



VISTARA ADDS JEDDAH TO ITS INTERNATIONAL NETWORK



AIRBUS A321XLR TAKES OFF FOR THE FIRST TIME

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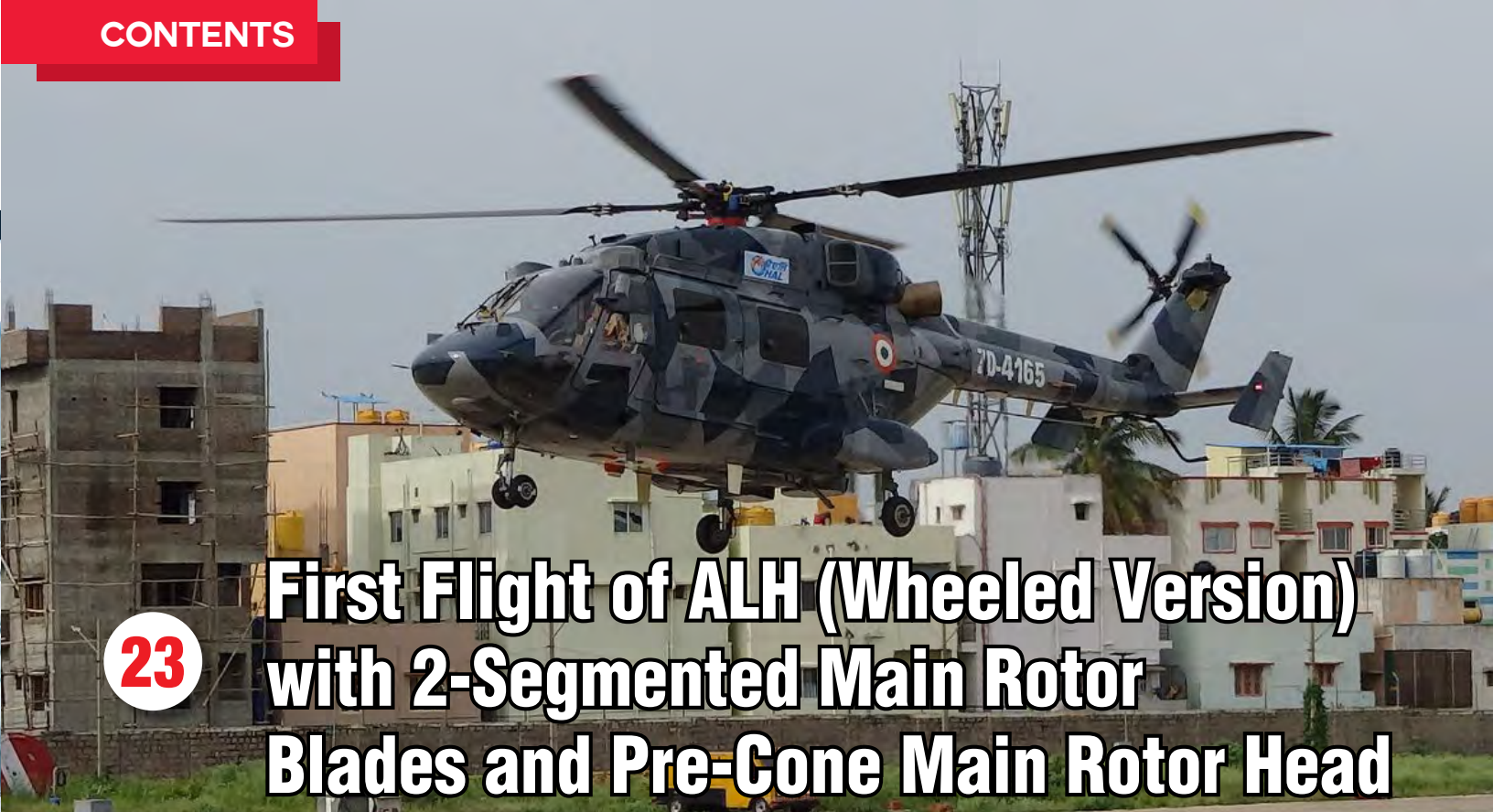
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The post-pandemic aviation industry is back on a roll, from many firsts like the first Airbus A321XLR taking flight to the first aircraft with 100 percent sustainable fuel tested successfully and the first helicopter powered by SAF taking off, the month was power-packed with Airlines like Jet and Akasa Air ready to kick-start operations in India. New mergers and acquisitions are mushrooming all over the world, operators are giving more preference to sustainable aviation, passenger traffic is at an all-time high and airlines are expanding their routes across the globe. Our latest edition of Aviation Update covers all the above and much more.

India is going through a new era of expansion by being one of the fastest fastest-growing aviation markets in the world. Our cover story focuses on the initiatives taken by NALSAR University for aerospace and defense education in India. Safran's recent expansion in India to develop the largest MRO has not gone unnoticed in global aviation circles, in a candid chat with Mr. Franck Saudo, CEO of Safran Helicopters we have discussed their recent JV with HAL, investment and expansion plans in India and their view of HAL as a business partner.

This issue also covers exclusive Q & A with the CEO of Alliance Air, Mr. Vineet Sood in which he talks openly about the changes that he implemented, the challenges in the Indian aviation sector, and its take on the Indian aviation market. Also, read our exclusive interview with Dr. Bala Bharadwaj of SAE India in which he shares his wisdom of spending over half a Century in the aviation sector and Pros and Cons of being in aviation, and much more.

With this issue, we hope to carry a message of positivity and support for the entire aviation sector grappling with post-pandemic problems. We thank all our readers for the love and support that you continue to shower upon us as we continue to bring you the latest updates from the aviation industry.

Thanks

B. Kartikeya
Editor

■ VISTARA ADDS JEDDAH TO ITS INTERNATIONAL NETWORK



Vistara announced an Early Monsoon Sale across its domestic and international network. The sale is available on all three cabins - Economy, Premium Economy and Business for travel period between 20 June 2022 and 31 December 2022 (Blackout dates apply).

Bookings under the sale are open for a period of 48 hours from 0001 hours of 2 June 2022 to 2359 hours of 3 June 2022 with one-way fares for domestic routes starting at INR 1,699 for Economy, INR 3,459 for Premium Economy and INR 7,439 for Business Class (exclusive of convenience fee).

On international routes, all-inclusive return fares start at INR 14,249 for Economy, INR 18,899 for Premium Economy and INR 47,099 for Business Class.

In line with its vision to expand globally, Vistara also announced non-stop flights between the second largest city of Saudi Arabia, Jeddah and Mumbai starting 2 August 2022, bookings for which are being progressively opened across channels.

Commenting on the launch of the new international route, Mr. Vinod Kannan, Chief Executive Officer, Vistara, said, "The launch of services to Jeddah will further intensify our presence in the Middle East region. Saudi Arabia shares a strong bilateral relationship with India and is home to a significant population belonging to the Indian diaspora, thereby offering great prospects for Vistara's growth. We are delighted to bring India's best airline to the modern commercial hub of Saudi Arabia

and hope that our customers will truly enjoy the award-winning product and services of Vistara."

■ SPICEJET LAUNCHES SKY MALL ON ITS IN-FLIGHT ENTERTAINMENT PLATFORM, SPICESCREEN



SpiceJet announced the launch of Sky Mall on its in-flight entertainment platform, SpiceScreen. The authentic in-flight online shopping experience curated by India's leading e-commerce portal, Snapdeal will feature products and deals from leading product categories like apparels, jewellery range, electronics and cosmetics among others.

Passengers on all domestic flights operated by SpiceJet can now browse and pick from a catalogue of high-quality electronics, fashion accessories, headphones, mobile chargers and other items, specially curated by Snapdeal. Confirmation for orders placed in-flight will be obtained on landing and items will be home delivered pan-India.

Debojo Maharshi, Chief Business Officer, SpiceJet said, "We are delighted to introduce a truly online shopping experience to flyers @36,000 ft. Our passion for customer service often manifest into innovative and industry-first products and services such as Sky Mall. Snapdeal's integration into our in-flight entertainment platform SpiceScreen is part of our commitment to constantly innovate and enhance our guests' travel experiences. We hope to continue to delight our passengers with enhanced services and offerings."

Ravi Malani, Head of Product Management, Snapdeal Limited said, "We are delighted to partner with SpiceJet in our on-going journey to provide multi-channel access to Snapdeal's category-defining merchandise.

Both SpiceJet and Snapdeal are pioneers in how they serve the value savvy customers of Bharat. With this launch at SpiceJet, Snapdeal attempts to make online commerce relevant and efficient for such customers by offering a large selection of high-quality, value merchandise now not just on the ground but even during the Flight at 36,000 feet."

■ INDIGO INTRODUCES ADDITIONAL FLIGHTS ON DELHI-LEH, DELHI-SRINAGAR AND LUCKNOW PANTNAGAR ROUTES



IndiGo announced additional frequencies between DelhiLeh, Delhi-Srinagar, and Lucknow-Pantnagar effective from July 01 and July 15, 2022, respectively. The Delhi-Leh flight will operate daily at 4:20am from July 01 and will operate at 4:30am from August 01, 2022. To cater to the high demand IndiGo will be adding two additional daily flights for Srinagar from the period between 01 July till 11 August 2022, departing from Delhi at 05:20 and 21:30 and from Srinagar at 07:20 and 23:15. These flights will strengthen IndiGo's network in northern India.

Mr. Sanjay Kumar, Chief Strategy and Revenue Officer, IndiGo said, "We are pleased to strengthen our network by adding frequencies on Delhi-Leh, Delhi-Srinagar and Lucknow-Pantnagar routes, catering to increased demand for travel to Ladakh, Uttarakhand and Kashmir. Delhi – Leh is one of the most popular routes and we have been witnessing high demand on this route, with this new addition we will have 3 daily flights from Delhi. We are getting a good response to our Lucknow-Pantnagar flight and with the increase in

frequency, this flight would now operate five days a week. These new frequencies will not only promote tourism, trade, and commerce in the states, but also make travel affordable to these destinations through additional capacity. We will strive to stay true to our promise of affordable fares, on-time performance, courteous and hassle-free service across wide network, onboard our lean clean flying machines.”

■ AIRBUS A321XLR TAKES OFF FOR THE FIRST TIME



Airbus’ first A321XLR (Xtra Long Range) has successfully accomplished its first flight. The aircraft, MSN 11000, took off from Hamburg-Finkenwerder Airport at 11:05 hrs CEST for a test flight which lasted approximately four hours and 35 minutes. The aircraft’s crew consisted of experimental test pilots Thierry Diez and Gabriel Diaz de Villegas Giron, as well as test engineers Frank Hohmeister, Philippe Pupin and Mehdi Zeddoun. During the flight, the crew tested the aircraft’s flight controls, engines and main systems, including flight envelope protections, both at high and low speed.

Philippe Mhun, Airbus EVP Programmes and Services stated: “This is a major milestone for the A320 Family and its customers worldwide. With the A321XLR coming into service, airlines will be able to offer long-haul comfort on a single aisle aircraft, thanks to its unique Airspace cabin. The A321XLR will open new routes with unbeatable economics and environmental performance.» Entry into service is targeted for early 2024.

The A321XLR is the next evolutionary step in the A320neo single-aisle Family of aircraft, meeting market requirements for increased range and payload, creating more

value for airlines by enabling economically viable services on longer routes than any comparable aircraft model.

■ ATR TARGETS INCREASING OPPORTUNITIES FOR REGIONAL AIRCRAFT IN JAPAN



ATR is stepping up its presence in Japan as the country sees an increase in demand for regional aviation in the wake of the pandemic.

Speaking in Japan, ATR CEO Stefano Bortoli, said: “We see 100 ATR aircraft flying in Japan in a few years. Air transport is crucial for the archipelago, where air routes are essential for domestic travel and transportation. We want to help ensure that aviation contributes to a prosperous future for Japan by connecting its regions ever more sustainably and affordably. Most of the new ATRs will replace older, less efficient models, and will connect islands and remote regions with the country’s major cities.”

