



Flying out of Turbulence – Reimagining Defence Aerospace Industry
An Aero Show Eve Virtual Conference Organized by SAEINDIA

1st February 2021

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SAEINDIA Aerospace Forum Activities

Background

SAE has had a long association with aerospace for over a hundred years. Back in 1916, the Society of Automobile Engineers, the American Society of Aeronautic Engineers, the Society of Tractor Engineers and others interested in the growing mobility Industry came together to form the “Society of Automotive Engineers”. The term “Automotive” was intended to represent any form of self- propelled vehicle.

Today, SAE International has a thriving community of members from the Aerospace Industry, and a commanding position in the area of Aerospace Standards with a high percentage of aerospace standards being maintained, managed and disseminated by SAE International through various Aerospace Standards Technical Committees. SAE International also organizes various aerospace specific activities for its members.

SAEINDIA, the largest strategic alliance partner of SAE International, SAEINDIA expanded into Aerospace in 2009 by establishing the Aerospace Board on 17 December 2009. The timing of this expansion was driven by the emerging unprecedented growth in the Aerospace Industry in India.

Aerospace in India

India has had an Aerospace Industry since 1940 when Hindustan Aircraft was created as a private company. Independent India expanded aerospace activities by taking over the management of this company and creating Hindustan Aeronautics Limited, and also establishing several key agencies such as the Defence Research and Development Organization, National Aerospace Laboratories and Indian Space Research Organization. These agencies formed the core of Indian aerospace and were involved in the development and manufacture of aerospace products during the 20th century.

With the advent of the 21st century, and the liberalization of the Indian economy, many private companies are able to operate in the Indian Aerospace Industry and contribute to the global aerospace marketplace. Recent additions include multinational companies (such as Airbus, BAE Systems, Boeing, Dassault, General Electric, Lockheed Martin, SAFRAN and United Technologies Aerospace Systems), private Indian manufacturers (such as Godrej, Larsen & Toubro, Mahindra Aerospace, Tata Advanced Systems Limited, and Tata Automation Limited), as well as engineering service providers (such as Cyient, HCL Technologies, Infosys, Tata Consultancy Services, and Tech Mahindra). The prospect of emerging opportunities in the aerospace sector has also spawned new educational programs at many colleges and universities.

The dramatic growth of the aerospace sector in India is driven by increasing demand on the civil aviation sector, the urgent need for modernization on the defence sector, and policy changes introduced by the Government of India. At the present time, the sun is shining brightly on the civil aviation sector in India. The advent of increasing economic prosperity (indicated by growth in the GDP), and the increasing need for mobility of business personnel has led to a boom in India's civil aviation. Since 2007, many of the airports have been modernized and today India has some of the most modern and efficient world-class airports. The number of airlines and aircraft operating in the Indian skies has also increased significantly, and projections are that this will continue to grow to meet the increasing demand. This, in turn, leads to a greater need for airport services as well as aircraft maintenance, repair and overhaul facilities.

The Defence side of aerospace has also been growing dramatically in India. The Government of India has been pursuing a dual approach to meeting the country's defence equipment needs. While many people talk about the need to develop indigenous products (for India, by India), a more objective analysis shows that producing the variety of complex equipment needed will require substantial upgrades to a broad spectrum of skills and capabilities in different areas such as R&D, engineering, manufacturing, materials, infrastructure, etc.

The Government of India (through the Ministry of Defence) has defined the Defence Acquisition Procedure (DAP) 2020 to simplify the defence procurement procedure and to achieve the objective of self-reliance. There will be no offset clause in government-to-government, single vendor and IGAs. Under the offset clause, foreign companies are required to invest part of their deal value in the country and meant to improve domestic defence manufacturing. Indigenous Content of various categories has been increased by 10%. This has been done to support the Make in India initiative. The recent changes to the Civil Aviation Policy and rules on Foreign Direct Investment also are expected to influence the growth of the aerospace sector significantly.

Each of these avenues (civil aviation, indigenous products, products from MNCs, and policy changes) has led to new set of opportunities for aerospace enthusiasts in India. These opportunities cut across the industry and will have a positive impact on various elements of the Aerospace Industry.

SAEINDIA Aerospace Forum

The Aerospace Forum (previously known as Aerospace Board) of SAEINDIA was created to engage and support this increasing aerospace footprint in India. The Aerospace Forum was officially inaugurated on 17 December 2009, at a simple function in Bangalore, with Dr. Bala Bharadvaj of Boeing as the chairman.

In subsequent months, the Aerospace Forum set about creating a team of dedicated individuals to represent a broad spectrum of the industry, and defining the strategy and direction of this Board. This team defined the overall objective for the Aerospace Board to “Develop a strong community of interest, leading to a healthy aerospace ecosystem in India.” This objective was deliberately chosen to be broad since it was felt that the aerospace story was still unfolding and SAEINDIA should have the flexibility to engage in a wide range of activities. These activities were grouped into the following areas:

- Assist with Education
- Provide opportunities for increasing Knowhow
- Increase access to Standards
- Increase awareness and influence of Policy
- Enable Networking.

These Objectives remain relevant even today, and continue to guide the activities of the Aerospace Forum.

The first event of the Aerospace Forum was held on 26 March 2010 at the National Aerospace Laboratories in Bangalore. It was a highly successful event on multiple counts:

- Brought leaders from DPSUs, Government Labs, Indian industry, and MNCs together on the same platform
- Enabled active exchange of ideas
- Demonstrated the enthusiasm and willingness of the different groups to work together

Over the past decade, many events and activities have been organized by the Aerospace Forum – some independently, but quite a few in collaboration with other like-minded groups. A selected list of these events is listed below:

- “Intelligent Asset Management” by Dr. Richard Greaves, at Bangalore (May 2011)
- “Value Management” by Dr. Edward J Hoffman from NASA, jointly with PMI (2011)
- “National Aerospace Conference & Exposition 2012” at Chennai, with Anna University (Aug 2012)
- “New Vistas of Indian Aerospace & Defense” with Indo-French Chamber of Commerce (Feb 2013)
- “Standards workshop” conducted by SAE International in Bangalore and Hyderabad (June 2012)
- “Propel High with Project Management” conference, jointly with PMI India (July 2014)
- “International Workshop on Integrated Vehicle Health Management for Aerospace Applications” & International Technical Committee meetings for HM-1& E-32 at Bangalore (Oct 2014)
- “Make In India - Transformational Driver for Aerospace & Defense” (July 2015)
- Blue Ribbon CXO Conclave in Bangalore (Sep 2015)
- Celebrating 5th Anniversary of formation of Aerospace Forum (Dec 2015)
- Various events in conjunction with the visit of Board of Directors of SAE International (Jan 2016)
- Contributing to “Skill India” initiative, working with KPMG (May-June 2016)
- Aerospace Then, Now and Future in Feb 2017.

