial proven progress damage material model that has been embedded in the commercial software as well as strong linear/non-linear buckling analysis capability that has been used in major Aerospace companies worldwide.

11:30	**CFRP Production and Assembly Technologies for Large Aircraft** ***Alexander Rajtschan,*** *Technical Director / Vice President - Broetje Automation*
12:00	**Wing Assembly System for The C919 with Robotic Drilling** ***Heng FAN,*** *Engineering Manager - Electroimpact*

Airplane Certification and Global Challenges

13:30	**Certification Involvement in Process based Assurance** ***Yong CAI,*** *Senior Engineer & Deputy Director of E&E Division - Shanghai Aircraft Airworthiness Certification Center* **ABSTRACT** Process based Assurance (or Development Assurance, DA), is one possible means for show compliance in Aircraft, System, Software and Hardware area. DA behaves different in ways and technologies when used in different area. That takes challenges for both applicants and certification authorities to demonstrate and evaluate compliance to Civil Aircraft Regulations. Both FAA/EASA and CAAC now try to propose some principles for DA involvement, and maybe take changes in futures certification activations.
14:15	**Comparative Study on CTSO-C153 and ETSO-2C153 on Certification Consideration for Integrated Modular Avionics (IMA) Platform and Modules** ***Frank XIAO,*** *Certification Engineer - Aviage Systems* **ABSTRACT** Integrated Modular Avionics (IMA) platform and modules, hosting many functions that have been historically in functionally and physically separated systems, are being installed on new and modified aircrafts. EUROCAE ED-124 and RTCA DO-297 recognizes an incremental acceptance process for obtaining credit toward approval and certification by finding that an IMA modules, hosted applications, on/or off-aircraft IMA system comply with specific requirements. FAA TSO-C153 was released in May 2002 and has been accepted as main guidelines to authorize IMA hardware modules. To meet the demands of increasing application and certification of IMA platform and modules, EASA and CAAC have successfully released technical standard orders in 2016, respectively ETSO-2C153 for IMA platform and modules and CTSO-C153 for IMA Hardware modules. The CAAC CTSO-153 is for most parts modeled after the FAA guidance, while the EASA ETSO-2C153 appears to have been developed with much more independence and “clean sheet of paper” approach to the CAAC/FAA IMA TSO guidelines. This paper examines both guidance and analyzes the differences in terms of module TSO applicability, IMA platform and System definition, and in general identifies the differences between the CAAC and EASA regulations. Furthermore, a comparative study is conducted for CTSO C153 and ETSO 2C153 on different requirements in the fields of applicability and classes, minimum performance standard (MPS), verification procedures, and testing under standard and environmental conditions.

Panel - C919 Lessons Learned Towards Achieving First Flight

15:30 This is an interactive panel, featuring members of the certification process, discussing the challenges overcome and the lessons learned in achieving C919's first flight. The discussion will address the development of various certification artifacts and the Safety of Flight Assessment.

MODERATOR

Yong CAI, *Senior Engineer & Deputy Director of E&E Division - Shanghai Aircraft Airworthiness Certification Center*

PANELISTS

Jin QIAN, *Chief Pilot - COMAC*
Director - COMAC Commercial Aircraft Flight Test Center

Scott KE, *Wheels and Brakes System Project Engineering Lead - Honeywell*

John LIU, *LEAP-1C Program Director - GE Aviation*

Vahid Navidi, *Chief Engineer’s Office Leader - Aviage Systems*

Billy XU

General Manager, China
SAE International

Guanghui WU

Vice President
Commercial Aircraft Corporation of China, Ltd.

Mr. Wu Guanghui, born in February 1960 in Wuhan of Hubei Province, holds a Doctorate Degree. He graduated from Nanjing Aeronautical Institute majoring in aircraft design with a Bachelor's Degree of Engineering in 1982; and from Beijing University of Aeronautics and Astronautics majoring in aircraft design with a Doctorate Degree of Engineering in 2008.

