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INDIA.**



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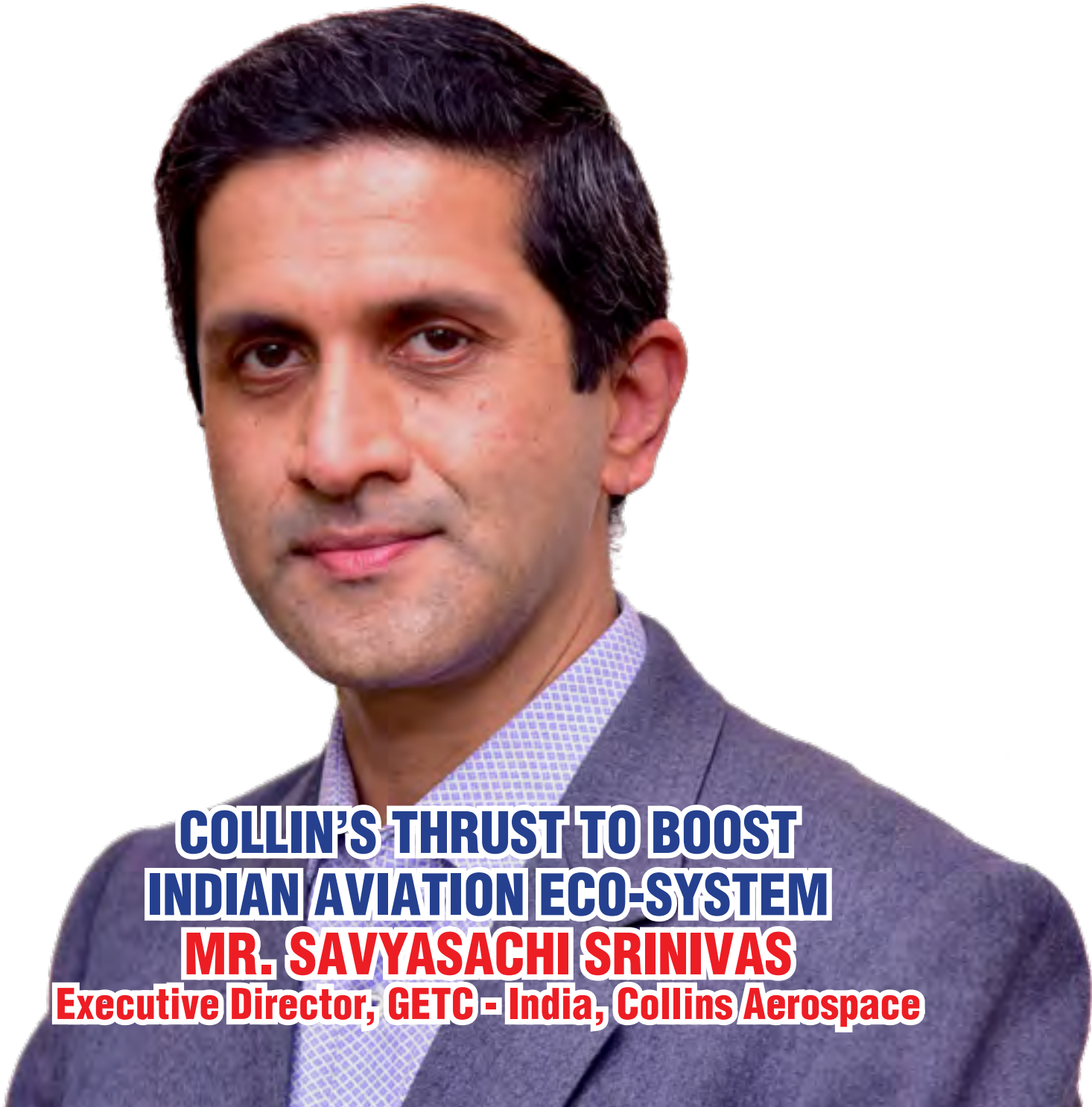
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UPDATE



**COLLIN'S THRUST TO BOOST
INDIAN AVIATION ECO-SYSTEM**

MR. SAVYASACHI SRINIVAS

Executive Director, GETC - India, Collins Aerospace



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From the editor's desk

The aviation industry, one of the safest, quickest, and most reliable modes of transport is growing at a rapid pace by generating economic growth, creating jobs, and facilitating international trade and tourism. The latest figures reveal that air transport will increase by an average of 4.3% per annum over the next 20 years. As per ICAO, if this growth path is achieved, by 2036 air transport is expected to contribute 15.5 million direct jobs and USD 1.5 trillion of GDP to the world economy. Taking tourism into account, these numbers could rise to 97.8 million jobs and USD 5.7 trillion in GDP.