Promoting economic development and connecting communities in all parts of the country while ensuring the lowest level of environmental impact is one of Japan’s main challenges. ATR aircraft already provide an immediate answer as they burn 40% less fuel and emit 40% less CO2 than similar-size regional jets, contributing to the Japanese government’s goal to cut emissions by 46% by 2030. The numerous innovations shortly available including the new PW127XT engine and the possibility to use up to 100% sustainable aviation fuel will further reduce ATR’s emissions.

Fabrice Vautier, SVP Commercial, said: “Japan and ATR are a great match. The Japanese airlines that operate ATR aircraft can connect all regions, even remote ones, to larger hubs in Japan in a sustainable

manner, thanks to the unique combination of low operating costs and low emissions. Soon, with the Short Take-Off and Landing version of our aircraft, we will contribute to serving even smaller airports across the Japanese archipelago: there are 10 airports in Japan with short airstrips that provide vital links for those communities.”

■ AKASA AIR UNVEILS ITS AIRLINE CREW UNIFORM



Akasa Air unveiled the first look of its airline crew uniform, featuring a youthful and contemporary design, and colours that reflect the warm, friendly and happy personality of Akasa Air. Keeping in mind ergonomics, aesthetics and comfort, Akasa Air is the first Indian airline to have introduced custom trousers, jackets, and comfortable sneakers for its airline in-flight crew.

The uniform is inspired by the company’s core beliefs of employee centricity and sustainability. The trouser and jacket fabric has been specially made for Akasa Air, using recycled polyester fabric which is made from pet bottle plastic salvaged from marine waste. The uniform fit focuses on providing the best possible stretch to ensure employees’ comfort over their busy flight schedules. Designed by Rajesh Pratap Singh, the jacket draws inspiration from the Indian bandh gala and is forward-looking in a modern version of the garment.

Given the mobile lifestyle of crew members

and long hours spent standing, Vanilla Moon designed sneakers that are light, and contain extra cushioning from heel to toe to ensure better support. In line with Akasa Air's approach towards sustainability, the sole of the sneakers is carved from recycled rubber and manufactured without any use of plastic.

Describing the inspiration behind the uniform, Belson Coutinho, Co-Founder and Chief Marketing & Experience Officer, Akasa Air, said, "Employee centricity and sustainability are going to be at the core of everything that we do at Akasa Air. We have designed a uniform in which our team feels both proud and comfortable as they direct their energy to ensure a warm, friendly, and efficient flying experience for all our passengers".

"These uniforms are a perfect amalgamation of style and sustainability and reflect Akasa Air's core values. From concept to the final outcome, it has been an exciting journey for me to work on these designs and present one of the most unique, sustainable and functional uniforms of our times," said Rajesh Pratap Singh, who worked with Akasa Air to create the uniform.

Deepika Mehra, Founder, Vanilla Moon, added, "We are delighted to share this shoe design - which is sustainably produced, functional, comfortable, gender-neutral and contemporary. The design also reflects Akasa Air's employee-centric culture to ensure their comfort."

■ NEW BOEING ECODEMONSTRATOR PROGRAM TESTING 30 SUSTAINABLE TECHNOLOGIES ON A 777-200ER



Boeing unveiled its 2022 ecoDemonstrator with a livery that honors a decade of testing to reduce fuel use, emissions and noise. The latest ecoDemonstrator, a Boeing-owned 777-200ER, will test about 30 new technologies aimed at improving sustainability and safety for the aerospace industry, including a water conservation system and technologies to improve operational efficiency.

"Boeing is committed to support our customers and enable the commercial aviation industry to meet our shared commitment to net zero carbon emissions by 2050," said Stan Deal, Boeing Commercial Airplanes president and CEO. "The ecoDemonstrator program's rigorous testing of new technologies further enhances the environmental performance of our products and services and is invaluable to continuously improving safety."

During six months of flight and ground tests starting this summer, the 2022 ecoDemonstrator will evaluate:

- In collaboration with NASA, SMART vortex generators – small vertical vanes on the wing – that improve aerodynamic efficiency during takeoff and landing
- A system to conserve onboard water and reduce weight as well as fuel use
- Additively manufactured airplane and engine parts to help reduce fuel use and manufacturing waste
- An environmentally preferred refrigerant and a new fire suppression agent to reduce greenhouse gas emissions
- A heads-up enhanced vision system for pilots to improve operational efficiency
- Continued comprehensive study of the impact of sustainable aviation fuel toward the reduction of emissions
- For all flight tests, the 777-200ER will fly on a highest approved blend of sustainable aviation fuel (SAF) available

"The Boeing ecoDemonstrator program brings together the two most important ingredients to a more sustainable future –

innovative technologies and partnerships with customers, suppliers, government agencies and academia," said Chris Raymond, Boeing Chief Sustainability Officer. "We celebrate the past successes and look forward to continuing this iconic program to help decarbonize aviation, together."

Since its initial flights in 2012, the Boeing ecoDemonstrator program has accelerated innovation by taking new technologies out of the lab and testing them in an operational environment. Including this year's platform, the program has tested about 230 technologies to help decarbonize aviation, improve operational efficiency and enhance safety and the passenger experience. Approximately a third of tested technologies have progressed onto Boeing's products and services.

■ TURKISH AIRLINES AND INDIGO RESUME THEIR EXISTING CODESHARE PARTNERSHIP



IndiGo and Turkish Airline have resumed their codeshare flights and partnership by opening the sale earlier this month. Scheduled operations will be restarted in a phased manner with the first flight effective yesterday. The codeshare is considered as Bilateral Free Flow Codeshare wherein both the airlines will place its code on another's flights. The agreement will enable both the carriers to provide more flexibility of choice to the customers on sectors between India and Istanbul, amongst others.

In the first phase, both the airlines are open for sale, with Turkish Airlines as the marketing carrier and IndiGo as the operating carrier. Turkish Airlines will be

placing its code on trunk route flights operated by 6E on the Delhi-Istanbul route and later from six domestic destinations in India including Ahmedabad, Amritsar, Bengaluru, Chennai, Mumbai and Kolkata.

Ronojoy Dutta, Wholetime Director and Chief Executive Officer, IndiGo said, "We are pleased to resume our strategic partnership with Turkish Airlines to offer more options to our passengers. Owing to the recovery of overall aviation industry, this agreement will extend our on-time, affordable, courteous and hassle-free travel experience by expanding the choices available to our customers for journeys beyond Istanbul, using Turkish Airlines' extensive network through a dozen destinations covered by our agreement."

Bilal Ekdi, Chief Executive Officer Turkish Airlines, said, "After witnessing two tough years of pandemic, airline industry is now in the new period which will enable us to recover and improve partnerships. In this new era, every cooperation has become more important for each airline. We are very happy to see that as Turkish Airlines and IndiGo, we reactivated our codeshare cooperation by resumption of our flights between Turkiye and India. I am glad to announce that our passengers will continue to experience better connections by this opportunity."

■ SPICEJET SECURES KEY CERTIFICATIONS FOR INTERNATIONAL CARGO OPERATIONS INTO EU AND THE UK



SpiceJet that it has secured RA3 (Regulated Agent Third country) and ACC3 (Air Cargo or Mail Carrier operating into the Union from a Third Country Airport) certifications. The certifications will allow SpiceJet to not only transport mail and

cargo on its own airplanes under its Air Operator Permit but also handle cargo and mail of other airlines for transporting to or via the European Union and the United Kingdom. In addition, these certifications confirm that SpiceJet meets the security requirements for screening air cargo and mail entering the European Union and United Kingdom under their supply chain initiative.

Ajay Singh, Chairman and Managing Director, SpiceJet, said, "These certifications are an attestation of our commitment to aviation safety and adherence to the highest and most stringent security standards in our operations. The new certifications will help SpiceJet gain new business opportunities from international airlines, freight forwarders, cargo agents, international couriers as it allows us to seamlessly carry cargo both to and via the European Union and the United Kingdom."

SpiceJet successfully cleared stringent cargo security audit and on-site verification to check compliance with the latest standards in European Union and the United Kingdom. ACC3 and RA3 are supply chain security initiatives designed by the European Union to secure and regulate inbound air cargo and mail coming in from other countries.

Currently SpiceJet's operations at airports in Mumbai, Delhi, Chennai, Hyderabad, Bengaluru, Thiruvananthapuram, Ahmedabad and Kochi are ACC3 certified for both EU and the UK. Kolkata is certified for EU operations and expected to receive certification for the UK operations soon.

■ SPICEJET FLAGS OFF ITS FIRST HAJ 2022 FLIGHT FROM SRINAGAR



SpiceJet ushered in India's Haj pilgrimage for the year as it flagged off its first special Haj flight from Srinagar today. A SpiceJet

Boeing 737-800 departed on its schedule time from the Srinagar airport with 145 passengers on-board.

SpiceJet will operate 37 special Haj flights for pilgrims travelling to Mecca for the annual pilgrimage. The special flights from Srinagar will depart for Medina between 5th June and 20th June 2022. Return flights from Jeddah to Srinagar are scheduled from 15th July to 31st July, 2022.

SpiceJet is proud to be the only Indian airline operating Haj flights this year. Shri. Manoj Sinha, Hon'ble Lieutenant Governor of Jammu & Kashmir, joined the launch event virtually. SpiceJet will deploy its 737-800 aircraft for these special flights.

■ FIRST FLIGHT IN HISTORY WITH 100% SUSTAINABLE AVIATION FUEL ON A REGIONAL COMMERCIAL AIRCRAFT



ATR, Swedish airline Braathens Regional Airlines and sustainable aviation fuel supplier Neste collaborated to enable the first ever 100% SAF-powered test flight on a commercial regional aircraft. The test flight further supports aviation's decarbonisation targets and acceleration of SAF certification. When used in neat form Neste MY Sustainable Aviation Fuel reduces greenhouse gas emissions over its life cycle by up to 80%* compared to fossil jet fuel use.

This historic test flight took place in Sweden and is part of the 100% sustainable aviation fuel (SAF) certification process of ATR aircraft that started in September 2021 in cooperation with Braathens and Neste and should be completed by 2025. It has been the latest in a series of successful ground and flight tests on the ATR 72-600 prototype aircraft performed at the beginning of 2022, including flights with 100% SAF in one engine, and today was the first time it was done with 100% SAF in two

engines.

Achieving the milestone was also made possible by Swedavia enabling the SAF to be uplifted to the ATR aircraft at Malmö airport and Pratt & Whitney, closely working together with ATR and Braathens in the preparations of this milestone flight.

Today's flight is proof that speeding up the transition to net-zero carbon emissions can only be achieved when all stakeholders within aviation work closely together. It is a milestone not just for Sweden but globally showing that the technology is available and has significant benefits to aviation, today and in the future.

Chief ATR pilot Cyril Cizaburoz, Jean-Marie Marre, co-pilot, and Pascal Dausin, Flight Test Mechanic, flew the Braathens' aircraft from Malmö a coastal city in southern Sweden to Bromma near Stockholm, which took around 1 hour and 20 minutes. The results of today's flight will be analyzed and released at a later date.

■ ICAO ASSEMBLY MUST ADOPT LONG TERM ASPIRATIONAL GOAL TO DECARBONIZE AVIATION



The International Air Transport Association (IATA) called for governments to adopt a Long Term Aspirational Goal to decarbonize aviation at the 41st Assembly of the International Civil Aviation Organization (ICAO) later this year. The call came at the 78th IATA Annual General Meeting (AGM) and World Air Transport Summit (WATS) where airlines are mapping out the pathway to the industry's commitment to achieve net zero emissions by 2050 in line with the Paris Agreement's 1.5°C goal.

"The decarbonization of the global economy will require investment across countries and across decades, particularly

in the transition away from fossil fuels. Stability of policy matters. At the IATA AGM in October 2021, IATA member airlines took the monumental decision to commit to achieving net zero emissions by 2050. As we move from commitment to action, it is critical that the industry is supported by governments with policies that are focused on the same decarbonization goal," said Willie Walsh, IATA's Director General.