Mr. Wu joined Xi'an Aircraft Design Institute in 1982, serving successively as Designer, Deputy Director and Director of General Design Department, and in 2003 Vice President of the First Aircraft Design Research Institute of AVIC I. Since 2006, while at First Aircraft Design and Research Institute, he has served successively as President, Chief Designer of ARJ21. He was appointed as Vice President of COMAC, Chief Designer of C919 in March 2008.

He was awarded the Prize for Outstanding Contributions in High-tech Project by the CPC Central Committee, the State Council and the Central Military Commission and won a gold medal in 2007. He received the Special Government Allowance awarded by the State Council. He was awarded with Special National Prize for Process in Science and Technology in 2011, and occupied the No. 1 position.

Member of the 11th and 12th National Committee of the Chinese People's Political Consultative Conference (CPPCC).

Jinhai YU

Head of the Department, Overall Aerodynamics
COMAC

Senior Project Manager, Overall Integration Team of Wide-body Aircraft Project
Shanghai Aircraft Design and Research Institute

Jinhai Yu, researcher, graduated from Nanjing University of Aeronautics and Astronautics in aircraft design in July, 1997. He mainly focuses on overall aerodynamic design of civil aircraft. Currently, he is the head of the department of overall aerodynamics of COMAC Shanghai Aircraft Design and Research Institute and senior project manager of overall integration team of wide-body aircraft project. He has been involved in the development projects of ARJ21 and C919 as well as wide-body aircrafts.

SPEAKER BIOGRAPHIES

Richard (Rich) Sheng **FORUM MODERATOR**

Oversea Expert / Senior Technical Fellow
Shanghai Aircraft Design and Research Institute

Rich is currently an Oversea Expert/Senior Technical Fellow for The COMAC Shanghai Aircraft Design and Research Institute and his main job functions are strategic planning for organizational development, capability building, performance measurement, system engineering, system integration, and training course development. He has over 30 years of experience in Project Management, Proposal Development, System Engineering, Quality Management, Information Technology, and Software Engineering fields. Rich has published six papers in the Journal of the American Society of Civil Engineers and the International Conference of Civil Engineering. He had his three research models patented and copyrighted in 1978, 1994, and 2010. He is also a nationally certified Malcolm Baldrige judge and examiner, specializing in Processes and Strategic Planning; served on California State Baldrige Quality Examiner Board. Rich also speaks fluent Mandarin and English and has good communication skills in both writing and speaking. Recently he has become China National 1000 Plan Expert and also Shanghai 1000 Plan Expert in the Science and Technology field.

Liqing MENG

Senior Engineer
Chengdu Airlines

Liqing Meng holds a PhD of Engineering in solid mechanics. Her area of expertise is impact damage of aircraft composite structures. She is a senior engineer in airworthiness maintenance of civil aviation. She was deeply involved in the field of aircraft maintenance by participating in the design, manufacturing, delivery and operation of the new model of aircraft ARJ21. From May 2011 to November 2015, she worked at the final assembly line of Shanghai Aircraft Manufacturing Co.,Ltd. as the leader of the supervision team for the first batch of ARJ21 to be delivered.

Zhongke XU

Senior Consultant
IBM

Xu has ten years of front-line experience of aircraft maintenance and management. He has CAAC's basic aircraft maintenance license and maintenance license of different types of aircraft/engine models. During his career in the maintenance base of China Eastern Airlines, he focused on drawing up documents on quality assurance system for the base and worked on internal quality. He was also responsible for drawing up reliability management outline for the base and engaged in aircraft reliability management, reliability management software design and development, analysis of aircraft fault/FMECA.

He has 12 years of experience of working for EAM project. He has participated in MRO business consulting projects and IT system projects of several domestic and abroad airline companies.

Patrick WANG

Executive Engineering Site Leader
GE Aviation

As Executive Engineering Leader for Aviation in China, Patrick Wang is leading the engineering activities in China region, developing and promoting GE Aviation growth in China, which includes services engineering, supply chain engineering support, engine system integration and aviation digital.