- Systems Engineering for Prognostics and Health Management Systems on 30th May 2018.
- Digital Revolution In Aerospace & Defense Industry on 19th February 2019

As we look ahead, the Aerospace Forum has the potential to contribute to the aerospace ecosystem of India in several different ways. Keeping this in mind, the Aerospace Forum is currently organized into the following focused teams:

- Membership & Recognition
- Academia & Faculty Development
- Professional Development Programs for Industry Members
- Events and Expositions
- Policy Development and External Collaboration

Summary

In summary, the Indian aerospace industry is poised to grow significantly in the years ahead. At the same time, there is need for significant advances in skills and capability at various levels. With many Indian and multi-national organizations located in India, there is a great opportunity for SAEINDIA to engage the aerospace professionals directly and in collaboration with other organizations with similar objectives.

We look forward to greater participation from members, and expand our footprint in aerospace by welcoming new members

SAEINDIA Aerospace Forum Members

Aerospace Forum Chair



Mr. J Munirathnam
Founder CEO
Javaji M Consulting

Aerospace Forum Member



Mr. H.N.Choudhury

Aerospace Forum Member



Mr. Ravishankar Mysore
Former Vice President-Engineering
Global Engineering Center-India

Aerospace Forum Member



Shri Yellamanchali Sreenivas Rao
Scientist 'G' and core Project Director
of Ballistic Missile Defence System
DRDO

Aerospace Forum Past Chairman



Dr. Bala Bharadvaj
Former Managing Director
Boeing India Engineering
& Technology Center

Aerospace Forum Member



Mr. M. Parvez Alam
CEO, Crescent Innovation &
Incubation Centre (CIIC)

Aerospace Forum Member



Mr. D. Uma Maheshwar
Executive Chief Consulting Engineer
GE Aviation-India

Aerospace Forum Member



Dr. S. Senthilkumar
Associate Professor
SRM Institute of Science and
Technology

Aerospace Forum Member



Mr. Damodaran Subramanian
Former Managing Director
SAFRAN Engineering Services India

Aerospace Forum Member



Mr. Ravindra Nuguri
Former CEO, Centum Adeneo India

Aerospace Forum Member



Mr. Vasanth Kini
Managing Director
Titanium Industries India Pvt Ltd

AeroCON 2020 Steering Committee Members



Patron
Mr. A S Kiran Kumar
Former Chairman, ISRO



Chair
Mr. Damodaran Subramanian
Managing Director, SAFRAN Engineering Services, India



Co-Chair
Dr. Bala Bharadvaj
Managing Director, Boeing India Engineering and Technology Center



Co-Chair
Mrs. Rashmi Urdhwarshhe
Former Director, ARAI



Member
Dr. Ravi Rajamani
FSAE, FIMechE, Independent Consultant and Research Professor, University of Connecticut



Member
Mr. Ashok Verghese
Director, Hindustan University



Member
Mr. Luigi Celmi
CEO, Lufthansa Technik Services India



Member
Mr. Savyasachi Srinivas
Executive Director, Engineering Collins Aerospace



Member
Gp. Captain Ajit Keshav Agtey
Formerly IAF



Member
Mr. Kap Prabhakaran
HTS India Aerospace Leader, Honeywell Technology Services



Member
Mr. Ravikiran Pothukuchi
Director, Aerospace, Defense, Marine & Offshore, Dassault Systemes



Member
Mr. Nitesh Bansal
SVP & Global Head of Engineering, Infosys



Member
Dr. Jitendra J Jadhav
Director, NAL



Member
Mr. Sathish Menon
Vice President, Thales



Member
Mr. Murli Iyer
Executive Global Advisor, SAE International



Member
Dr. Manasvi Maharana
Head of Engineering, Bombardier



Member
Mr. Shyam Karigiri
Managing Director, Moog India



Member
Mr. Lalan Singh
Regional Technical Manager, Ansys Inc.

AeroCON 2020 Organizing Committee Members



Chair, Organizing Committee
Mr. Muniratham Javaji
Founder & CEO, Javaji Consulting



Co-Chair, Organizing Committee
Mr. D. Umamaheshwar
Executive Chief Consulting Engineer, GE



Co-Chair, Organizing Committee
Mr. N. Shekar
President, AIDAT



Chair, Industry Interface Committee
Mr. Vasant Kini
Managing Director, Titanium Industries



Chair, Industry Interface Committee
Dr. Y. Srinivasarao
Scientist, ICI Labs



Chair, Finance Committee
Mr. M. Kannan
Manager R&D, TVS Motors



Co-Chair, Finance Committee
Mr. Rakesh Bidre
CAE Leader - Safety, GM TCS



Chair, Technical Committee
Dr. G V V Ravikumar
Associate Vice President & Head Advanced Engineering Group, Infosys



Co-Chair, Technical Committee
Dr. Ramakrishnan Raman
Principal Systems Engineer, Honeywell



Chair, Event Marketing Committee
Mr. Pervez Alam
CEO, Crescent Innovation Incubation Council



Co-Chair, Event Marketing Committee
Mr. Krupal Aerpula
Engineering Leader, Boeing India Pvt. Ltd



Chair, Media & Communications Committee
Mr. Prasad M P
President, Agnito Insights



Member, Industry Interface Committee
Mr. Ravishankar Mysore
Formerly, Collins Aerospace



Member, Industry Interface Committee
Mr. Dinesh Manoharan
Manager, Aerospace & Defense, UCAL



Member, Technical Committee
Dr. Ganga Reddy
A&D Mechanical Delivery Head, HCL



Member, Technical Committee
Mr. Nanda Kumar Maslekar
Consultant, SASMOS HET Technologies Ltd



Member, Technical Committee
Mr. Sathish Thokala
AeroDef & Space Industry Manager, MathWorks