"Achieving net zero emissions will be a huge challenge. The projected scale of the industry in 2050 will require the mitigation of 1.8 gigatons of carbon. Achieving that will require investments across the value chain running into the trillions of dollars. Investment at that magnitude must be supported by globally consistent government policies that help deliver the decarbonization ambition, take into account differing levels of development, and do not distort competition," said Walsh.

"I am optimistic that governments will support the industry's ambition with an agreement on a Long Term Aspirational Goal at the upcoming ICAO Assembly. People want to see aviation decarbonize. They expect the industry and governments to be working together. The industry's determination to achieve net zero by 2050 is firm. How would governments explain the failure to reach an agreement to their citizens?" said Walsh.

Data from a recent IATA survey shows that improving the environmental impact of airlines is seen as a post-pandemic priority for passengers, with 73% of people polled wanting the aviation industry to focus on reducing its climate impact as it emerges from the COVID crisis. Two-thirds of people polled also believe that taxing the industry will not achieve net zero faster and expressed concern about the money raised not being earmarked for decarbonization projects.

■ SAAB RECEIVES ORDER FOR INTEGRATED AIR TRAFFIC CONTROL IN DUBAI



Saab's Integrated Air Traffic Control Suite has been selected through competition for implementation at Dubai International Airport and Al Maktoum International Airport in the United Arab Emirates. The contract, awarded to Saab by Dubai Aviation Engineering Projects includes approximately 95 controller working positions which will be distributed between the two airports, the Emirates Flight Training Academy, and the Contingency Operations Center.

Saab's Integrated Air Traffic Control Suite (I-ATS) is a next-generation solution that builds on widely deployed Air Traffic Control automation products. I-ATS is a flexible and scalable digital platform that provides tower and approach controllers with a comprehensive set of tools to safely and efficiently manage traffic flow. The solution for Dubai International Airport (DXB) and Al Maktoum International Airport (DWC) also includes a Departure Manager (DMAN), which supports sequencing of departing aircraft.

"All the key aspects of I-ATS have been developed in close cooperation with the end users themselves, with a primary focus placed on ease of use, improved situational awareness and reduced controller workload. This solution will support Dubai Aviation Engineering Projects in the step forward to upgrade the towers to the latest digital platforms and provide a more efficient workflow for the controllers," said Per Ahl, Head of Marketing & Sales, Air Traffic Management Tower Systems at Saab.

Saab will roll out the programme in a phased approach, starting with workshops to design the control tower and the configuration of the I-ATS Human Machine Interface. The finished implementation will include a test and validation platform, as well as a contingency and an operational system for each airport. The majority of the controller working positions will be located in the DWC systems, as that airport will be roughly five times larger than DXB.

Gulfstream G800 Makes First Flight

Gulfstream Aerospace announced the all-new ultralong-range Gulfstream G800 successfully completed its first flight, officially launching the flight-test program of the industry's longest-range aircraft. Announced in October 2021, the G800 is the latest addition to Gulfstream's next-generation fleet to take flight and make progress toward customer deliveries.

The G800 departed Savannah/Hilton Head International Airport at 9:00 a.m. and landed there two hours later. In keeping with Gulfstream's commitment to sustainability leadership in aviation, the aircraft made the flight using a blend of sustainable aviation fuel.

"When the first G800 test aircraft rolled out at our announcement last fall, we changed the game once again for our industry," said Mark Burns, president, Gulfstream. "At Gulfstream, working closely with our customers allows us to continuously build on our successes and develop aircraft that exceed their expectations. The G800 pushes the boundaries of performance even further with Gulfstream-designed aerodynamics and cabin technology, and we look forward to our customers benefiting from the longer range at higher speeds in our exceptional cabin environment."

"We have announced eight new aircraft in the past decade, strategically timed to capture market demand," said Burns. "We are seeing great interest in the G800, and this first flight brings us even closer to delivering a Gulfstream for every mission."



Bombardier Inaugurates Quadruple-sized Singapore Service Centre, the Largest OEM business aviation facility in Asia Pacific

Bombardier announced the grand opening of its newly transformed Singapore Service Centre, the largest OEM business aviation maintenance facility in Asia Pacific. A key jewel of the next major investments in Bombardier's growing worldwide customer service footprint, the newly expanded facility features substantially enhanced service capabilities for its growing fleet of Learjet, Challenger and Global aircraft operators. The facility will also accommodate Bombardier's newly launched Global 8000 business jet when it enters into service in 2025.

Located at the growing Seletar Aerospace Park, the Singapore Service Centre, which opened in 2014, has more than quadrupled its current footprint from 70,000 sq. ft. (6,500 m²) to approximately 290,000 sq. ft. (27,000 m²). The massive expansion introduces exceptional new customer facilities for business jet operators, including a full-service, environmentally-controlled paint facility, advanced interior finishing capabilities, with key support functions, such as engineering, sales and customer support and an expanded portfolio of component, repair and overhaul (CR&O) services. This also includes the option for Global aircraft customers to lease BR710 engines from Rolls Royce stored on site, significantly reducing downtime and costs.

The expansion also adds sought-after new heavy structural and composite repair capabilities as well as an integrated parts depot that will serve the site and the region, adding more than US\$15 million in additional parts inventory. The expanded Singapore Service Centre is expected to support more than 2,000 business jet visits annually.

"With this major expansion, the Singapore Service Centre will provide infinite benefits, including quicker aircraft turnarounds, greater convenience and peace of mind to Bombardier's growing customer base in Asia," said Jean-Christophe Gallagher, Executive Vice President, Services and Support, and Corporate Strategy, Bombardier. "Customers can also enjoy access to the complete range of OEM customer service and support at their doorstep. This is truly a special day for Bombardier and our growing aftermarket network."



Daher completes its acquisition of the Stuart, Florida aerostructures production facility

Daher has marked a major expansion of its U.S. industrial presence by acquiring the metallic and composite aerostructures assembly facility in Stuart, Florida, reinforcing the company's position as a Tier 1 supplier for aircraft manufacturers in North America and beyond.

The completion of this acquisition from TRIUMPH was announced, bringing Stuart's approximately 400 employees into Daher's Industry Division – which already is a major supplier of complex aerostructures for leading airframers.

"With the Stuart facility, Daher has reached a critical size that is essential in the aerostructures business, while also marking an important expansion of our overall industrial footprint in North America," explained Didier Kayat, the Chief Executive Officer of Daher. "This represents a crucial element in Daher's long-term strategic plan, and further strengthens our ability to meet supply chain demands as the aviation sector continues its rebound."

Stuart is recognized for its capabilities in the assembly of large, complex metallic and composite aerostructures – such as wing and fuselage assemblies. This complements Daher's well-established competence as a designer, manufacturer, installer and repairer of aerostructures that incorporate various materials, including thermoplastic composites and other leading-edge materials.

"As a family-owned company, our core strengths are built on a long-term vision and a corporate social responsibility policy that values our employees," explained Patrick Daher, the Chairman of Daher's Board of Directors. "We are fully committed to the Stuart facility's future, and look forward to its role in serving our customer base as Daher shapes the aviation supply chain of today and tomorrow."



Fahari orders 40 Eve eVTOL aircraft for Kenya market

Eve has an order for up to 40 eVTOLs to fly people and cargo for Fahari Aviation. The agreement involves joint studies to develop and scale the UAM market in Kenya and a business model for cargo drone operations.

Eve Holding signed a letter of intent with Kenya Airways drone specialist subsidiary Fahari Aviation for up to 40 eVTOL vehicles in March 2022. The agreement includes joint studies through a working group to develop and scale the UAM market and a business model for cargo drone operations in Kenya. The project is expected to start deliveries in 2026.

Eve's eVTOL lift and cruise vehicle is electric-powered and the most practical design for efficiency and certifiability. Its multiple rotors are used to take off and land vertically, and at cruise altitude the rear propellers push the aircraft forward as in wing-borne flight, providing a low noise experience and making it easier to move within cities while avoiding traffic jams.

"Urban air mobility is the future of transport, and we are honoured to be the champions of this in the region. The journey to realise the dream of eVTOL vehicles in Kenya is on course, and the partnership with Eve is a key achievement for us as part of the strategy to adopt new technologies as a growth strategy for the sustainable development of Africa," says Kenya Airways group managing director and chief executive officer Allan Kilavuka.

"This is a new chapter of the Eve and Fahari Aviation partnership to strengthen both companies' commitment to establishing the foundations that will sustainably support the ecosystem for urban air mobility in Kenya. Last year, we announced a collaboration to develop operational models for Fahari Aviation's key markets, and this announcement confirms that it is evolving successfully," says Eve co-CEO Andre Stein.

Fahari Aviation has been focusing on innovative and sustainable solutions to address different issues, such as traffic jams, sightseeing, parcel delivery, agriculture and wildlife protection, and Eve's zero-emission, low-noise and accessible eVTOL, together with its global experience, will benefit the development of air mobility in Kenya.



Second Beechcraft Denali Successfully Completes First Flight, Expanding Flight Test Program to Two Aircraft

Textron Aviation announced the successful first flight of its second Beechcraft Denali flight test article as momentum builds for the clean-sheet aircraft's certification program.

The milestone flight follows the Denali prototype, which completed its first flight in November 2021.

The second test aircraft joins the first Denali prototype in the important flight test program that substantiates the segment-leading performance expected of the Denali. The aircraft's flight lasted two hours and one minute, reaching a max altitude of 15,500 feet with a max speed of 240 ktas. To date, the program has accumulated more than 250 flight hours.

"This flight is another vitally important step for the Beechcraft Denali program as the aircraft will be used primarily for testing aircraft systems like avionics, cabin environmental control and ice protection," said Chris Hearne, senior vice president, Engineering & Programs. "The team has made great progress, accomplishing key goals in the flight test program, and the Denali team heads into the second half of 2022 with a great deal of momentum."

The Denali flight test certification program is expected to eventually include a third flight test article and three full airframe ground test articles as it expands operational goals focusing on testing aircraft systems, engine, avionics and overall performance.



First helicopter flight powered solely by sustainable aviation fuel

An Airbus H225 has performed the first ever helicopter flight with 100% sustainable aviation fuel (SAF) powering both Safran's Makila 2 engines. This flight, which follows the flight of an H225 with one SAF-powered Makila 2 engine in November 2021, is part of the flight campaign aimed at understanding the impact of SAF use on the helicopter's systems. Tests are expected to continue on other types of helicopters with different fuel and engine architectures with a view to certify the use of 100% SAF by 2030.

"This flight with SAF powering the twin engines of the H225 is an important milestone for the helicopter industry. It marks a new stage in our journey to certify the use of 100% SAF in our helicopters, a fact that would mean a reduction of up to 90% in CO2 emissions alone," said Stefan Thome, Executive Vice President, Engineering and Chief Technical Officer, Airbus Helicopters.

The use of SAF is one of Airbus Helicopters' levers to achieve its ambition of reducing CO2 emissions from its helicopters by 50% by 2030. One of the main benefits of using this new fuel is that it allows the aircraft to minimise its carbon footprint while maintaining the same flight performance.



Aviation Update Editor Kartikeya In conversation with **Mr. Franck Saudo**, CEO of Safran Helicopters.



Congratulations on the new venture with HAL. What are the exact plans in the new JV recently announced? Where will it be established and when will production happen?

Thanks a lot. We are immensely proud to further strengthen our relationship with Indian aerospace sector. Regarding the JV, our intention is that the SafranHE and HAL will be equal partners in all activities; hence it will continue on a 50-50 basis. The JV will commence within a few months and work towards designing a new engine for all future HAL Helicopters. The two partners will decide together on the exact location for the facility.

What are SHE plans for further new programs in India?

The JV will be dedicated to the development, production, sales and support of helicopter engines and one of its main objectives will be to meet the requirements

of HAL and India's Ministry of Defence (MoD) future helicopters, including the future 13-ton IMRH (Indian Multi Role Helicopter) and its naval variant the Deck Based Multi Role Helicopter (DBMRH). The JV will also look for export markets once the requirements of HAL are met.