Patrick Wang started his engineering career in China Xinhua Airlines. Patrick Wang joined GE Engine Service (Xiamen) as engineering and customer support manager in 2001. He transferred to GE CTC (China Technology Center) in May 2003 as the ARJ21 on-site system integration leader. Patrick was promoted to lead the entire GE Aviation China Engineering team in 2008. Under his leadership the China engineering team successfully built many new capabilities from zero in China. Patrick received GE Aviation Globalization Award in 2012 and Aviation Engineering Excellent Award in 2014 and 2016.

Patrick Wang was born and grew up in Harbin. He got the bachelor degree in ME from Northwest Polytechnic University in 1993, MBA from Nankai University in 2002 and EMBA from CEIBS in 2012. Patrick Wang started to build model airplane in high school that is why he selected aviation industry as a career. Patrick play aircraft model, likes sports, travel and reading books.

Ravi Rajamani

Principal Consultant
drR2 Consulting

Dr. Ravi Rajamani established drR2 consulting in 2016 to leverage more than 25 years of experience and expertise in data analytics and model-based design to help clients in aerospace and other industries solve diagnostics and prognostics issues. Prior to this, Ravi was an Engineering Director with Meggitt for 5 years, following an 11-year tenure with United Technologies Corporation, first at the Research Center, and then with its Pratt& Whitney division. Before that he was with the General Electric Company for 10 years. He was closely associated with its Research Center and its Power Generation business; but worked with all other businesses as well. Before joining Meggitt, his primary work was in the area of controls and diagnostics of gas turbines for aerospace and industrial applications. At Meggitt, Ravi worked on a variety of technology initiatives, with a focus on diagnostics and prognostics and on model-based design. Ravi has a BTech (ME) from IIT Delhi, an MS (Automation) from IISc, Bangalore, and a PhD (EE) from the University of Minnesota. He also obtained an MBA from the University of Connecticut. He has published four book chapters; numerous papers in refereed journals and conference proceedings; has been invited to speak at conferences and institutions around the world; and has 26 patents to his name. He is active within SAE's Propulsion Health Management (E-32) and Integrated Vehicle Health Management (HM-1) committees, currently serving as the chair of HM-1. He is also active in the PHM Society, serving on its board of directors, and he was the general chair of the 2014 European PHM conference in Nantes, France. In April 2016, Ravi was named a Visiting Professor of Aerospace, Transport and Manufacturing at Cranfield University in Cranfield, UK. He is a chartered engineer and a fellow of the IMechE in the UK. He also serves as a board member of the Edison Tech Center in Schenectady.

Leon MA

Testability Team Leader, S.R.M & Product Support Department
Shanghai Aircraft Design and Research Institute

Senior engineer of Shanghai aircraft Design & Research Institute (SADRI), COMAC. Testability & PHM Engineering Supervisor of SADRI. LRWBCA Project Maintainability & Testability engineering team leader. Has been responsible for the following work: Presided over the commercial aircraft maintainability/ testability concept, design, analysis, assessment, test and verification; Aircraft structural and zonal MSG-3 analysis; Commercial aircraft test-flight maintenance program development.

Currently in charge of the PHM concept planning, airborne PHM general scheme design, PHM-oriented testability engineering and system PHM modeling, simulation & assessment in the LRWBCA project.

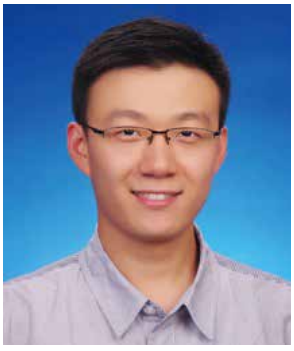
Kai SI

PHM Lead Engineer, Quality Engineering Technology Center
China Aero-Polytechnology Establishment