Member, Technical Committee
Dr. S. Senthil Kumar
Associate Professor, SRM University



Member, Technical Committee
Prof. C.S. Karunakaran
Assistant Professor, Hindustan Institute of Technology and Science



Member, Technical Committee
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Electrical Design Analysis Engineer, Boeing



Member, Organizing Committee
Mr. Sandeep Birje
Specialist Engineer - Aerospace, Eaton



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Mr. Robin Jacob
Senior Lead Engineer, Collins Aerospace



SAEINDIA HQ Team
Mr. K. Venkataraj
DDG, SAEINDIA



SAEINDIA HQ Team
Mr. D. Seshadri
ED, SAEINDIA



Member, Event Management Committee
Mr. Akash Pandey
Student

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If you've ever seen a rocket launch, flown on an airplane, driven a car, used a computer, touched a mobile device, crossed a bridge or put on wearable technology, chances are you've used a product where Ansys software played a critical role in its creation. Ansys is the global leader in engineering simulation. Through our strategy of Pervasive Engineering Simulation, we help the world's most innovative companies deliver radically better products to their customers. By offering the best and broadest portfolio of engineering simulation software, we help them solve the most complex design challenges and create products limited only by imagination. Founded in 1970, Ansys is headquartered south of Pittsburgh, Pennsylvania, U.S.A. Visit www.ansys.com for more information.



Hexagon is a global leader in sensor, software and autonomous solutions committed to a simple, yet powerful purpose: Putting data to work to empower an autonomous future.

In this future we're empowering, data is doing its greatest work — leveraged to achieve its full potential. It's a world where our customers possess the means to flourish, the room to grow, and the data-driven efficiencies, productivity, and quality outcomes to ensure that both humanity and sustainability thrive.

The idea of putting data to work is part of Hexagon's DNA. Our legacy has always been linked to data.

We emerged as a leader in **sensor solutions** nearly 20 years ago, which enabled the digital capture and positioning of the physical world.

We added **software solutions** to not only unlock the value of sensor data but also offer the ability to design and simulate and provide location intelligence of real-world scenarios.

And today, we're combining things like machine learning and AI with our sensor and software leadership to create powerful **autonomous solutions**.

Our strategic advantage: The Smart Digital Reality™

Hexagon is unique in our breadth and depth of sensor, software and autonomous technologies. When these core capabilities converge, their collective value increases exponentially. The result is a Smart Digital Reality™, which is what we aim to deliver with every solution we provide. It is our strategic advantage and the greatest source of value for our customers.

A Smart Digital Reality™ is a digital replica of a complete physical world, where all associated things, places and processes within it are machine-readable and subject to the power of algorithms. Every Smart Digital Reality has three defining characteristics:

- **Digitally accessible:** Provides seamless access to physical world information in a digital world
- **Infinitely connected:** Draws and acts on data from multiple sources simultaneously
- **Autonomously intelligent:** Leverages data to make unaided decisions and becomes smarter over time

Smart Digital Realities have the power to understand what was and what is, and to see what could be, what should be and what will be. With the ability to draw and act on data from multiple sources simultaneously, make unaided decisions, and become smarter over time, they can provide the ultimate form of data leverage.

Leading a new revolution

We are on the cusp of a revolution from automation to autonomy, a revolution that will finally put all data to work. Machines with only fixed, automated functions today will be capable of dealing with changing, real-world situations — intelligently and autonomously. Autonomy will be introduced to tasks, work processes, entire operations and industries. Smart, ecosystem-wide solutions will dwarf the impact of recent disruptions like the Internet of Things and big data.

Armed with our core capabilities and strategic advantage, this is the revolution Hexagon is leading.

Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous — ensuring a scalable, sustainable future.

Hexagon's Manufacturing Intelligence division provides solutions that utilise data from design and engineering, production and metrology to make manufacturing smarter. For more information, visit hexagonmi.com.

Learn more about Hexagon (Nasdaq Stockholm: HEXA B) at hexagon.com and follow us [@HexagonAB](https://twitter.com/HexagonAB).



We are ALTAIR

Solving your toughest challenges. Helping the innovators innovate, drive better decisions, and turning today’s problems into tomorrow’s opportunities.

Our Solutions -

Data Analytics – With the help of AI and machine learning, Altair turns difficult data into smart data, leading to actionable insights that help you solve your toughest challenges.

Simulation – Use Altair's simulation technology to improve development efficiency, optimize product performance, and accelerate growth. Our simulation-driven approach to innovation is powered by our integrated suite of software which optimizes design performance across multiple disciplines encompassing structures, motion, fluids, thermal management, electromagnetics, system modeling and embedded systems, while also providing data analytics and true-to-life visualization and rendering. As a leading provider of enterprise-class engineering software enabling innovation, we deliver reduced development times and lower costs throughout the entire product lifecycle from concept design to in-service operation.

High – Performance Computing – Whether onsite or in the cloud, Altair's HPC solution accelerates your engineering and design workload especially compute-intensive tasks like solvers, optimization, modelling, visualization, and analytics.

Altair Solutions areas and Industries:

TRENDS

- Additive Manufacturing
- Autonomous & ADAS
- Big Data
- Cloud Computing
- Data Transformation
- Digital Twin
- e-Mobility
- Exascale
- GPU Solutions
- Lightweighting
- Machine Learning
- Manufacturing Analytics
- Mechatronics
- Smart Product Development
- 5G

INDUSTRIES

- Aerospace
- Agriculture & Construction
- Automotive
- Civil Engineering
- Consumer Goods
- Electronics
- Energy
- Financial Services
- Government Agencies
- Healthcare
- Marine
- Process Manufacturing
- Rail
- Insurance
- Telecommunications
- Weather & Climate

ROLES

- Data Scientists & Analysts
- Designers
- Developers
- Engineers
- Executives
- Facility Managers
- IT & HPC Professionals
- Start-ups
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Expanded Options. Faster Results. Better Products: The Altair Partner Alliance (APA) delivers broader access to an extended range of software solutions, using your existing Altair Units at no additional cost. Third-party software companies in the APA include technologies ranging from computational fluid dynamics and fatigue, to manufacturing process simulation and human modeling, with applications specific to industry-verticals including marine, motorcycles, aerospace, chemicals, and architecture.