How much is Safran Helicopters planning to invest in India and how much is the team in India likely to grow?

The investment will reflect the workshare of each party, which is currently 50-50. The exact amount will be worked out in due course and both sides are fully committed to meeting their obligations. Regarding recruitment, this will also be studied soon by both sides and we are committed to develop new talent in aero-engines domain in India.

Can you tell us more about your other JV in Goa announced early this year and when will it be

operational?

Helicopter Engines MRO Pvt Limited (HE-MRO) is a joint venture of Safran Helicopter Engines and HAL, at Sattari, 40 km from Panaji in Goa. The 1,000 sqm training and office facility and a 3,800 sqm international class shop facility will provide MRO (Maintenance, Repair and Overhaul) services for Safran TM333 and HAL Shakti engines installed on HAL-built helicopters to increase the operational readiness of the Indian Armed Forces.

HE-MRO will be operational by the first quarter 2024 with a capacity to repair 50 engines a year and a full-capacity goal of 150 engines in the coming years. It will also bring employment opportunities to over 60 qualified engineers and technicians of the region. The facility has an expansion capacity for other engines in the future and will support all our future MRO needs in India.

How do you consider HAL as

Partner for you in India?

HAL is a major partner for Safran Helicopter Engines and we are proud to further expand our structuring relationship with them through HE-MRO and the creation of this new joint venture for design and development of Helicopter engines. We are proud to have worked with HAL to make various versions of HAL designed Helicopters for Indian Armed Forces. With a fleet of over 1,000 engines, India's Armed Forces are one of the largest operators of Safran-designed helicopter engine and we are very proud of that.

“

With a fleet of over 1,000 engines, including TM333 and Shakti , India's armed forces are one of the largest operators of Safran-designed helicopter engines. Shakti is the Indian variant of the Safran Ardiden 1H1, co-developed with HAL. HAL has produced over 500+ Shakti engines till date successfully.

”

Safran and HAL to develop new helicopter engines in joint venture



Safran Helicopter Engines and Hindustan Aeronautics Limited (HAL) have signed an agreement to create a new joint venture intended to develop helicopter engines. Through a Memorandum of Understanding (MoU), signed by Mr. R. Madhavan, HAL CMD, and Mr. Franck Saudo, Safran Helicopter Engines CEO in presence of Olivier Andriès, Safran CEO, both partners will extend their long-lasting partnership by establishing a new aero-engine

company in India. It will be dedicated to the development, production, sales and support of helicopter engines and one of its main objectives will be to meet the requirements of HAL and India's Ministry of Defence (MoD) future helicopters, including the future 13-ton IMRH (Indian Multi Role Helicopter).

Mr. Franck Saudo said: "The creation of this new joint venture marks a turning point in our relationship with HAL and the Indian MoD with the development and production of a new generation of helicopter engine. We are proud to further expand our structuring partnership with HAL, which began more than 50 years ago, and which was recently illustrated with the development and production of the Shakti engine and the inauguration of our joint venture Helicopter Engines MRO Pvt Limited (HE-MRO). With a fleet of over 1,000 engines, India's Armed Forces are one of the largest operators of Safran-designed helicopter engines".

Mr. R. Madhavan said: "Safran Helicopter

Engines has been our valued partner for several decades. We now look forward to utilize this opportunity to leverage HAL's experience in manufacturing of more than 15 types of aircraft and helicopter engines to jointly co-develop and manufacture engine with immediate focus on IMRH and its naval variant the Deck Based Multi Role Helicopter (DBMRH). This partnership will involve and utilize the Indian Defence manufacturing ecosystem within India".

Safran Helicopter Engines and HAL have already multiple partnerships, including the Shakti engine, which powers HAL-produced helicopters, including the Dhruv, Rudra and the Light Combat Helicopter (LCH). The Ardiden 1U variant also powers the new Light Utility Helicopter (LUH). More than 500 Shakti engines have already been produced

Through HE-MRO joint venture in Goa, Safran Helicopter Engines and HAL will also provide MRO (Maintenance, Repair and Overhaul) services for TM333 and Shakti engines in service with Indian Armed Forces. It will be operational by the end of 2023.

Airbus A321XLR's advanced composite airframe and CFM LEAP1A engine provided by Hexcel

Hexcel is a major supplier of advanced composite materials for the airframe and the CFM International LEAP-1A engine that powered the Airbus A321XLR, which took its maiden flight recently. These innovative lightweight composite materials provide weight savings and performance enhancements that reduce fuel consumption and emissions as well as long-term maintenance costs.

The A320neo family, including the A321 variant, makes extensive use of weight-saving composites supplied by Hexcel. In addition to that Hexcel has also supplied, HexPly carbon fiber prepregs and HexWeb honeycomb to Airbus since the A320 was launched, and the A321XLR benefits from wing tip devices

called Sharklets made from Hexcel's HexPly M21E/IMA. For the LEAP-1A engine, Hexcel supplies HexTow IM7 carbon fiber for all the fan blades and containment cases, in addition to HexPly carbon prepreg and engineered core for the nacelles.

The A321XLR creates more value for the airlines by bringing 30 percent lower fuel burn per seat than previous-generation competitor aircraft. The aircraft will deliver an unprecedented range of up to 4,700nm – 15 percent more than the A321LR and with the same unbeatable fuel efficiency.

With this added range, airlines will be able



to operate lower-cost single-aisle aircraft on longer and less heavily traveled routes – many of which can now only be served by larger and less efficient aircraft. This will enable operators to open new worldwide routes such as India to Europe or China to Australia, as well as further extend the A320neo family's non-stop reach on direct transatlantic flights between continental Europe and the Americas.

Rolls-Royce advances hybrid-electric flight with new technology to lead the way in Advanced Air Mobility



Current battery technology means all-electric propulsion will enable eVTOL and

fixed wing commuter aircraft for short flights in and between cities and island-hopping in locations like Norway and the Scottish Isles. By developing turbogenerator technology, that will be scaled to serve a power range between 500 kW and 1200 kW, we can open up new longer routes that our electric battery powered aircraft can also support.

Rolls-Royce experts based in Germany, Norway and Hungary are developing the turbogenerator design and working on its system integration and are focused on ensuring smart power distribution during flight. The turbogenerator will recharge batteries after take-off or power propellers directly, enabling aircraft to switch between power sources in flight. The research and development of this technology is being part funded by the German Ministry for Economic Affairs and Climate Action.

Rob Watson, President – Rolls Royce

Electrical, said: “Rolls-Royce will be the leading provider of all-electric and hybrid-electric power and propulsion systems for Advanced Air Mobility and will scale this technology over time to larger platforms. I would like to thank the German Government for their support. As part of our strategy, we are looking at offering the complete sustainable solution for our customers. This means extending routes that electric flight can support through our turbogenerator technology. This will advance hybrid-electric flight and mean more passengers will be able to travel further on low to net zero emissions aircraft.

“Rolls-Royce is also set to build on our existing network to offer maintenance services for electrical systems. Furthermore, Rolls-Royce Power Systems is able to offer mtu microgrid solutions to support fast-charging of electric aircraft and deliver reliable, cost-effective, climate friendly and sustainable power to vertiports.”

Pratt & Whitney and Embraer Complete 100% SAF Flight Testing of GTF-powered E195-E2 Aircraft

Pratt & Whitney and Embraer have successfully tested a GTF-powered E195-E2 aircraft on 100% sustainable aviation fuel (SAF). The test, with one engine running on 100% SAF, validated that GTF engines and the E-Jets E2 family can fly on both engines with blends of up to 100% SAF without any compromise to safety or performance. The aircraft completed two days of ground tests at Fort Lauderdale International Airport, culminating in a 70-minute flight test at Vero Beach Regional Airport in Florida.

“The E2 is already the most efficient single aisle aircraft flying today, saving up to 25% CO2 emissions compared to previous generation aircraft. This reduction in emissions can be increased up to an impressive 85% with 100% SAF. Replacement of older aircraft by new

generation products and scaling up SAF production are the two most effective actions commercial aviation can take now to achieve a significant reduction in emissions,” said Rodrigo Silva e Souza, vice president strategy and sustainability at Embraer Commercial Aviation.

“Embraer and Pratt & Whitney are leading the industry with products that are more efficient for our customers and more sustainable for our society. This test demonstrates that the E2 is ready for 100% SAF certification and operation once the industry finalizes standards.”

All Pratt & Whitney engines and Embraer aircraft are currently certified to operate with SAF blended up to 50% with standard Jet A/A1 kerosene, according to ASTM International specifications. Future specifications will enable blends of up to 100% SAF to maximize the emissions



reduction potential of using fuel derived from sustainable, non-fossil-based feedstocks.

“SAF is a core part of our sustainability road map, and we continue to work with industry partners and regulators to support the development of a drop-in standard for 100% SAF,” said Graham Webb, chief sustainability officer at Pratt & Whitney. “This test proves that GTF engines can operate on any fuel, and that the E-Jets E2 family is ready for 100% SAF certification once the industry finalizes the standard for unblended SAF.”

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INDIAIRPORT Exhibition to be organized on **Airport Technology**, Supported by **GATE – German Airport Technology & Equipment & Federal Ministry for Economic Affairs and Climate action of Germany**.

Radeecal Communications, India partnered with **IFW Expo Heidelberg GmbH, Germany** to organize **INDIAIRPORT Exhibition** as Pilot project at India Expo Center Mart, Noida, NCR, India during 22-24 November 2022. **GATE – German Airport Technology & Equipment & Federal Ministry for Economic Affairs and Climate action of Germany** announces their Supporting Partnership & Supporting authority respectively for the show. A formal announcement made from PHD Chamber of Commerce & Industry will join this initiative as Industry Partner.

After the impact of Covid Pandemic Civil Aviation, industry is looking to optimize and forcing itself to revive to pre-Covid numbers. Whereas **Government of India & PM launches Gati Shakti- National Master Plan** for infrastructure development in India with wide focus of developing and establishing domestic air connectivity via building new airport at revolutionary pace.

We aim **to support** the initiative of **Government of India and creating a platform**, IndiAirport as the first exclusive physical exhibition offering an ideal opportunity vide displaying of the latest technologies for the effective airport solutions and high quality services. The participants of the airport products, services and solutions to meet and engage with senior and middle management from **airports, airlines, government agencies, regulators, ground handlers, architects, engineers, consultancies, suppliers and the buyers will have an unparalleled access to all encompassing network opportunities**. This exhibition to witness around 200 exhibitors (National as well as International Private and Government Units/ Departments). These three days of Exhibition and Conference planned with the vision, **“Our government has the honor of bringing an aviation policy that is transforming the sector.” “Atma Nirbhar Bharat” and “Make In India”** in support of our Hon’ble Prime Minister- **Shri Narendra Modi**.

India is on the path to develop its greatest air connectivity since the independence, as per the Civil Aviation Minister Jyotiraditya Scindia, Indian Airport industry to attract 1 Trillion Rs. Of investment by Year 2024 and hoping the total passenger traffic to rise to 400 million by 2023-24. As per Civil Aviation Minister Jyotiraditya Scindia until 2014, only 74 airports were built in the country, following the new government in 2014 in next 7 years another 66 new airports were added to the list of **total 140 airports in the country**, which we resolve to take to 220 by 2025, he said.

Considering rising market for the companies related to airport development and contributors of airport technologies are highly encouraged to participate in the only, standalone show of the industry named **INDIAIRPORT** in the month of November 2022.

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AEROSPACE AND DEFENCE EDUCATION IN INDIA: NALSAR'S INITIATIVES

Scope and Opportunities in Aviation Sector: Sky is the limit when it comes to the aviation industry. Plethora of education and employment opportunities in the lucrative aviation industry is well known. Civil Aviation Industry in India is experiencing a new era of expansion driven by factors such as low cost carriers, modern airports, foreign direct investments in domestic airlines and airports, cutting edge information technology interventions and growing emphasis on regional connectivity. Further, India Aviation Industry promises huge growth potential due to large and growing middle class population, rapid economic growth, higher disposable incomes, rising aspirations of the middle class and overall low penetration levels. The growing aircraft fleet size, strategic location advantage, rich pool of engineering expertise and lower labour costs etc. have huge potential.