Kai Si is a PHM lead engineer in the Quality Engineering Technology Center of China Aero-Polytechnology Establishment (CAPE) and the charge person of PHM key laboratory. He is engaged in the research on development and verification of PHM system for many years. He received his master's degree in mechanical engineering from Beijing Forestry University in 2011. His research direction mainly includes the design of PHM system architecture, data analysis and processing, method of condition monitoring/ fault diagnosis/prognostic model establishment, verification and validation, PHM standard and specification research and so on. In 2013, he chaired and accomplished PHM key technological research for one of aircraft hydraulic pump and wheel brake servo valve and other products. In 2015, he had developed PHM system prototype for aircraft hydraulic system and its typical parts. Now he is busily engaged in improving the PHM model accuracy through V&V technology and dissemination PHM technology for intelligent equipment, intelligent home appliances and complex engineering systems. Also as a member of the SAE HM-1 standards committee, he participates in the revision of the IVHM standards.

David HE

Professor, Department of Mechanical and Industrial Engineering
Univ. of Illinois



Zongchang LIU

Vice President
CyberInsight

Zongchang Liu is currently a PhD student at University of Cincinnati Center for Intelligent Maintenance Systems (IMS), and VP for Technical Development at the IMS spinoff company CyberInsight Co. Ltd. He received his bachelor degree from Universith of Michigan in Mechanical Engineering, and Shanghai Jiaotong University in Electrical Engineering. His research experience include developing PHM systems for rotatory systems, high-speed train systems, wind turbine, cargo ships, and battery systems.

SPEAKER BIOGRAPHIES

Artie Dins

Senior Advanced Research Scientist
Honeywell Aerospace

Artie Dins is a Senior Research Scientist at Honeywell Aerospace focusing on Data Analytics and Artificial Intelligence applications. He has contributed to Research and Development programs of Prognostics Health Management for aircraft subsystems and Global Navigation Satellite Systems by adapting modern big data tools to aerospace specific datasets. He holds a Master's degree in Aeronautics & Astronautics from Stanford University and is currently based in Shanghai.

John ZHANG

Technical Leader of Computation & Simulation Lab (CSL)
Beijing Aeronautical Science & Technology Research Institute

Dr. Zhang is currently the technical leader for the Computation & Simulation Lab (CSL) at COMAC Beijing Aeronautical Science & Technology Research Institute. His major technical work at CSL is Model-based System Engineering (MBSE) application in the full-life development cycle of civil aircrafts including but not limited to requirement-driven engineering (RBE), aircraft-level requirement and architecture development, on-board systems modeling and simulation for Virtual Integrated Aircraft (VIA). He obtained his Ph.D. in the fields of dynamic systems and control from the University of Delaware (UD) in 2004, and an MBA in 2010 from UD. He is also a certified Black Belt for Design for Six Sigma (DFSS). His research areas include but not limited to: MBSE, requirement engineering, engine control, model-based development (MBD), modeling and Simulation. He was a senior member of IEEE, and a member of ASME and SAE.

Haojie JIN

Tool Software Development Engineer
Aviage Systems

Haojie graduated from Shanghai University in 2007 with a master degree in Telecommunications Engineering. He then joined Sycamore Networks (2007-2014) where he worked in system, embedded software and integration for telecommunication product. In 2014 Haojie joined Aviage Systems working in IMA and R&D projects mainly focus on the model based engineering process enhancement and tool development. Haojie is currently software tool engineer in AVIAGE SYSTEM based in Shanghai, China.

Ivan Burdun

President & Directeur Scientifique
AIXTREE S.A.S

Ivan Burdun has 37 years' research and academic experience in ex-USSR, UK, USA, Russia, France. His competences include high-fidelity mathematical modeling, artificial intelligence and fast-time simulation of flight for predicting the 'aircraft - pilot/automaton - vehicle - operating environment' system safety performance in multifactor (off-normal/unknown) situations. These techniques have been applied to 30 aircraft types and projects: fixed-/rotary-wing, tilt-rotor; sub-/super-/hypersonic - during design, flight test, certification, operations, accident analysis and safety management.

Ivan's current research is focused on virtual test, identification and prevention of irreversible anomalies in the system dynamics, and prototyping of AI safety protection systems for manned/unmanned vehicles and robotic swarms.