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(expleo)

About Expleo Group

Expleo Group is a trusted partner for end-to-end, integrated engineering, quality services and management consulting for digital transformation. We help businesses harness unrelenting technological change to successfully deliver innovations that will help them gain a competitive advantage and improve the everyday lives of people around the globe.

Expleo Group is focused on providing world-class engineering and technology solutions to the Aerospace & Défense, Automotive, Transportation and Industrial sectors. Expleo Group employs more than 15,000 engineers across 30 different countries. Expleo is a key partner to some of the world's largest industrial groups namely Airbus, Safran, Thales, IAI, Siemens, MTU, Bombardier, Alstom, Fiat Chrysler, Renault, Volkswagen, Schneider Electric and others.

Expleo in India is in 3 different locations, namely Pune, Chennai and Bangalore, with a combined team strength of more than 2400 engineers. Expleo in India is serving the Industry for more than 35 years in Engineering, Manufacturing services and as well as in software development and QA services for aerospace, automotive, Transportation, Enterprise, PLM and BFSI sectors. In this journey of solutions to the industry, we have served more than 100 delighted customers for various project requirements.

For more information please visit: www.expleogroup.com

MOOG

Moog is a global designer, manufacturer and integrator of precision motion control products and systems, and is a world leader in flight control systems and critical component control applications. Moog has been in India for more than two decades, and Moog India Technology Center (MITC) in Bangalore established in 2009 includes a staff of 200+ employees providing engineering, design, test and certification support for mission critical aerospace and defense systems.



Moog India Technology Center, Bangalore

MITC Provides Software, Electronics, Mechanical Design, Test Equipment Support and Qualification Testing for Commercial & Business Jets



Moog provided lateral control electronics (LCE) for Boeing 747-8, Level A software for flight control systems on the Gulfstream G280/G650 business jets, system analysis and independent verification and validation (IV&V) to support the overall system certification. MITC was also engaged in supporting Boeing B787-9, Airbus A350-900, A350-1000, Embraer E190/E175, COMAC C919, Gulfstream G500/G600/G650 aircraft programs in mechanical detailed design and electronics system design activities. Moog is also supporting expansion of MRO facilities for Wide Body Commercial Aircraft ATA Chapter 27 LRUs in Middle East & Asia Pacific regions.



Boeing 787-9 Test Rigs

Design of Moog Components for Commercial and Business Jets



Hydraulic Flight Control Actuator & Additive Manufactured Manifold

MITC team extensively supports design and analysis of commercial flight control actuation system hardware consisting of primary flight surfaces on the airplane, as well as the spoilers and horizontal stabilizer, and includes a mix of electrohydraulic (EH) and electromechanical (EM) servoactuators and all associated control electronics. The team also supports design and realization of 3D printed prototype manifolds and actuators using Additive Manufacturing Technology. Presently, extensive testing, process certification of these products is in progress.

System Level Testing



COMAC C919 Iron Wing Test Rig

Over the years, Moog has grown from a high technology component manufacturer to become a leading supplier of integrated flight control systems. COMAC C919 Iron Wing is fully commissioned and System Level Hardware/Software testing is being carried out at our facility. We are positioned today on virtually every aircraft in the marketplace, supplying reliable flight control systems and specialized control products that are highly supportable and add significant value for our customers.

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Flying out of Turbulence ... Reimagining Defence Aerospace Industry

SAEINDIA Aerospace Forum, since its inception in 2009, has been in the forefront in engaging with both Defence and Commercial Aerospace Industry. AeroCON 2020, the international conference held recently was a highly successful event where over 500 delegates from Industry, academia and research laboratories actively participated in the event. It featured multiple plenary sessions and panel discussions on the various challenges and opportunities for the aerospace industry in the prevailing pandemic era.

India is an emerging high valued hub of Global Aerospace Industry with its state of art facilities, skills in disruptive technologies, engineering R&D centers, laboratories and modern manufacturing facilities. India's Aerospace Industry is one of the fastest growing in the world. While globally the Aerospace and Defence Industry has been rapidly advancing with new technologies and artificial intelligence, the Indian Government is also actively promoting indigenisation with cutting-edge technologies being adopted and manufactured in the country under Make in India and Atmanirbhar Bharat.

In conjunction with the globally acclaimed Aero India show, SAEINDIA Aerospace Forum is organizing a one-day event to provide a forum for the aerospace community to discuss and debate on the business and technology imperatives. In continuing this series, towards the upcoming Aero India 2021, SAEINDIA Aerospace Forum is organizing the one-day event titled **"Flying out of Turbulence - Reimagining Defence Aerospace Industry"** will be held on 1st Feb 2021. Due to current pandemic, this event is planned to be virtual from 2.00pm to 6.00pm IST. The conference is planned to have two tracks, each consisting of a Keynote address and Panel discussion as outlined below:

Track: Commercial and Fighter Aircrafts

- Keynote Address 1 – Indian Defence Aircraft Programs Current Status & Way forward
- Keynote Address 2 – Indian Commercial Aircraft Programs Current Status & Way forward
- Panel Discussion 1 – Challenges & Opportunities for industry to support Indian Aircraft Programs

Track: Drones & Airborne Systems

- Keynote Address 3 – Airborne Systems in India Current Status & Way forward
- Panel Discussion 2 - Challenges and Opportunities for industry to support Indian Drones

The keynote address will be delivered by an expert aligning to the overall theme. The panel discussion will have one moderator and five panel members. The panel discussion is aimed at bringing multiple perspectives from each of the panel member sharing the learnings and best practices driving towards key takeaways for the session.

This program will be congregation of Think Tanks, Policy Makers and Captains and Leaders of Defence Aerospace Industry from both India and abroad.

The event provides:

- A forum for strategic discussion creating an interactive environment for effective brainstorming
- A Platform to foster honest debate on the current scenario in the Industry.
- Aims to create the road map for the Future of Defence Aerospace Industry.