Air transportation is growing rapidly and thanks to an interconnected global community and a thriving tourism sector combined with a strong safety record. The industry employs an estimated 65.5 million workers globally with 10.8 million of those jobs being indirect suppliers to the aviation industry. According to the International Air Transport Association (IATA) air travel worldwide will double to 8.2 billion travellers in the year 2037, largely as a result of airlines taking advantage of the current aviation industry trends. Despite the latest trends driving industry growth, the aviation industry as a whole will also need to focus on how to continue to meet these demands while adhering to increasing safety and environmental regulations and battling geopolitical turbulence.

India presently has over 400 airports and the plan is to expedite development of Airports in the country with the goal of

opening 100 new airports by the year 2024. In fact, a vision document released by the Ministry of Civil Aviation in January, 2020 suggests that there will be around 200 new airports in India by 2040. India's aviation industry is largely untapped with huge growth opportunities, considering that air transport is still expensive for the majority of the country's population, of which nearly 40% is the upwardly mobile middle class. Career opportunities in the aviation industry are extensive and promising. To succeed in this field, one need to have strong technical skills, communication skills and interpersonal skills. Jobs in this industry are demanding.

Aviation sector is witnessing a systematic transition from a public sector controlled to a private sector dominated industry. The reform process in aviation industry had a far reaching impact and helped to unleash the enormous growth potential. Over the

past decade, Aviation sector witnessed a robust growth trajectory except last two years because of Covid-19 Pandemic. There are great opportunities and the future is even more exciting. Competition is the best regulator for any market. It will provide quality service at affordable price. The Air passengers will have enough choices. In the near future it is expected that every District of India will have at least one or two world class airports.

Scope and Opportunities in Space Sector: With the starting of many projects and Institutions, India now occupies an important position in the international community for space research. India has also developed capabilities for the use of systems for vital services like telecommunications, television broadcasting, meteorology, disaster warning, survey and management of natural resources. All these activities are to be regulated with a proper legislation related to conducting commercial activities with the help of technological development. India today, is a major power along with all the advanced countries in technical development of space activities. However, it lags behind when it comes to have proper specialized space legislation.

During the last two decades, increasing emphasis on reducing governmental budgets worldwide has forced the world's space faring nations to reassess their civil space programs. Such action requires establishing close working arrangements between government and private industry which facilitate satellite communications, navigation and geographic position location, remote sensing, data processing, support services and infrastructure etc. Developing countries like India are more hard-pressed to allocate funds for these activities. Therefore, the need for privatization of space activities deserves the maximum attention in countries like India, which need these activities even more than their richer counterparts for their national development. A mutually rewarding partnership between the Indian space programme and industry has been built over the past two decades, which brought about a sense of appreciation and confidence from the private sector.

Despite being debated in some quarters in

India as detrimental to national interests, the last one-decade has seen India reap rich dividends of the fruits of privatization and globalization. The potential of India in the field of space technology is no less than computer software and it has even greater prospects for India's all-round development and progress. One of the recent examples of the fruits of the marriage of privatization and space technology has been the discovery of largest reserves of natural gas in southern India by the Reliance Group of Companies. This need for privatization has not only been reflected in the Citizen's Charter of Department of Space (DOS) but also it has laid thrust on cooperative venture with Indian industries in order to achieve self-reliance. There has been close association with more than 500 industries in the small, medium and large-scale sectors in the form of procurement of contracts, know-how transfers and provision of technical consultancy. Today, the Indian space industry is capable of handling complex manufacturing jobs and advanced technologies. Already more than 250 technologies have been licensed to industries for commercialization and more than 200 technical consultancies have been provided in various areas of space technology.

Today the commercial activities of private space players are assuming wider proportions, ranging from remote sensing, direct television broadcasting, communication, space tourism, space research etc., from the major part of outer space activities. The states are confronted with the problem of regulating these private space activities, as they are liable for any damage caused by the private space activities. It is pertinent to note that, the existing legal regime governing the outer space activities, are inadequate to deal precisely with the nature and extent of the liability of States for the private space activities.

The Modi government made a significant decision in May 2020 to permit private sector participation in the space industry. The key to realising the promise of Indian private enterprise involvement in the Indian space sector is avoiding the pitfalls that come with the Indian State's proclivity to privilege ISRO's monopoly over space science and space technology.

Indian National Space Promotion and Authorization Centre (IN-SPACe) encourage private companies to use India's space infrastructure. IN-SPACe will provide a level playing field for private companies to use Indian space infrastructure. It will also hand-hold, promote and guide the private industries in space activities through encouraging policies and a friendly regulatory environment. The Public Sector Enterprise 'New Space India Limited (NSIL)' will endeavour to re-orient space activities from a 'supply driven' model to a 'demand driven' model, thereby ensuring optimum utilisation of our space assets. NSIL is meant to help the private sector with transfer of some technologies to the private sector, especially the small satellite launch vehicle that is being developed and even the older PSLV. NSIL has come up as an assisting body to the Isro to facilitate private participation in its programmes. IN-SPACe will work on the mechanism for Isro's engagement with industries and to meet demands of the private sector in space programmes.

With the emergence of the New Space Sector, there is a growing private space industry in India that needs to be supported by establishing legal aspects of space activities for private industry. This is important at both the international and national level, with the former needing consideration under the purview of the international treaty obligations of India and the latter for the development of the private industry ecosystem.

Scope and Opportunities in Defence Sector: India has the potential to emerge as a global platform for defence research, manufacturing, supply chain sourcing, software development, and offsets, which will strengthen our defence capabilities and spur industrial development as well as exports in this sector. Government is also carrying out reforms in defence procurement to increase efficiency, invite foreign players with excellent capabilities and encourage domestic industry. It has introduced policies to strengthen technology transfer, including liberalized FDI in defence production. Make in India the new flagship program of Government of India has put a renewed emphasis on creating a conducive policy environment for improving domestic defence manufacturing.

These radical initiatives present opportunities for the foreign companies to enter India and local companies to collaborate and design, develop and showcase their engineering strength.

This will also further India's objective to create jobs, catalyze technology development, and transform India into a self-reliant nation with export capabilities in defence sector. India's existing wealth of talent, technology and cost advantages together can help make defence products globally competitive. It is estimated that India's defence sector requires \$130-150 billion for modernization and restructuring in order to become self-reliant in the coming decade. The recent Strategic Partnership policy for defence production is aimed at increasing private sector participation in defence manufacturing in India. Private sector needs a level playing field. FDI liberalisation, slashing of red tape and tax incentives can make a difference.

In recent years, the Indian startup ecosystem has taken off and it is in the process of maturing itself. Positive factors in this process includes the availability of funding, consumer growth, consolidation activities by a number of firms, evolving technology and a burgeoning demand within the domestic market has led to the emergence of startups. The legal framework regulating business in India broadly need numerous aspects, namely; Incorporation and establishment of Company, Labour Policy, Free and Fair competition/ Protectionist regime, Sector Specific Policies, Financial regulations, Scheme of rehabilitation and Revival, Dispute Resolution, etc. in defence sector.

Following the outbreak of COVID-19, the Finance Minister said that the automatic route limit for foreign investment in the defence sector will be increased from 49 percent to 74 percent. The global original equipment manufacturers ("OEM") lobby had long demanded this, citing concerns about transferring high-end, proprietary technology to Indian companies they could not manage. As a result, while the government's action is unquestionably a positive step that should boost foreign investment in the sector, the impact of other features of the current regulatory framework may dampen this optimism.

The reality of the Indian defence ecosystem is that the vast majority of foreign investments are made for offset purposes, and are initially limited to the production of low-tech products, spare parts, and components. The initial roadblock to such technology transfer has been removed with the acceptance of foreign control and the enhanced 74 percent limit. However, allowing Indian joint ventures with 74 percent foreign participation to compete in domestic procurements as Indian vendors will encourage knowledge transfer. There was a significant emphasis on the notion of "Atmanirbhar Bharat". It has been highlighted that India has been an IT behemoth for the longest time, but unfortunately, it has not been able to achieve a stronghold over production and manufacturing sectors. Accordingly, there is an increasing need to utilise the latest technologies and equipment, while at the same time reducing India's reliance on imports through self-reliance by way of Atmanirbhar, Made in India schemes, etc. which will also create more and more job opportunities in the defence sector.

NALSAR's Initiatives: NALSAR University of Law has always proved to be one of the best Law Universities that offers unique and value-added courses in diverse areas of law. One of the contemporary but neglected areas in Indian legal realms has always been the Aerospace and Defence education. In order to fill in this gap and to promote further studies and research in this field, the University established the Centre for Air and Space Law (CASL) in the year 2005 and later it upgraded as the Centre for Aerospace and Defence Laws (CADL) with the object of "Aerospace, Defence and Maritime Education at the door steps of Needy with affordable cost". NALSAR through CADL has also launched few innovative and value added programmes such as Two-years Masters in Aviation Law and Air Transport Management, Masters in Defence and Security Laws, Masters in Space and Telecommunication Laws, Masters in Maritime Laws. CADL also introduced One-year Advanced P.G. Diploma in Aviation Law and Air Transport Management, Maritime and GIS and Remote Sensing Laws. The curriculum of the programme is a tailor-made to meet the professional needs of the aviation industry-airport,

airline, aerospace, Defence, Maritime, Telecommunications, GIS and Remote Sensing and other related sectors so that the products are in a position to directly take on the core managerial positions in any of these sectors. This unique advantage of a comprehensive understanding of the industry is its operational aspects, managerial functions, legal aspects and of the general management interlined with the Industry a specific module which provides a comprehensive understanding of the industry with the practical exposure. NALSAR aims at expanding the horizons of knowledge in these fields so that the individuals could make an informed choice.

The programmes have been structured to impart practical solutions to the professional managers in their regular work and decision-making processes. The Programmes have personal Contact classes from frontline experts of academics, industry, legal fraternity, in addition to the online support. The Course content and deliveries are as intense as that of regular programmes and prepare the candidates for professional assignments. The reading materials for the courses have been prepared by subject experts and care has been taken to present them in a language that could sustain the interest of the non-law professionals and enhance their interest.

The courses have received an overwhelming response over one decade and are considered as premium programmes amidst similar courses offered by other institutions. Regulators have already made a mark for its content delivery and pedagogy. These courses can be taken by fresh graduates and even by working professionals. The Programmes have Personal Contact Classes from frontline experts of academics, industry, legal fraternity, in addition to the online support and updates on course materials through Web.

For further details visit www.nalsarpro.org,
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Prof. (Dr.) V. Balakista Reddy,
Professor of Law and Registrar & Director,
Centre for Aerospace and Defence Laws
(CADL)NALSAR University of Law

High speed Expendable Aerial Target - ABHYAS - successfully flight-tested off Odisha coast

High speed Expendable Aerial Target (HEAT) was successfully flight-tested from the Integrated Test Range (ITR), Chandipur off the coast of Odisha on June 29, 2022. The performance of the aircraft at low altitude including sustained level and high manoeuvrability was demonstrated during the test flight. The target aircraft was flown from a ground-based controller in a pre-designated low altitude flight path, which was monitored by various tracking sensors deployed by ITR, including radar and electro-optical targeting system.

ABHYAS is designed & developed by Aeronautical Development Establishment of Defence Research and Development Organisation (DRDO). The air vehicle was launched using twin under-slung boosters which provide the initial acceleration to the vehicle. It is powered by a small gas turbine engine to sustain a long endurance flight at high subsonic speed. The target aircraft is equipped with Micro-Electromechanical Systems-based Inertial Navigation System for navigation along with the Flight Control Computer for guidance and control along with Indigenous Radio Altimeter for very low altitude flight and Data Link for encrypted communication between the Ground Control Station and Target Aircraft. The vehicle is programmed for fully autonomous flight.