Alexander GREBENKIN

Head of Department # 901
Moscow Institute of Electromechanics and Automatics (MIEA) PJSC

Alexander GREBENKIN has 30 years' experience in unsteady aerodynamics, automated flight control, flight dynamics modeling and simulation (M&S). In 1987 Alexander received his PhD degree in Aerodynamics and Flight Operations. In 1993-2011 he worked at Egoryevsk Aviation Technology College. In 2000 Alexander defended his D.Sc. thesis in Automated Flight Control and Flight Operations. In 2001-2011 he worked as Lead Design Engineer (part-time) at Tupolev Aircraft Design Bureau, Stability and Controllability Division. He was in charge for flight M&S to support aircraft certification programs. Since 2011 Alexander works at Moscow Institute of Electromechanics and Automatics as a Head of Department. His research interests in-clude aerodynamics, flight M&S, fly-by-wire systems, synthesis of automatic control algo-rithms.

Marco Kunze

Principal Engineer
CST-Computer Simulation Technology AG

Dr. Marco Kunze is working as a CST Principal Engineer. He is an electrical engineer holding a Ph.D. from TU Berlin and a master's degree from TU Braunschweig in Germany. He worked in research institutes and industry in Germany, France, and China, was an Alcatel-Lucent Technical Academy member and is currently an IEEE senior member. His professional areas of interest include computational electromagnetics (CEM), A&P, EMC, and MTT. He has published over 25 papers, and is inventor of several antenna patents. Dr. Marco Kunze joined CST in 2008, and has over 20 years of experience in applying CEM.

Thierry Thomas

Vice President of Safran Additive Manufacturing
SAFRAN Group

Born in 1962, Thierry Thomas is Associate Professor in Mechanical of the Ecole Normale Supérieure de Cachan and Doctor of Science in Science and Materials Engineering from the Ecole Nationale Supérieure des Mines de Paris. During 14 years at the General Delegation for Armaments, he held various positions that allow him to strengthen its expertise in materials, processes and detonation. Notably, he piloted the UMR-CNRS research DGA UMR114 -The LALP- (laser applications laboratory) and technological field Materials and Processes of the Arcueil Center.

In 2001 he joined Snecma as Director of Materials and Processes and will set up within the group what is now the Materials and Processes Safran Directorate. From 2006, he was in charge of Engineering responsabilities in Safran Landing System up to be appointed in 2011 as Engineering Executive Vice President. In April 2015, Safran Additive Manufacturing has been created and its management has been entrusted. He is a member of the High Committee mechanics of the French Association of Mechanics and member of the Academy of Air and Space. Thierry Thomas has recently been honored by International Institute of Welding in 2017 with the Jaeger price for his contribution to AM development.

Chuanjun LIU

Deputy Chief Engineer
Beijing Aeronautical Science & Technology Research Institute

Deputy chief engineer, BASTRI-COMAC. Chief design of composite wing, a technology readiness wing program of COMAC. Ownership of the EASA stress signature delegation for ATA 55. Lead stress/structure engineer in Airbus Germany for A350XWB VTP and HTP. One of the main authors of Airbus Reference Structural Design Principles for composite structures. Working experience on many Airbus models, including A380, A318 business jet and A350XWB, etc. More than 25years experience on composites and composite structures, expert in structural nonlinear FEM modelling, particularly parametrical modelling, plenty experience in failure prediction, geometrical nonlinearity, contact, etc. Expert in lightning strike protection for composite structures.

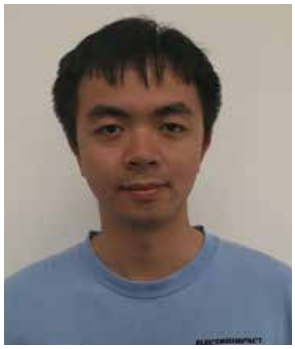
Xiao YE

Composite Engineer
Siemens

Dr. Ye graduated from the Material and Process laboratory of University of Massachusetts, Amherst, USA. His research has been mostly focusing on the interdisciplinary area of mechanical engineering and materials' science. After joining Siemens, he's responsible for the development and support of Siemens integrated composite solution.