Event Agenda

Time	Duration	Agenda
2:00 – 2:05 PM	5mins	Invocation
2:05 – 2:15 PM	10 mins	Welcome Address (by SAEINDIA Aerospace Forum Chair)
2:15 – 2:40 PM	25 mins	Inaugural Address
Track: Commercial and Fighter Aircrafts		
2:40 – 3:05 PM	25 mins	Keynote Address 1 – Indian Defence Aircraft Programs Current Status & Way forward
3:05 – 3:30 PM	25 mins	Keynote Address 2 – Indian Commercial Aircraft Programs Current Status & Way forward
3:30 – 4:30 PM	60 mins	Panel Discussion 1 – Challenges and Opportunities for industry to support Indian Aircraft Programs
10 mins Break		
4:40 – 4:50 PM	10 mins	Special Address - Advances in digital technologies for aerospace industry
Track: Drones & Airborne Systems		
4:50 - 5:15 PM	25 mins	Keynote Address 3 – Airborne Systems in India Current Status & Way forward
5:15 - 6:15 PM	60mins	Panel Discussion 2 - Challenges and Opportunities for industry to support Indian Drones
6:15 – 6:30 PM	15 mins	Valedictory & Concluding Session

Inaugural Address



Dr. Tessy Thomas,

Distinguished Scientist,

Director General (Aeronautical Systems) obtained her B.Tech in Electrical Engineering from Govt.Engineering College, Trichur (Calicut University) in 1985 and ME in Guided Missiles from Institute of Armament Technology (now Defence Institute of Advanced Technology), Pune in 1986 and PhD in Missile Guidance from Jawaharlal Nehru Technological University (JNTU), Hyderabad in 2014. She obtained MBA in Operations Management from Indira Gandhi National Open University (IGNOU), New Delhi, in 2007.

Dr. Tessy Thomas Joined IAT, Pune as a faculty member in Guided Missiles in the year 1986. She joined DRDL,Hyderabad in 1988. She was associated with Agni Programme right from its developmental flights. She has **designed the guidance scheme for long range missile systems which is used in all Agni missiles**. An energy management guidance scheme was designed and developed for the first time in the country for an all – solid propelled long range systems for which she was conferred with **Agni self reliance award in the year 2001**.

In her work spanning more than 33 years, she has contributed in various fields such as Guidance, Control, Inertial Navigation, Trajectory Simulation and Mission Design. She lead a major project **AGNI-4** as **Project Director**, for a state-of-art system with many new technologies for the first time and successfully flight tested and proven and was also **Project Director (Mission)** for the long range **AGNI-5system** and successfully flight tested and proven. As **Director, Advanced Systems Laboratory**, DRDO, she held multi-dimensional roles and responsibilities and lead the development of strategic missile system. **Presently, leading the Aeronautical Systems Cluster Laboratories as Director General** with the responsibility of design and development of state-of-the-art-UAV's, Manned and Unmanned Aircrafts, Aero Gas Turbine engine technology, Air borne surveillance systems, technologies and systems related to parachute and lighter-than-air systems for the Armed forces.

Dr. Tessy Thomas is the recipient of many prestigious awards including: DRDO Agni Award for Excellence in Self-Reliance – 2001; DRDO Award for Path breaking Research/Outstanding Technology Development-2007; DRDO Scientist of the Year Award-2008; DRDO Performance Excellence Award for Agni 4 in 2011; DRDO Performance Excellence Award for

Agni 5 in 2012; Lal Bahadur Shastri National Award for Excellence in Public Administration Academics and Management-2012; Suman Sharma Award by The Institution of Engineers (India), National Design and Research Forum for Engineering Design in 2009; Madam Marie Curie Mahila Vijnana Puraskar-2012; India Today Woman of the Year Award-2009; CNN-IBN Indian of the Year Award-2012; Outstanding Woman Award by National Commission for Women -2013; Vanita Ratnam Puraskaram – 2014 by Government of Kerala, Department of Social Justice, “Bharat Ratna Sir Mokshagundam Visvesvaraya Award-2016” by The Institution of Engineers (India), Telangana State, “Distinguished Woman Scientist Award” in 2016 by Andhra Pradesh Science Congress, Andhra Pradesh Academy of Sciences. “Outstanding Woman Achiever” award in the field of Science and Technology by Women in Science and Engineering (WISE), India. “Missile Bhushan Samman” by Vigyan Parishad Prayag, Jodhpur in Nov 2019.

She is Fellow of Indian National Academy of Engineering (FNAE), Fellow of Andhra Pradesh Akademi of Sciences (FAPAS), Fellow of Institution of Engineers India (FIE), Fellow of Aeronautical Society of India (AeSI), Vice President of Astronautical Society of India (ASI), Life Member of Indian National Society for Aerospace & Related Mechanisms (INSARM), Life Member of Indian Society for Advancement of Materials and Process Engineering (ISAMPE), Life Member of Society for Aerospace Quality and Reliability (SAQR).

Honoris Causa: -

1. Doctor of Literature (Honoris Causa) from Symbiosis International (Deemed University), Pune in 2019
2. Doctor of Science (Honoris Causa) from IIT, Kanpur in 2019.
3. Doctor of Science (Honoris Causa) from Central University of Karnataka, Kalaburagi in 2018.
4. Doctor of Science (Honoris Causa) from Dr. Bhimrao Ambedkar University, Agra in 2017.
5. Doctor of Literature (Honoris Causa) from ITM University, Gwalior in 2016.
6. Doctor of Science (Honoris Causa) from Sri Padmavati Mahila Vishwavidyalaya University, Tirupathi in 2015.
7. Doctor of Science (Honoris Causa) from Hindustan University, Chennai in 2014
8. Doctor of Science (Honoris Causa) from Mangalayatan University, Aligarh in 2012.
9. Doctor of Science (Honoris Causa) in Space Science from Kalyani University, West Bengal in 2012.

Track: Commercial and Fighter Aircrafts

Keynote Address 1 : Indian Defence Aircraft Programs Current Status & Way forward

Objectives:

This Keynote address provides a perspective on fighter aircraft programs in India current status and way forward.

It addresses key aspects outlined below:

- Current opportunities for industry to support Indian fighter aircraft programs
- What are the current challenges?
- What industry needs to do in terms of building competency and capability?
- What partnerships needs to be built?
- What are the best practices and key learnings?
- Support required from government and professional bodies
- Skills & Training requirements



Keynote Speaker

**Dr. Girish Shantaram
Deodhare**

Distinguished Scientist,
Program Director(Combat
Aircraft) & Director, ADA

Dr. Girish Deodhare is distinguished scientist, program Director (Combat Aircraft) & Director Aeronautical Development Agency in Bangalore. He graduated with B.Tech. degree in Electrical Engineering and M.Tech. Degree in Control and Instrumentation, from IIT Bombay in 1984 and 1986 respectively. He earned his PhD in Control Theory from the University of Waterloo in Canada, in 1990. He started his career in DRDO as Scientist in Centre for AI and Robotics (CAIR), Bangalore. Later joined the Aeronautical Development Agency. He led the National Control Law (CLAW) team for LCA. He is involved in the design and development of flight control systems for the Indian Light Combat Aircraft using both classical and modern control synthesis techniques.