Raksha Mantri Shri Rajnath Singh has congratulated DRDO, Armed Forces and the Industry for the successful flight trial of ABHYAS and said that development of this system will meet the requirements of aerial targets for the Armed Forces.



Tata Advanced Systems and L&T to Deliver 100th Missile Launcher for the Akash Programme for Indian Air Force

Tata Advanced Systems Limited (TASL) and Larsen & Toubro (L&T) have jointly delivered 100th Akash Air Force Launcher (AAFL) for Indian Air Force, developed with Defence Research and Development Organisation (DRDO). This event was flagged off by Dr BHVS Narayana Murthy, DG-MSS, DRDO at the Vemagal facility of TASL (near Bengaluru) on Tuesday, the 21st June 2022. The event witnessed participation by Bharat Electronics Ltd, Missile Systems Quality Assurance Agency, L&T, multiple MSME partners in the programme. TASL has also supplied 49 Akash Launchers earlier to the Indian Army.

Commenting on the occasion, Mr. Sukaran Singh, Managing Director and Chief Executive Officer, TASL said, "The successful delivery of 100th AAFL is a major milestone for TASL and the Indian defence manufacturing sector, and marks the successful establishment of serial production after completing product development. The repeat order of AAFL being executed shows the User's continued satisfaction and confidence in the operational performance of the indigenously developed and produced AAFL system."

Commenting on the occasion, Mr. Jayant Patil, Whole Time Director (Defence & Smart Technologies), L&T said, "L&T has remained singularly focused on offering indigenously designed, developed and manufactured Defence systems to our Armed Forces. Delivery of the 100th AAFL system, a major milestone toward the iconic Akash missile programme epitomizes the contribution made by the Indian industry toward the Vision of 'Aatmanirbhar Bharat'. This milestone is testimony to the core strengths of innovation, adaptability, commitment and hard work by the Indian Industry teaming up in a public-private partnership to deliver a force-multiplying Akash Air Defence system to the Indian Air Force".

AAFL is a multi-technology Weapon Launch Platform for Air Defence Missiles, jointly developed under the IGMDP Programme of DRDO by TASL and L&T and produced collaboratively. AAFL is a Mobile Launcher System capable of transporting and launching up to three Akash Medium Range Surface to Air Missiles in Single or Salvo Mode. AAFL comprises a self-powered and fully-automated Electro-Mechanical Launching System mounted on a trailer and towed by a prime-mover. It is a fully ruggedized all-weather day and night system capable of operating in harsh environmental and terrain conditions.

BEL signs MoU with Defense Initiatives, Belarus

Navratna Defence PSU Bharat Electronics Limited (BEL) signed an MoU with Defense Initiatives (DI), Belarus, and Defense Initiatives Aero Pvt Ltd, India (a subsidiary of DI Belarus), in the august presence of Joint Secretary (DIP) and senior Indian Air Force officials.

The MoU is aimed at co-operation between the three companies for supply of Airborne Defense Suite (ADS) for the helicopters of the Indian Air Force (IAF). BEL will be the prime contractor and will be supported by DI with ToT (Manufacturing and Maintenance) for supply of advanced EW suite for helicopters under 'Make in India' category. The MoU also aims at exploring various business opportunities for India and global markets for ADS. The partnership has evolved under the guidance of Sanjay Jaju, Addl. Secretary, Department of Defence Production, and Indo Belarusian Joint Commission (IBJC) on Military Cooperation.



IAI Awarded Multi-Million Dollar Deal for AESA Airborne Self Protection Jammer Pods for an Air Force in Asia

Israel Aerospace Industries (IAI) has been awarded a new multi-million-dollar deal for the purchase of Scorpius-SP Airborne Self Protection Jammer pods with Active Electronic Scanned Array (AESA) technology (ELL-8222SB), for an air force in Asia. Scorpius-SP is based on cutting-edge AESA technology with multi-beam operation – the ability to simultaneously detect and suppress multiple threats in different directions around the aircraft. AESA multi-beam technology provides exceptionally high sensitivity, allowing the system to detect advanced threats including Low Probability of Intercept (LPI) Radar, and very high jamming power for effective suppression of the targets. These capabilities represent a breakthrough in electronic protection and attack, creating the most effective airborne self-protection system available.

Scorpius-SP utilizes Digital Radio Frequency Memory (DRFM) and a range of sophisticated ECM techniques, providing protection against all types of Air-to-Air (A/A) and Surface-to-Air (S/A) threats in a dense radar-guided weapons environment. Based on IAI-ELTA's best-selling ELL-8222 pod configuration, this compact, lightweight, and aerodynamic pod is similar in contour to A/A missiles and may be installed on outer wing stations of fighters and other aircraft. The jammer significantly enhances aircraft survivability and mission success in today's highly challenging threat environment.

The technology behind Scorpius-SP is based on IAI-ELTA's decades of development and operational experience in AESA technology. In recent years, IAI-ELTA successfully developed AESA to meet the challenging requirements in the domain of electronic warfare (EW), culminating in the Scorpius family of systems that represent the future of EW. Scorpius-SP is the implementation of Scorpius technology for aerial self-protection. Other Scorpius systems include Scorpius-G for ground-based electronic defence, Scorpius-N for naval EW, Scorpius-T for aircrews' live training, and Scorpius-SJ for aerial support and stand-off jamming.

Adi Dulberg, VP & General Manager, IAI/ELTA Intelligence, Comms & EW Division, said: "We are proud to be pioneers in AESA EW, which heralds the next generation in Electronic Warfare. IAI-ELTA's AESA jammer pods will provide our customer with the best protection available today for their aircraft and crews. We will continue to develop and promote innovative solutions in the Scorpius family of AESA EW systems."



Saab Completes EMD T-7A Red Hawk Deliveries from Sweden

The final aft, or rear section, of the T-7A Red Hawk trainer aircraft for the United States Air Force arrived at Boeing from teammate Saab in Linköping, Sweden, signaling the final EMD part delivery.

With both the forward and aft fuselages complete, the two sections were joined together in less than 30 minutes – a fraction of the time it takes for traditional aircraft builds and a testament to the benefits of the T-7A's digital foundation.

In the future, Saab will produce the rear sections at their manufacturing facility in West Lafayette, Indiana. The new facility will allow for shorter shipping times and increased collaboration between Boeing and Saab.

"We're excited to begin building the first trainer jets future Air Force pilots will fly," said Paul Niewald, vice president, Boeing T-7 programs. "Boeing and Saab quality and production teams will be closer, accelerating responsiveness to meet engineering and hardware needs."

"Developed with an engineering approach based on digital models, the T-7A represents a revolutionary approach to developing aircraft," said Jonas Hjelm, head of Saab's Business Aeronautics.

The US Air Force awarded Boeing a \$9.2 billion contract for 351 T-7A advanced trainers, 46 simulators and support. The jet was designed using advanced digital modeling and design techniques, and was developed from concept to first flight in 36 months. The T-7A incorporates open architecture software, digital fly-by-wire controls and advanced cockpit technology that provide a new level of safety and training for future fighter pilots.



First Flight of ALH (Wheeled Version) with 2-Segmented Main Rotor Blades and Pre-Cone Main Rotor Head

The first flight of Advanced Light Helicopter (Wheeled Version) with segmented MRBs (Main Rotor Blades) and MRH (Main Rotor Head) in pre-cone configuration was carried out in Bengaluru, recently. The flight was carried out by Wg. Cdr. Unni Pillai, ED (CTP-RW).

The 2-Segment Main Rotor Blades (MRBs) and Pre-Cone Configuration of Main Rotor Head (MRH) are developed to address the stringent stowage dimension requirement specified by Indian Navy and to improve the Time Between Overhauls (TBO) life of the Main Gear Box, said Mr R. Madhavan, CMD, HAL.

On completion of mandated ground testing of various factors, the prototype helicopter was built with 'Segmented Pre-Cone MRBs' and 'Pre-Cone MRH'. The RTB runs, Ground Resonance test and Clamped Power Ground Run were carried out to be found satisfactory.

The Indian Navy and Coast Guard are operating ALH for the last 18 years supporting their operations for various missions. However, the ship deck based operations of ALH have been limited as the stowage size required for ALH exceeds the hanger sizes available in Navy ships. Segmented blade feature reduces the folded length and width of ALH making it compatible with the hangar space available on most of the Indian Navy ships. Further, the time required for folding or unfolding operations is reduced.

Mr. Arup Chatterjee, Director (Engg. and R&D), HAL said the project was carried out in the shortest possible time with the support of RCMA and DGQA. Detailed flight evaluation is scheduled to ensure the efficacy of the pre-cone configuration.





DRDO conducts successful maiden flight of Autonomous Flying Wing Technology Demonstrator

Maiden flight of the Autonomous Flying Wing Technology Demonstrator was carried out successfully by Defence Research and Development Organisation (DRDO) from the Aeronautical Test Range, Chitradurga, Karnataka on July 01, 2022. Operating in a fully autonomous mode, the aircraft exhibited a perfect flight, including take-off, way point navigation and a smooth touchdown. This flight marks a major milestone in terms of proving critical technologies towards the development of future unmanned aircraft and is significant step towards self-reliance in such strategic defence technologies.

The Unmanned Aerial Vehicle is designed & developed by Aeronautical Development Establishment (ADE), Bengaluru, a premier research laboratory of DRDO. It is powered by a small turbofan engine. The airframe, undercarriage and entire flight control and avionics systems used for the aircraft were developed indigenously.

Raksha Mantri Shri Rajnath Singh has congratulated DRDO and said it is a major achievement towards autonomous aircraft and will pave the way for 'Aatmanirbhar Bharat' in terms of critical military systems.

Secretary, Department of Defence R&D and Chairman DRDO Dr G Satheesh Reddy appreciated the efforts of the teams associated in the design, development and testing of the system.

“KEEP LEARNING AND BE AGILE”

Dr. Bala Bharadvaj, SAE INDIA



What are the initiatives taken by SAEINDIA related to the aerospace domain in the last decade?

SAEINDIA was created 25 years ago, and

it has a strategic partnership with SAE International. At the time when SAEINDIA was created, aviation was not so prominent in India. Only in 2009, as more and more private players started entering the aviation

sector, aerospace was introduced in SAEINDIA

Our central idea is to create awareness and provide opportunities for students, faculty members, and industry personnel to interact with each other and learn. In the past 12 years, we have conducted many conferences, and student events, arranged guest lectures, and organized competitions. We are focussed on learning about aerospace topics and giving people a chance for continued learning even after passing college.

Before we talk about Aviation and business, we would be glad to hear your story on how Aviation has influenced you as a child and brought you here? How did you progress to your current position since you entered this supreme industry?

Curiosity and fascination are the fundamentals that brought me to aerospace. When I was a kid, my dad used to work for the Dunlop Tyre Company.

After the India-Pakistan war of 1965, Dunlop published a magazine featuring military jets. It was extremely fascinating for me, and my interest was instantly piqued when

I read about airplanes. Also, every alternate day a commercial aircraft used to fly over our house. I would run out of my house to see it soaring in the sky.

So, when I joined IIT Madras, I enrolled in the Aeronautical Engineering program and earned a B.Tech. degree. After that, I went to the US and completed a Ph.D. in Aerospace Engineering from the Georgia Institute of Technology in Atlanta

After graduation, I started working at Boston University and was an Assistant Professor teaching courses in Aerospace Engineering for six years. But my heart was in the industry. If you want to design and build airplanes, you must be in the industry. So, I moved to a company called McDonnell Douglas, which eventually merged with Boeing.

But I never stopped being a student. I always found ways of learning about new things that I didn't know and sought out new opportunities. My inclination was toward doing challenging things that brought me out of my comfort zone. I became a project manager, managing large research programs, and later learned about manufacturing, avionics, and strategic planning for future technologies. In 2008 I came to India and got a chance to build a Boeing Engineering and Technology Center. My five-decade-long journey took me from just being a curious boy to a researcher to an engineer/manager then evolving into someone who built a large Engineering & Technology organization.