Alexander Rajtschan

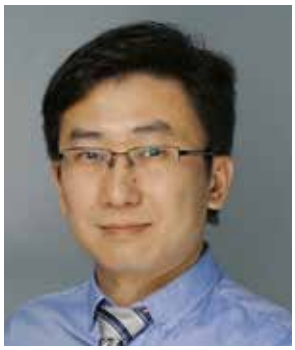
Technical Director / Vice President
Broetje Automation



Heng FAN

Engineering Manager
Electroimpact

Mr. Fan is currently the Engineering Manager for the Electroimpact China office, and a practicing controls engineer. He spent four years working in the US at the Electroimpact Mukilteo office as a controls engineer. Mr. Fan graduated from Sichuan University and has his master's degree from the University of Oklahoma.



Yong CAI

Senior Engineer & Deputy Director
E&E Division, Shanghai Aircraft Airworthiness Certification Center

Cai Yong leads the team of Software and AEH certification in CAAC's different projects. Mr. Cai worked as software engineer for Honeywell and CAAC for 15 years. He set up CAAC's first software certification team and trained all current CAAC's Software/AEH DERs. The Standard Operating Procedures of Software Certification he developed makes C919's nearly 100 software review projects progressed in uniform approach, and improved certification efficiency very much. Other than Software and AEH, Cai Yong is the responsible engineer of CAAC in IMA and Cyber Security Airworthiness Certification. He has received many honors including Honeywell Technical Invention Award and Shanghai "May 1st" Medal.

Frank XIAO

Certification Engineer
Aviage Systems

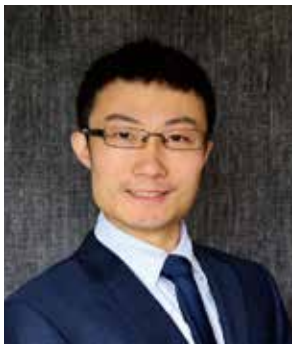
Frank Xiao is a Certification Engineer with AVIAGE SYSTEMS. In this role, Frank is responsible for driving and conducting CTSO/ TSO certification activities for company avionics products, he is the CTSO specialist and coordinator working closely with CAAC to introduce the C153 to China and drive AVIAGE CTSOA projects towards successful authorization. He is also responsible forassurance ofelectronic hardware (DO-254) compliance for AVIAGE Integrated Modular Avionics (IMA) productswhile providing guidance forcorresponding certification regulations with internal/external customers and suppliers including Commercial Aircraft Corporation of China (COMAC)for the C919 program.

Frank began his aviation career at COMACin 2008 he has over seven years of experience in flight training& operations, aircraft performance, airworthiness certification and project management. Frank holds a Master's Degree in Aircraft Design and Engineeringfrom Beijing University of Aeronautics and Astronautics (BUAA), and he is a certifiedProject Management Professional (PMP) by Project Management Institute (PMI).

Jin QIAN

Chief Pilot, COMAC
Director, COMAC Commercial Aircraft Flight Test Center

Qian Jin, COMAC Chief pilot and director of COMAC Commercial Aircraft Flight Test Center, has flown over 20 models including C919, ARJ21-700, B747-4 and B777, accumulating a total flight time of 22000 hours. He has successfully completed the maiden flight of the 10101st aircraft of C919 as a crew member. He has also completed the maiden flight, the test flight ahead of delivery and the RVSM test flight of the 105th and 106th aircraft of ARJ21-700.



Scott KE

Wheels and Brakes System Project Engineering Lead
Honeywell

Scott Ke is the Honeywell Project Engineering Lead of C919 Wheels and Brakes System. He leads the Honeywell engineering team globally for integrating Wheels and Brakes, Tires and Brake Control system with COMAC C919 airplane, holds engineering leadership responsibility for C919 Wheels and Brakes system development, test and certification, and serves as the focal contact between Honeywell and COMAC.