Awards and Honours

- Distinguished Alumnus Award", IIT Bombay, 2016.
- DRDO Award for Performance Excellence, 2013
- National Aeronautical Prize awarded by Aeronautical Society of India for contributions to "FBW Control Law for LCA", 2002
- Technology Shield from National Aerospace Laboratories for Outstanding Achievement in LCA CLAW Design, Certification and Successful Flight Test", 2001
- Marconi International Fellowship's "Young Scientist Award" for the year 1996
- INAE "Young Engineers Award" for the year 1996
- DRDO Technological Award" for the year 1994

Publications

More than 40 publications in peer reviewed International Journals and Conferences

Keynote Address 2 : Indian commercial aircraft programs current status and way forward

Objectives:

This Keynote address to provide a perspective on Indian commercial aircraft programs current status and way forward

- Current opportunities for industry to support Indian commercial aircraft programs
- What are the current challenges?
- What industry needs to do in terms of building competency and capability?
- What partnerships needs to be built?
- What are the best practices and key learnings?
- Support required from government and professional bodies
- Skills & Training requirements



Keynote Speaker

Jitendra J. Jadhav

Director, National
Aerospace Laboratories

D Shri Jitendra J. Jadhav is the director of CSIR-National Aerospace Laboratories, Bangalore. He obtained his BE(Electronics) from university of Pune in 1987 and MS from Computer Engineering Department of the Defence institute of advanced technology (DIAT), Pune. He has more than 29 years of experience in design and development of military systems of Army, Navy, Airforce, Industrial and Railway applications. He has designed, developed and commercialized major systems like Fire control systems for tanks, Airborne digital optronic pedestal for Nishant, Optical fire control systems for Navy, Mission and Display computer and weapon control system for LCA-Tejas. Tactical Mission system for Helicopter and digital servo systems for automobiles and railways. Prior to taking over charge as Director, NAL he worked as outstanding scientist, project director, LCA (AF Mk1) & Group Director(weapon and missile system) at ADA Bangalore and was instrumental in steering the initial operational clearance of LCA and induction into services. Under the able leadership of Jadhav as Director of CSIR-NAL, the laboratory is making important contributions towards furthering the Make in India" National mission of the government of India spread across both civil and military aeronautics/aviation sectors in addition to the strategic, space, automotive and societal sector programs.

Shri Jadhav has won many awards and laurels for his significant contributions from ADA and DRDO etc. He has published more than 20 papers in National and International journals of repute. During his short tenure at CSIR-NAL, the laboratory has received the technology innovation award 2016 and technofest award 2016.

Panel Discussion 1: Challenges and Opportunities for Industry to support Indian Aircraft Programs

Objectives:

This panel deliberates on the challenges and opportunities for Industry to support Indian Aircraft programs. It focuses on

- Current opportunities for industry to support Indian aircraft programs
- What are the current challenges?
- What industry needs to do in terms of building competency and capability?
- What partnerships needs to be built?
- What are the best practices and key learnings?
- Support required from government and professional bodies
- Skills & Training requirements

The panel discussion will also provide a roadmap and message to the aerospace community in post COVID Era



Panel Moderator Dr. Kota Harinarayana

Former Program Director,
LCA- Tejas

Dr. Kota Harinarayana graduated from BHU in Mechanical Engineering, postgraduate in Aero Engineering at IISc, Bangalore, Ph.D. at IIT Bombay and holds a bachelor's degree in law. As Programme Director and Chief Designer of Light Combat Aircraft, he successfully directed the project leading to flight testing and clearance for limited series production. Thanks to his efforts, India succeeded in developing a state-of-art, high technology fighter aircraft of world class. He is the Fellow of Aeronautical Society of India (former President of the Society), National academy of sciences and Indian National Academy of Engineering. He received distinguished alumnus award from Indian Institute of Science and from IIT Bombay . He was awarded National Aeronautics Prize and FIE Foundation Award. He received SBI-Pragna Puraskar, received the Dr. Y. Nayudamma Memorial Award. He received the DRDO Technology Leadership Award and was honoured with Padma Shri by Government of India in 2002. Indian National Academy of Engineering conferred up on him, the life time contribution award in engineering, for the year 2006. He was formerly Vice-Chancellor of University of Hyderabad, 2005, Chairman, Research council, Centre for wind energy technology, Chennai, Distinguished Guest Professor, Department of Aerospace Engineering, IIT-Bombay, Indian Technical coordinator for India-Trento/Italy S&T program, Pratt & Whitney Chair professor at Univ of Hyderabad; Dr D S Kothari, DRDO Chair at ADA, Bangalore.



Panel Member 1
K. Jayaraman

President, Rolls Royce India &
South Asia

Kishore Jayaraman is President for Rolls-Royce India and South Asia. Since taking over the role eight years ago, Kishore has been instrumental in driving strategic focus and significant expansion across the Rolls-Royce Defence, Civil Aerospace and Power Systems businesses. Prior to joining Rolls-Royce, Kishore held diverse leadership roles across markets at GE for 23 years, and his last assignment was as President and CEO of GE Energy, South Asia. With an MS in Mechanical Engineering and an MBA, Kishore serves on several boards and is at the helm of industry committees and associations, whilst being a champion for leadership development and strategic ecosystem evolution for the present and future. Kishore is based in New Delhi, India



Panel Member 2 Tejaswi
Narasimhan

Director Sales, India&SE Boeing

Tejaswi (Tej) is director sales, Boeing Commercial Airplanes as the senior in-country executive leading sales engagement for airline customers, Air India, Air India Express, Vistara and SpiceJet. Tej has been with Boeing for over 11 years and has held various positions in Customer & Tech Support, Strategy & Business Development and Sales & Marketing. Tej is also qualified to certify multiple Boeing airplane models. Prior to Boeing, Tej spent 10 years as an Aircraft Engineer with Cathay Pacific, Saudi Arabian Airlines and Air France. Tej holds an M.B.A. from the Warwick Business School at the University of Warwick (United Kingdom) and is a Bachelor of Science graduate in Aircraft Maintenance Engineering. Tej lives in Delhi, India with his family. His favorite pastimes include travel, music, networking and watching motorsports. Tej was a sprinter for his school and university.