One of the interesting parts of my journey is that I already had a Ph.D. when I took my first job; I earned an MBA when I was 51 years old.

So though the 'too big to collapse' industry has faced challenges due to the pandemic and is now getting back on its knees, may not be to the earlier state. What are your takings and learnings from this experience?

The pandemic threw the aviation industry out of balance. During the pandemic, big OEMs like Airbus and Boeing had fully

manufactured airplanes sitting undelivered, but now with increasing demand, the aircraft orders are increasing overnight. However, airplane production cannot be ramped up and down overnight. It is a complex industry with many components going into making an airplane and running an airline. There are enough smart people in the industry who know how to make those adjustments, but it will take time for a new normal to be established.

No industry is too big to collapse. Successful companies and industries figure out how to be agile and make adjustments to match market conditions. Having people with the right knowledge, and having the systems in place will enable you to respond to new and challenging situations, this is a fundamental lesson we all have to learn.

How is SAEINDIA helping Academia and Aerospace Industry? What are the challenges you have faced & overcome them?

When it comes to building a career, two or three years of work experience is not enough. It takes many years of hard work, dedication, learning, and evolution within an organization.

When it comes to Academia, you have the faculty segment and the students. We provide many opportunities for the faculty to learn from the industry, about the latest technology, aircraft programs, and innovations. The faculty members can attend conferences and seminars and learn. These days, we conduct many webinars – seminars that can be accessed remotely from your computer. This applies to those in the industry also.

For those faculty who are pursuing research projects, these interactions with industry help them to understand industry needs and better focus their research. For those faculty primarily engaged in teaching, the interactions help to understand industry trends and new technologies of interest.

For the students, SAEINDIA organizes competitions with opportunities to interact with leaders from the industry, apply their

learning, practice team building, etc. The students can also participate in other general events and webinars.

Both the faculty and students are usually eager to interact with the industry. The main challenge is due to the mismatch between the number of faculty and students who have a need/interest when compared to the number of seasoned industry experts who are available to share their expertise.

So, people must learn to make the best use of the resources available. The universities must encourage their faculty to join SAEINDIA and step out to attend these events – either in person or at least virtually.

We also need more volunteers and mentors to come back and share their experiences with the next generation, but it does not happen easily since people tend to get busy with their careers and life events. Based on my experience, when you share knowledge with others, you are not just giving; there is a certain amount of internal learning and growth that happens that is invaluable.

How are they phasing out some of the outdated methods? Are there any areas where traditional methods still have got the upper hand?

In the early days of aerospace, the designs came out of the creativity of the designers and their deep knowledge of the fundamental principles. Once the design is ready, the manufacturing happens in a specialized plant with a team of experts. Thus, first comes the physics, then the methodology of how to convert the physics. In this complete process, the underlined physics changes very slowly. For instance, Aerodynamics works the same way it worked 1000 years ago.

In the 1960s, when Boeing was developing the 747s, most of the complex calculations were done using simpler techniques, reference tables, and mechanical calculators. Using a mechanical calculator was tedious, so the emphasis was on understanding the physics and minimizing the calculations. Physics to me is the traditional method; it will never go away. Nowadays, electronic

computers have made it possible to perform complex calculations more easily, and these Computer-Aided-Engineering tools will continue to evolve and improve designs.

Is the current syllabus and trainers/trainers/professors across aerospace universities in sync with the latest technologies while teaching students? Or are we still taught methods that were twenty years old in aerospace?

What we teach in universities depends on the knowledge of the faculty, the syllabus, and the teaching philosophy. Some faculty members focus on teaching; if they don't actively learn about new trends, they will get more disconnected from the current industry practices. Professors who are researching areas that are farther ahead than current practices are discovering new technologies and innovations. Both these types of faculty benefit from interacting with industry leaders.

Regarding the syllabus, most good universities know what subjects must be covered. While some of the new topics sound exciting, time spent on them should not compromise the effort of building the foundation. My perspective is that universities should focus on educating the students with a solid foundation in the fundamentals. Universities cannot predict what their students will do when they graduate from the university; so, I believe the correct approach would be to teach the core skills needed such as the fundamental principles of the subjects, supplemented with projects and case studies that teach students how to think and apply the principles.

Being a prominent player in the industry for so long, what kind of transformations have you witnessed? What is your view on the advent of delivery drones/ Passenger drones?

The past few decades have seen dramatic changes in aerospace. The transformation has come about mostly by leveraging a

broad spectrum of new technologies – not just in computers and software, but in other areas as well.

Many new materials have been introduced into aerospace making the structure much more efficient. New materials play an especially vital role in engines. The cockpits have leveraged electronics and digital technologies, and are modern marvels compared to their earlier incarnations. Pilots today do not carry big manuals on the airplane, instead, they have all the information available on a tablet the size of a notebook.

The typical airplane that we see today might have the same model number and may even look somewhat like the earlier models on the outside, but it is comparatively much more efficient than its earlier versions. Almost every component used inside an airplane from a plastic knob to an actuator has changed to reduce the weight of the aircraft.

Drones are a relatively new phenomenon. We have drones that look like airplanes on the outside but with no human on board. The more popular ones are the quad-rotor devices. These are using electric motors that can be controlled by an electronic circuit. For the drones, the biggest benefit was not from the aerodynamics part but from the ability to control it with electronics.

The biggest challenge faced by the drone industry currently is to avoid accidents by crashing into each other, other vehicles, or structures.

For passenger drones, safety is of utmost importance. We already have flying taxis with successful trial flights. But they are mostly conducted in remote or deserted areas with fewer chances of hitting an obstacle.

What is the vision of SAEINDIA for the next 5-10 years related to Aerospace?

The vision of SAEINDIA has not fundamentally changed. I was the President of SAEINDIA from 2018 to 2020 and our

focus mainly rests on education and empowerment through knowledge. For –example, we want people to learn more about drones, not just by showing interest in flying them but by learning about the mechanics and electronics powering them. We want people to be more aware of the technical aspects.

And to conclude, your suggestions to the new generation of Aviation & Drone entrepreneurs?

As mentioned earlier, being agile is very important. Those in aerospace must be open to learning as a continuous activity. Your college courses build a foundation for your future growth, once you venture into the career path, it is important to be in touch with the latest trends, otherwise, you tend to become obsolete. You must make an effort to be aware of what is going on around you in terms of technology, products, and the business environment, depending upon your specific role.

A career in aerospace is a long-term commitment. It takes more than 5 years to develop new products in aerospace; complex projects take even longer. People should have patience and persistence to work without getting impatient. Learn to enjoy your work with commitment and take things in their stride.

Regarding entrepreneurs, there are many emerging opportunities in the drone sector. There are exciting technical challenges, but to be successful as an entrepreneur, one has to look beyond the technical aspects. Enterprises, big and small, thrive when they do something useful for others. So, some relevant questions to ask would be, "What product or service are you offering? Who is your customer? Why should that customer choose you as compared to others offering a similar product or service?" The path of entrepreneurship is a long-term commitment requiring a lot of smart and dedicated work in the early years. So, be prepared for it.

Boeing Elects David L. Gitlin to Board of Directors

The Boeing Company Board of Directors announced that it has elected David L. Gitlin as its newest member. Gitlin will join the Aerospace Safety Committee and the Finance Committee.

Gitlin, 53, currently serves as chairman and chief executive officer of Carrier and brings to the Board more than 20 years of aerospace industry experience. He previously served in several executive leadership roles, including as president and chief operating officer of Collins Aerospace Systems, and as president of UTC Aerospace Systems.

"Dave is a proven leader with deep aerospace, manufacturing and supply chain expertise," said Boeing Chairman Larry Kellner. "With his consistent focus on safety and track record of operational expertise, Dave will add critical experience and perspective to our Board."

Boeing President and CEO Dave Calhoun said, «Dave is an excellent addition to our Board as we continue to rebuild trust, strengthen safety and quality and drive stability throughout our operations. We will benefit greatly from Dave's significant experience leading complex enterprises focused on engineering, manufacturing, safety and quality.»

Since April 2019, seven independent directors have joined the Board. These directors collectively bring significant experience in aerospace, safety, engineering, manufacturing, cyber, software, risk oversight, audit, supply chain management and finance. Gitlin's election to the Board fulfills the Company's commitment, as part of the settlement of certain shareholder derivative claims in March 2022, to add another director with aerospace, engineering or safety systems background to the Board.

Rick Deurloo Succeeds Carroll Lane as President of Pratt & Whitney Commercial Engines



Pratt & Whitney named Rick Deurloo president of its Commercial Engines business. In this position, Rick will retain his current responsibilities as senior vice president and Chief Commercial Officer (CCO) for Pratt & Whitney while assuming overall leadership of the Commercial Engines business from Carroll Lane, who has elected to leave the company for another leadership opportunity. Deurloo will assume this expanded role effective immediately and will continue to report to Pratt & Whitney President Shane Eddy.

"Pratt & Whitney's commercial engines business is well positioned for long-term success thanks to its technology and product offerings across a strong portfolio of major platforms such as the GTF, V2500 and mature engines," said Pratt & Whitney President Shane Eddy. "That momentum will continue and grow with Rick, who brings a wealth of experience and a deep knowledge of our commercial customers to this expanded role. I'm confident the commercial business will continue to deliver on our customers' high expectations under Rick's leadership."

Deurloo joined the former United Technologies Corporation in 1998 and has more than 20 years of experience in management and sales in the global aerospace industry. Prior to his role as senior vice president and CCO, where he was responsible for leading and directing all Sales, Marketing and Customer Support worldwide for Pratt & Whitney Commercial Engines and International Aero Engines (IAE), Deurloo held other senior leadership positions including regional vice president of sales for the Americas.

Lane has held leadership roles with the former United Technologies Corporation and Pratt & Whitney for more than nine years, including president of the Commercial Engines business for the past two and a half years, where he led the organization through the pandemic as well as the realignment of the Commercial Engines business.

"We thank Carroll for his leadership in Commercial Engines, and for his decade of distinguished service at Pratt & Whitney and the former United Technologies Corporation," Eddy said.

Bombardier Announces New Appointment in its China Leadership Team

Bombardier is pleased to announce the appointment of Jianwei Zhang as Chairman, Bombardier China, effective immediately.

The appointment of the seasoned professional reaffirms Bombardier's commitment to China where the company continues to offer market-leading business jets and provide aftermarket services at its strategically located service centre in Tianjin.

"I am very happy to welcome Jianwei back to Bombardier, and back at the helm of our important outpost in China. With his strong connections, his outstanding reputation and his deep understanding of China and the West, Jianwei is the perfect ambassador of our company and will provide a welcome bridge between the different cultures to further reinforce Bombardier's presence and impact in China's business aviation market," said Éric Martel, President and Chief Executive Officer. "His appointment, along with our active service centre in Tianjin, are testaments to our long-term commitment to China as a key strategic market and the importance we place in supporting our customers in the region."

Jianwei Zhang, who was previously part of Bombardier's management team, will report to Éric Martel. He brings more than 26 years of experience in the aerospace and transport industries, most of them spent in multiple roles with Bombardier.

M.K. Mishra is New HAL Chief Executive Officer



Mr. Mihir Kanti Mishra has taken over as Chief Executive Officer of HAL's Bangalore Complex. Prior to this, he was heading Aerospace Division as General Manager.

Mr Mishra joined HAL as Management Trainee in 1987 and is a graduate in Mechanical Engineering from Sambalpur University, Odisha. He also holds Master's degree in Aircraft Production Engineering from IIT, Chennai and has undergone Management Programme at IIM, Bangalore.

Mr Mishra started his career in manufacturing and assembly of MiG engines under Transfer of Technology (TOT) programme at Engine Division, Koraput and worked on absorption and assimilation of technical know-how and prove-out of manufacturing process for series production of MiG engines. His 35-plus years of experience in HAL includes a wide array of business verticals - engine, aircraft and space. He also held important positions in manufacturing, assembly, engineering, strategy planning, project management and international marketing.