Scott began Honeywell career 8 years ago when C919 project was just kicked off, he were dedicated throughout the C919 project from Joint conceptual development to First Flight. Prior to joining Honeywell, Scott held multiple system engineering and project management positions at MAGNA and SADRI with extensive experience in ARJ21 APU installation kit design, windshield system integration, human factor assessment, requirement based system engineering, and safety assessment. Scott holds a B.S. of propulsion system and energy from Beijing University of Aeronautics and Astronautics (BUAA) and are a certified Project Management Professional (PMP).

John LIU

LEAP-1C Program Director
GE Aviation

John Liu holds the profit and loss (P&L) commercial leadership responsibility for LEAP-1C engine product line for GE Aviation/CFM International. He leads teams of commercial, engineering, quality, supplier chain, and, airworthiness for integrating LEAP-1C integrated propulsion system with COMAC's C919 airplane. John serves as the focal contact between CFMI and COMAC.

John began GE career 15 years ago at GE Global Research Center, New York. He held leadership positions in several GE businesses with extensive experience in research and development, advanced engineering design, service engineering, and project management.

John held Ph.D. degree in mechanical engineering from Rensselaer Polytechnic Institute, Troy, New York, M.S. degree from 3rd Research Academy of Chinese Aerospace Ministry, and B.S degree from Beijing Institute of Aero. and Astro.

Recipient of Forest R. McFarland Award

Vahid Navidi

Chief Engineer's Office Leader
Aviage Systems

Mr. Navidi is Chief Engineer's Office leader for the AVIAGE SYSTEMS. He is responsible for managing the Chief Engineer's Office organization which includes Certification & Airworthiness, Development Quality Assurance, Safety, Reliability, Maintainability and Testability functions. Mr. Navidi has over 28 years of experience in the aerospace business sector managing and leading a variety of highly technical design and development projects for General Aviation and Airtransport customers. He has broad and extensive experience in engineering design & development, Aircraft Certification and Project Management.

Forest R. McFarland Award

This award recognizes individuals for their outstanding contributions toward the work of the SAE Engineering Meetings Board (EMB) in the planning, development, and dissemination of technical information through technical meetings, conferences, and professional development programs or outstanding contributions to the EMB operations in facilitating or enhancing the interchanges of technical information.

Established in 1979, this award is administered by the EMB and honors the late Forest R. McFarland who was himself an outstanding session organizer, a chairman of the Passenger Car Activity and a member of the EMB. Funding for this award is through a bequest by Mr. McFarland to SAE and consists of a framed certificate presented at the SAE World Congress.

This award is presented to Vahid Navidi for outstanding contributions to the work of the SAE Engineering Meetings Board. Vahid has been a part of the International Ad-Hoc Committee (IAHC) – China from its inception (reporting to the ASG Committee) to develop the annual Aviation Technology Forum event held in China. He has been instrumental in securing outstanding speakers for the event for four years. He goes out of his way to participate in the planning calls, even if the time is inconvenient. His knowledge of the China market, along with his ties to the traditional industry sources, makes him an invaluable contributor to the event, every year. There is no doubt that his contributions are the reason the event continues to grow and be successful.

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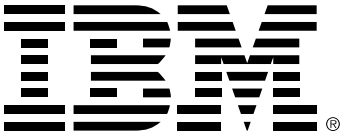

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F

FalconTech

Address: No.99 Hongshan Road, Hongshan, Wuxi New District, Wuxi, Jiangsu. PRC.

www.falcontech.com.cn

Falcontech Co., Ltd. was founded in August 2012, with a registered capital of RMB220 million and headquartered in Wuxi, China, has been rapidly expanding and now houses an office, research and development building and production building totalling 6500 sqm2. Falcontech specialises in the production of metal powder for 3D printing, parts for 3D printing manufacturing, post-processing of parts (including the use of HIP), and a complete solutions consultant of 3D printing information.