Panel Member 3 Satish Sastry
Director, Collins Aerospace

Satish Sastry has over 22+ years of experience in Avionics industry. Originally from Bangalore, he holds a Degree in Electronics & Communication and also a Post Graduate Diploma in Business Management from the Indian Institute of Management (IIM), Bangalore.

Satish joined Collins Aerospace in 2008 from Honeywell when Collins started its India Design Center (IDC) at Hyderabad and was one among the initial Leaders who played a key role in establishing the IDC as a Center for technology and Innovation to support global businesses. He currently leads the Military & Commercial Avionics Engineering portfolios for India and supports Business Development activities in the APAC region. Satish is also the site lead for Hyderabad facility.

Satish represents Collins Aerospace in NASSCOM Hyderabad & AMCHAM Hyderabad chapters. He is very passionate about technology and innovation is part of various subcommittee to promote STEM in NASSCOM, Hyderabad.



Panel Member 4
Mantha V.
CEO, Expleo Technologies

Presently, working as Chief Executive Officer at Expleo Technologies India Pvt Ltd taking care of the two delivery centres in Bangalore and Chennai comprising of about 400 engineers. The major aerospace engineering projects being delivered from India operations are related to structural design and analysis, avionics development and Systems Integration. Possesses more than 33 years of experience in Aerospace engineering domain. Brings in strategic direction and change leadership through his diversified experience. He has been an active Flight Test Engineer on fixed wing aircraft with Indian Air Force during the first 18 years of his career. Successfully completed many system engineering projects. One of them is running an offshore development center with a team size of 400 engineers for more than 3 years performing high-end design and analysis of aero structures of a complete transport aircraft. Product design activities comprised of concept to design, full life cycle software development programs including DO 178 and DO 254 Certification, manufacturing engineering support and sustenance engineering activities. At HCL Technologies as a Business Unit Head, Mantha transformed the complete Engineering services portfolio with Aero structures design to be the most differentiating practice and built a 375 engineer team from scratch and doubled the net margin through accelerated innovation, enabling co-creation across employees, clients and the larger aerospace ecosystem. His previous other roles include senior management positions

as Business Head, aerospace Engineering services with QuEST Global where he developed new service lines in Aerospace, Defense and Automotive sectors through conceiving a transformational relationship model with clients. He also had been the Senior Vice President at AXISCADES (prior to joining Expleo Technologies India) where he was responsible for building some of the strategic OEM relationships in Aerospace and Automotive domain.



Panel Member 5
D. Krishna Mohan
Director, Moog India
Technolog

Mr. Mohan is a graduate in Mechanical Engineering and master's in aerospace systems engineering. After completing graduation in 1992, Mr. Mohan joined TISCO, Jamshedpur and served the organization as Systems Analyst in CAD/CAM section. Later he joined Aeronautical Development Agency (ADA), Bangalore as Scientist/Engineer. In his design engineer role, he successfully executed design & development of hydraulic system components. Mr. Mohan gained the knowledge in aircraft flight control systems and contributed immensely for indigenous development of flight critical hydraulic actuation systems for LCA.

In 2008, Mr. Mohan joined Moog India Technology Center (MITC), Bangalore as head of Design Department. As part of leadership team, he took ownership to build capable Design, Stress, Product Engineering teams at MITC. With focus on "Done right, first time, on time, every time" along with established SMART goals his team could successfully execute engineering support activities for 787, A350 commercial aircraft programs. Under his leadership, MITC team could successfully establish world class Qualification Test Lab meeting DO 160 standards & FAA guidelines. His team successfully completed qualification tests on 787, A350, E910 flight hardware and currently few test programs are still in progress at the facility.

Mr. Mohan served MITC organization in the role of Deputy Site Director. Currently he is responsible for Commercial Aircraft Business Development and Customer Support activities in Middle East, Africa & India regions. He is actively involved in establishing Moog MRO facilities in these regions in collaboration with regional airlines.

Special Address : Advances in digital technologies for aerospace industry



Mr. Amit Agarwal

Director Technical – India,
ASEAN and ANZ

Ansys

Amit Agarwal leads the technical team of Ansys India, serving customers across India, ASEAN and ANZ.

He works closely with strategic customers across industries and has led many crucial campaigns for Ansys India including ones on customer retention, new and emerging products and the global campaigns on customer success stories and industry best practices. He has also initiated successful campaigns on academic relationships and key account development.

In his earlier role, Amit was instrumental in developing an industry focused sales and technical team at Fluent India serving India and South East Asia. He has worked closely with key academia, private and government organization and multinational design centres across industries in India.

With B. Tech., Aerospace Engineer from I.I.T. Bombay, Amit has been with Ansys for 24 years, having started his career with the former Fluent organization.

Track: Drones & Airborne Systems

Keynote Address 3 : Airborne Systems in India Current Status & Way forward

Objectives:

This Keynote address to provide a perspective on Indian commercial aircraft programs current status and way forward

- Current opportunities for industry to support Indian commercial aircraft programs
- What are the current challenges?
- What industry needs to do in terms of building competency and capability?
- What partnerships needs to be built?
- What are the best practices and key learnings?
- Support required from government and professional bodies
- Skills & Training requirements



Keynote Speaker

Pawan Kumar Chandana is Co-Founder & CEO of Skyroot Aerospace which is a National-Award winning Space Startup developing one of India's first privately built Space Launch Vehicles. He is a former scientist of ISRO and one of the few Indians named in Forbes 30-Under-30 Asia 2020.