He led the team to support ISRO, as strategic partner for the prestigious space programs. He was instrumental in driving the business growth by moving upwards in value chain through establishment of new facilities for cryo engine manufacturing and for providing end-to-end realisation of launching vehicle alongwith integration activities.

Mr Mishra as Project Manager, successfully led a team for launching of first Indian civil aircraft. Under his directions, launching and certification of civil version of HAL Do-228-201 aircraft by Indian certifying agency for design, manufacturing, maintenance and training was achieved within a record time. At corporate level, he played a key role in evolving Company's marketing strategy and took initiatives on new market promotion activities and industrial cooperation.

Lockheed Martin Names New Officers for the Treasurer and Controller Roles

Lockheed Martin announced that its board of directors has elected Evan T. Scott as vice president and treasurer, and H. Edward "Ed" Paul, III as vice president and controller, effective immediately.

Scott succeeds John Mollard, who has announced his plans to retire at the end of the year after more than 39 years of service to the company. Paul succeeds Brian Colan, who has also announced his plans to retire later this year after more than 10 years of service to the company. Both Mollard and Colan will serve as strategic advisors until their retirements as part of paired

leadership transitions for the positions.

"Evan and Ed's extensive leadership experience within our global business and finance operations will drive both continued excellence in our core finance functions and focused execution of our growth strategy," said Lockheed Martin Chairman, President and CEO James Taiclet. "I want to thank John and Brian for their many contributions to the success of the company over their decades of outstanding service."

As vice president and treasurer, Scott will lead the corporation's worldwide banking activity, including global treasury operations, foreign exchange and capital markets, rating agency relations, capital planning, facilities and risk management. He also will oversee financial planning and analysis and the LMC Properties subsidiary. Scott began his career at Lockheed Martin in June 1999 and has served as vice president and assistant treasurer since

August 2021. During his more than 20-year career with the company, he has held roles of increasing responsibility within the finance function.

As vice president and controller, Paul will lead the corporation's accounting, government finance, global financial services and financial transformation and systems functions. Paul brings extensive experience partnering with executive management to develop and deploy financial strategies that strengthen Lockheed Martin's financial position, improve performance within our existing businesses and expand into new areas. Paul joined the company in May 2011 and has served as vice president of accounting since March 2015. Prior to joining Lockheed Martin, Paul served in accounting and audit roles at Discovery Communications, Inc. and Ernst & Young LLP and is a certified public accountant.

Safran Helicopter Engines makes management appointments



On 1st September 2022, Florence Gourmanel becomes Executive Vice-President, Human Resources. She succeeds Frédéric Henrion, who has been appointed to another post within the Group.

Florence began her career in 1992 as a management controller with Airbus. In 1993 she joined Technofan¹ as Sales Administration Manager. In 1998, she was appointed Human Resources Manager at CIMPA. She joined Teuchos in 2000 where she served as Human Resources Manager and Human Resources Director.

In 2010, she joined the Electrical Systems Engineering (ISE) division of Labinal², where she was head of the Villemur-sur-Tarn site; then Director of Human Resources for the division before, in 2018, being appointed Director of Human Resources for Safran Engineering Services.

Since May 2022, she has served as Director of Social Development at Safran Helicopter Engines. Florence Gourmanel (54) holds a Master's degree in business economics from the University of Social Sciences in

Toulouse (1992).

Valentin Safir has been appointed Executive Vice-President, Programs. He succeeds Bruno Bellanger, who has been appointed to another post within the Group.

Valentin began his career in 2000 with McKinsey & Company, where he advised major industrial corporations, notably in the Asia-Pacific region, on how to improve their operational performance. He joined Labinal² in 2010 as Director for Continuous Improvement and Supply Chain in the wiring division (Europe & Asia).

In 2013 he was named president of Matis Aerospace³ before being appointed General Manager of Safran Electrical & Power at the Villemur-sur-Tarn plant in 2015. Since October 2018, he has served as President of Safran Engineering Services. Valentin Safir (44) is a graduate of CentraleSupélec (2000) and Cornell University (2000).

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Aviation Update Editor Kartikeya In Conversation with Mr. Vineet Sood CEO Of Alliance Air.

What changes have you implemented since your appointment?

It has given me immense joy to see Alliance Air soar higher each day and advance towards the vision of becoming the number one regional airline in the country. This has been possible with the hard work, dedication and sincere efforts of all the members of Alliance Air. In these months of my tenure:

Have spearheaded employee friendly engagements leading to transparency, grievance redressal & an employee friendly environment. My leadership focus is to build an atmosphere of trust, togetherness and fair empowerment amongst one and all.

My aim is to take Alliance Air to greater heights each coming day while ensuring high service standards & safety levels. Our reputation is our most treasured

asset and the foundation on which we have built our company. Our motto is to exceed our customer's expectations, meet our commitments, continuously innovate our business & deliver excellence. With continuous focus on our vision, goals, project objectives & business solutions we will continue to build stronger and everlasting relationships with our customers that will yield long term results.

Our fleet size has grown. In addition to the 18 ATR 72-600 aircraft our fleet size has grown with the induction of the Made in India Dornier 228 aircraft. We have signed for 2 ATR 42 aircrafts which will be delivered in July and September. These additions to our fleet help us further charter the untapped territories of India with higher altitudes, difficult terrains & shorter runways.

We have revamped the engine maintenance program and brought in change to the

monitoring system, whereby we managed additional engine hours leading to substantial savings. Further, re-negotiated key contracts including base contracts and streamlined the procurement & logistics process ensuring quicker turn around and availability of aircraft parts and better fleet availability.

The separation of Alliance Air from Air India was a major task which encompassed the implementation of the new Passenger Service System (PSS), our new website & operational software. We got recognition as a standalone entity and being the regional carrier for the country. Our routes have always been our USP since many airlines do not operate on these unchartered territories. With our new user-friendly PSS, we were effective in garnering many trade partners who are successfully booking on our system. Our own website www.allianceair.in is a big accomplishment and gives us the opportunity of engaging directly with

our passengers and the edge of speed to market while providing them exclusive offers & benefits.

With the launch of Alliance Air Document Management System which is an authentic platform for dissemination of updated important information of the company, we took a major step towards achieving our goal of being a paperless organization.

What do you see as the biggest challenges in Indian aviation post pandemic and how do you propose to overcome them?

Fortunately, most challenges post Covid are now becoming an opportunity and are being showcased with the Indian aviation Industry operating at pre-Covid levels. However, high fuel cost contributes to a major portion of the operating cost for any airline. Many State Governments have come ahead and adjusted VAT on fuel prices which have supported the aviation sector in India to some extent. A more stable pricing will allow us to fly better.

How does the ATR 72 500/600

fit for Alliance Air? How will the Dornier 228 aircraft help to connect Tier 2 & 3 places?

Alliance Air is a keen participant of the Government of India's flagship scheme UDAN or Regional Connectivity Scheme (RCS) which connects Tier 2 and Tier 3 cities. Under the leadership of our Hon'ble Prime Minister of India, Alliance Air has a major role in connecting Tier 2 & 3 cities to the bigger hubs like Delhi, Mumbai, Hyderabad, Bengaluru, Chennai & Kolkata. The ATR 72-600 is apt for regional, high altitude & difficult terrain airports where large Jet aircrafts are not able to operate. The lives of the middle class are now transforming, and their aspirations are increasing. Given an occasion to travel by air keeping in mind the price, the timing & the convenience – the ATR 72 600 is the perfect choice for them. The Dornier 228 will make trade and tourism grow in the hinterlands of India and will help the locals connect to various parts of the country, specially the ALGs in Arunachal Pradesh. Air travel was earlier considered only by a select few. With the new Civil Aviation

policy, there marks an opportunity to cater to the aspirations of the people of India with the smaller aircrafts. The RCS-UDAN scheme and Alliance Air's fleet has helped the small traders who use to travel by train & are now trading at a higher pace by travelling via air. Alliance Air is proud to support the vision of our Hon'ble Prime Minister whereby giving an opportunity to the common man (one and all) to travel by air.

Is there sufficient airport infrastructure in Tier 2 & 3 Cities in India?

As one witnesses a saturation in the economic growth & opportunities of the major cities of India, parallelly several Tier II and III cities have been found to deliver a successful economic growth in the past decade. Tier II cities like Ahmedabad, Chandigarh, Dehradun, Pune etc have a population of around one million, whereas smaller cities with population less than one million like Keshod, Lilabari, Sindhudurg & Gulburga are termed as Tier III cities.

India has taken initiatives in the last two decades that have enabled significant



investments that provided a huge boost to the aviation sector. The framework for privatisation of airports attracted investors to invest in infrastructure that in turn created an infrastructure for airlines to expand their capacity and increase market size. As a result, quality of passenger experience improved which led to increased capacity and thought processes of some of the largest airports. The launch of UDAN provided incentives to airlines to offer seats at discounted rates. This made flying affordable to Tier 2 and Tier 3 cities thereby opening completely new untapped markets and up-gradation of small airports. The more the economic growth of any city, better will be the connectivity to metros which will also boost trade and tourism.

What is more important to you – improving revenue or lowering costs?

Both have their own aspects. Price has an important role to play in any sector. But to grow, revenue is important. There are fixed costs which cannot be compromised on, so we have many options by which we generate revenue without making consumers feel the burden on their pocket. For example: ancillary sales such as buy on board, seat select, advertisements, excess baggage, pre-paid baggage and many such options where the customer does not get burdened since these are need based requirements for a select few and it further adds onto the revenue of the airline. Further there is always a target audience that is comfortable to pay the required price for a convenient time & comfort.

What is your mid –to long –term outlook for the Indian Market?

With new players in the Aviation sector, trade and tourism will grow faster in India. With an increase in market growth, the economy will mature faster. New players in aviation will also help many sections of the economic world to move away from isolation and will create a ripple effect.

The civil aviation industry in India has emerged as one of the fastest growing industries in the country during the last three years. India has become the third largest domestic aviation market in the world and is expected to overtake UK to

become the third largest air passenger market by 2024. With the help of the Ministry of Civil Aviation and under the Leadership of our Hon'ble Prime Minister, India is growing by multiple folds in the aviation market.

Most fares offered by airlines are at par, but a few differentiators would set the airlines apart. Taking advantage of our USPs, for example: all window & aisle seats, minimal noise & smooth landing, crew to passenger ratio 1:35, aircraft type with distant rows providing space, better seat pitch, aircraft type being able to fly to different terrain areas (short runways & higher altitude destinations). Using our USPs to our advantage will surely help us get an edge over competition. It's all about how we position our product in the market.

What is it like to be the CEO of Alliance Air?

It has been a completely different challenge working with Alliance Air. But in the absence of challenges, there is no excitement to work. Challenges motivate you to work hard for the organization to reach new heights. I believe Alliance Air has the power to move on the top and become the leading Regional airline of the

country. We are the first airline to acquire the HAL Made in India Dornier Aircraft for commercial purpose. In end July Alliance Air will also have its own ATR-42 which can operate on high terrain areas. Going forward Alliance Air plans to expand its operations to neighboring SAARC countries.





CENTRE FOR AEROSPACE AND DEFENCE LAWS (CADL) NALSAR UNIVERSITY OF LAW, HYDERABAD DIRECTORATE OF DISTANCE EDUCATION (DDE)

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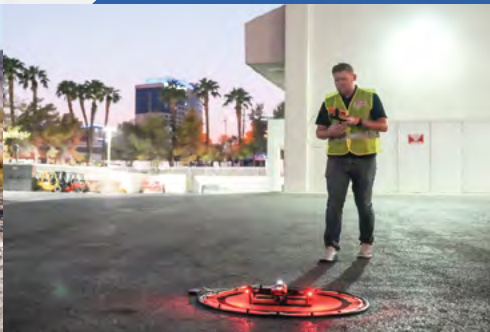
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