Falcontech is equipped with the state-of-the-art R&D and production equipment such as Clean and High Purity ALD EIGA, Renishaw RenAM 500M, EOS M290/M280 and Concept Laser Xline1000R, EPSI Hip Furnace, Zwick/Roell materials Testing Machine, Instron 8801/8802 Servohydraulic Fatigue Testing Machine, Cilas990DL Laser Particle Size Analyser and Horiba O/N/H analyzer. This allows us to consistently meet our customers' needs in quality and providing the latest in goods and service.

Falcontech strives to be at the forefront of global influence in 3D printing provisions by signing a strategic cooperation agreement with Renishaw, the global leader in 3D printing equipment, and becoming the Chinese partner distributor of technical solutions for Renishaw Production (AM) Technology. With years of professional experience in the field of aerospace technology and strategic partners, Falcontech can continue to provide our customers with the most efficient and pioneering manufacturing solutions in the field of 3D printing.

I

IBM

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IBM is a globally integrated technology and consulting company headquartered in Armonk, New York. With operations in more than 170 countries, IBM attracts and retains some of the world's most talented people to change the way the world works, and in so doing to be essential to our clients and to society.

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S

SIEMENS PLM Software

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Siemens PLM Software, a business unit of the Siemens Digital Factory Division, is a leading global provider of product lifecycle management (PLM) and manufacturing operations management (MOM) software, systems and services with over 15 million licensed seats and more than 140,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software works collaboratively with its customers to provide industry software solutions that help companies everywhere achieve a sustainable competitive advantage by making real the innovations that matter.

T

TONGYUAN

Address: Room 1701, E Block, Park of Nano Technology, No.388, Ruoshui Road, Suzhou Industrial Park, Suzhou. PRC.

www.tongyuan.cc

Suzhou Tongyuan Software & Control Technology Co., Ltd is specialized in the platform development and engineering consultation for the design of complex industrial systems based on Modelica. The key product of Suzhou Tongyuan is MWorks, which is a Modelica-based visual modeling and simulation platform for multi-domain engineering systems. MWorks provides visual modeling studio, effective Modelica compiler and symbolic analyzer, powerful postprocessors as well as plentiful industrial model libraries.

Suzhou Tongyuan has offered products and services based on MWorks for a series of national key projects in aerospace industry, such as civil aircraft project including ARJ-21 and C919, lunar exploration project including Chang'e series, manned spacecraft project including Tiangong series, high-thrust carrier rocket including Long March series, etc.

3

3DPRO

Address: Room.111, C Block, eManor Creative Park, No.23, Lane 345, Shilong Road, Xuhui, Shanghai. PRC.

www.3dpro.com.cn

3DPRO(Shanghai)Technology Co. Ltd. is a professional supplier founded in Dec.2006 to offer 3D solution. We are specializing in digital medical, cultural innovation, innovative education and advanced manufacture. 3DPRO is the first domestic listed enterprise in 3D field and was awarded of"Specification & Latest"Enterprise of ShangHai, Shanghai New-high technology corporation. Meanwhile, 3DPRO became the Vice chairman of china's 3D print technologic Industrial Union. In the 3D technological industry, based on the technical strength of Jiao Tong University, 3DPRO invented world-wide advanced 3DPRO scan independently with the advanced 3D application technology.

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Since 1905, SAE has connected automotive, aerospace, and commercial vehicle engineers to each other and the technical resources needed to foster a life time of learning, solutions to improved vehicle technology, and the advancement of the mobility industry.

SAE International's core competencies are life-long learning and voluntary consensus standards development. SAE International's charitable arm is the SAE Foundation, which supports many programs, including A World In Motion® and the Collegiate Design Series.

SAE provides Technical Forum, Professional Development Seminar, Technical Consulting in China, and organizes Chinese delegation to attend SAE global events and exhibitions.

Contact Us:

China Office:

Address: Room 2503, Litong Plaza, 1350 North Sichuan Road,
Hongkou, Shanghai, 200080 P.R. China

Phone: +86-21-6140-8900

Email: chinaoffice@sae.org

Website: www.sae.org.cn (Chinese)
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