Pawan Kumar Chandana

Co-Founder & CEO of
Skyroot Aerospace

Panel Discussion 2: Challenges and Opportunities for industry to support Indian Drones

Objectives:

This panel deliberates on the challenges and opportunities for Industry to support Indian Drones and Airborne Systems programs/initiatives. It focuses on

- Current opportunities for industry to support Indian programs in Drones and Airborne Systems
- What are the current challenges?
- What industry needs to do in terms of building competency and capability?
- What partnerships needs to be built?
- What are the best practices and key learnings?
- Support required from government and professional bodies
- Skills & Training requirements



Panel Moderator

Dr. Padmanabhan

CEO, UCAL

Dr. M. K. Padmanabhan is a Technocrat with more than 35 years of experience in domains that span Enterprise creation and Management, Education and Applied Research, Governance and Policy implementation.

Presently, from 2016, he is the Director of Virginia Tech India Center for Research and Education, a Not for Profit entity duly Registered under Indian Companies Act. During the period 2010-2016, he was involved in several initiatives that can broadly be classified as Education Management. In this period, he served a 3-year term as the Vice Chancellor (Pro Voce) of a large multi-disciplinary Education and Research University. The University has Departments in Engineering, Medical Sciences, Arts & Science and Management.

During 2000-2010, Paddu founded Plexion Technologies, funded by JP Morgan, a Technology company dealing with Design and Manufacture of Aerospace systems. It has later been acquired by a large Global conglomerate in 2008 and he worked as its CEO for a further period of two years.

Prior to this, Paddu spent nearly 20 years with Indian Space Research Organisation as Scientist/Engineer. During this period, he was deputed to NASA, USA for a period of 5 years to work as the Project Manager of an Indo US Spacelab 3 Program on board the Space Shuttle, Challenger.

Paddu has a PhD in Aerospace Engineering from Indian Institute of Technology, Bombay. Paddu's other interests and participation includes Community

Development and has been part of several Rural upliftment Programs. Well connected with NGO's, Rotary and Lions community in India, South East Asia and Japan, he enjoys working hands-on with local communities on projects relating to Poverty alleviation, Local Societal issues etc. He is also Founding member of a Skill Training Initiative of Govt of India.



Panel Member 1
Swathi Parasher
Group Director
Aeronautical Development
Establishment (ADE)

Swathi Parasher is the Group Director for Electrical Design and Integration group at Aeronautical Development Establishment (ADE), DRDO at Bangalore. Swathi completed her Master of Science in Physics from Pune University and joined ADE, DRDO. She has 25 years of vast experience in the field of system integration, test system development and testing of the UAV systems. Swathi has worked on the various class of UAV systems designed and developed by ADE, namely LAKSHYA, NISHANT, RUSTOM -1, TAPAS, NIRBHAY which is a cruise missile and ABHYAS which is an expendable aerial target.



Panel Member 2
Dr. Senthil Kumar
Professor, MIT

Professor Dr. Senthil Kumar, an outstanding technocrat has distinguished himself as a pioneer in the Indian UAV scene. He has made possible the Lab to field research contribution, especially from Universities, in the field of Unmanned Aerial Systems popularly called as Drones. The concept to translational research to end user capabilities of his UAV research had been vouched by various topmost civilian and military authorities in India and worldwide, notable being his Excellency our former President Dr APJ Abdul Kalam and DARPA, Department of Defense USA.

Prof Senthil Kumar may best be described as an Educator and Entrepreneurial Scientist who with his practical mentoring approach to science had been able to identify and bring forth creative energies out of budding engineers and thereby making them innovators and potential leaders they are, in the field of Aerospace Engineering.

His contributions towards rise of Drone awareness and Drone entrepreneurship in the country commenced well in the early 2005 and the commendable achievements being Outstanding performances of his team in the DARPA, Drone Challenge organized by Department of Defense, USA, Australian Medical Express Challenge, Swarm Drones for Indian Army and Indian AirForce, Drone based precision

agriculture, water resource management, smart city/town planning and Smart Governance, surveillance and safety, Mapping and preservation of natural resource, Skill improvement and employment for rural and urban population, Disaster management and Rescue and Relief, Public Health and safety and the list is endless. Presently, the development Engineers/ Scientist are working on programmes towards development of up to 100 kg class of Unmanned Aerial Vehicles with different payload carrying capability of 20 kg and are certain that such activity will yield fruitful results immediately.



Panel Member 3
Dr. Omkar
Chief Research Scientist

Dr. Omkar serves as the Chief Research Scientist at the Department of Aerospace Engineering, Indian Institute of Science. His research interests include Uninhabited Air Vehicles (UAVs), Autonomous Navigation of UAVs, Helicopter Dynamics, Satellite Image Processing, Yoga and Biomechanics.

Dr. Omkar heads the UAV lab, Computational Intelligence lab and Yoga & Biomechanics labs.

He has published more than 140 articles in leading international technical journals. He is also the convenor (TED 14:1) sub-committee on “Standardization of Drones in India”, under Bureau of Indian Standards

Dr. Omkar was also a Panellist and Coordinator at the “Vaibhav Summit”, Global Summit of the Overseas and Resident Indian Scientists and Academicians.



Panel Member 4
Shripathi V
Technical Manager,
MSC Software

Shripathi leads the Aerospace Technical Division at MSC Software Corporation, Indo-Pacific region. He started his career at Indian Institute of Science as a Project Engineer, worked on MAV Design & Analysis and Thermo-Structural Analysis of Satellite Solar Panels. Shripathi is currently working with MSC Software on Aeroelasticity, Structural Dynamics, Optimisation, Generative Design, Thermo-Mechanical, Composites and various integrated simulation solutions over a decade. Shripathi has credit of implementing various advanced simulation solutions at Global OEMs. He played a key role in providing integrated simulations to indigenous Indian Defence projects.

Shripathi has notable international publications on Aeroelasticity and related technologies.



Panel Member 5
Dhiren Marjadi

Vice President, Global Business
Development – Aerospace and
Defense, Altair

As vice president of its global aerospace and defense business, Dhiren Marjadi is responsible for accelerating Altair’s business in the global aerospace and defense industry. He is responsible for delivering industry-specific solutions to Altair’s sales team to expand the company’s near-term business and aligning its product management and development tasks with customer requirements and industry trends.

Marjadi has over 36 years of professional experience of which over 30 years have been with Altair where he has held several positions including those in technical, program management, sales, and business development. He is an experienced presenter and regularly speaks at industry events worldwide about aerospace industry challenges and trends.

Marjadi holds a Bachelor of Technology degree in mechanical engineering from the Indian Institute of Technology, Kanpur, and a Ph.D. in mechanical engineering from the University of Missouri.