The reflection of the above figures is already visible around the global aviation aftermarket, with airlines across the globe undergoing rapid expansion and modernization with Next-Gen sustainable fleets. Recently, Delta Air Lines signed up for the highly efficient 737 MAX while ANA placed a firm order of about 20 B737-8 at the famous Farnborough Air show. Our August edition brings you a glimpse of the latest updates from Farnborough, with a special focus on major news from Indian aviation circles.

With UDAN and Regional Connectivity scheme on a roll, new airports are inaugurated, newer airlines are taking to the skies and more foreign OEMs are investing and expanding in India. The Ministry of Civil Aviation has vowed to inaugurate about 200 airports in the next couple of years. Thus, one can only imagine the magnitude of growth Indian aviation is about to witness. We have made a sincere attempt to capture this very growth in our current issue.

Turn to page 20 for an Exclusive Interview with Mr. Savyasachi Srinivas, Executive Director, Engineering at Collins Aerospace wherein he discusses in detail the Collins expansion plans in India, the pain points, and in-focus issues, sustainability, challenges, and much more.

For now, just sit back, relax and enjoy a glimpse of the progress and growth of the aviation sector as we take you around the global skies.

■ STAR AIR TO EXPAND REGIONAL CONNECTIVITY, ADDS 2 EMBRAER E175 AIRCRAFTS



In its effort to strengthen India's regional connectivity, Star Air, the aviation vertical of Sanjay Ghodawat Group, announced the regional carrier has signed a Letter of Intent (LoI) for two Embraer E175 aircraft with Nordic Aviation Capital (NAC), the largest Regional Aircraft Lessor in the world. The same was announced during a press event organized by Embraer at the Farnborough International Airshow, UK in presence of senior officials from Embraer and Star Air.

With unparalleled potential, India's regional sectors are one of the fastest growing aviation markets in the world. At Star Air, we are striving to establish a fleet of Embraer aircraft that will improve regional connectivity. Offering the right capacity at affordable fares, we pledge to support the growing demand across India as we prepare for the Ministry of Civil Aviation's plans to build 100 airports.

Eager to welcome the E175 to the Indian skies, the E175 powered by General Electric's CF34-8E engines, has no middle seats and provides best in class legroom with comfortable seating arrangement. With a flying range of 2,200 nautical miles, Star Air is set to fly longer, faster, and smoother. Currently flying over 18 destinations across India, the airline is all geared up to grow and expand its regional presence.

"After witnessing a strong recovery in air travel, we are excited to partner with Embraer as we constantly seek Connecting Real India and make travel accessible, reliable, and affordable. As one of the fastest-growing Indian regional airlines,

we are excited to touch new horizons and explore the skies with great vigor. The E175 aircraft will not only add flexibility and efficiency to our network but will also strengthen our customer relations as we provide them with an unparalleled flying experience." said Shrenik Ghodawat - Director, Star Air.

■ AKASA AIR'S SECOND AIRCRAFT ARRIVES IN INDIA.



Akasa Air welcomed the arrival of its second Boeing 737 MAX aircraft, VT-YAB, at the Indira Gandhi International Airport in New Delhi. The timely induction of the aircraft to the airline's fleet will help boost Akasa Air's operations and its phased approach to support network expansion plans. Akasa Air aims to induct 18 aircraft by the end of March 2023, focusing on connecting metro to tier-2 and tier-3 cities.

Earlier on June 21, Akasa Air had welcomed the first of its 72 Boeing 737 MAX aircraft, VT-YAA in New Delhi, marking the first time in eight years that a domestic jet aircraft with new livery was seen in Indian skies.

Over the next five years, the airline will operate a fleet of 72 ultra-modern, brand-new 737 MAX aircraft powered by the highly fuel-efficient CFM LEAP B engine. This will make the airline the youngest and greenest fleet in the country. With lowest seat-mile costs for a single-aisle airplane and high dispatch reliability coupled with a premium passenger experience, the 737 MAX is one of the strategic factors that will give Akasa Air a competitive edge in India's dynamic commercial aviation market.

■ VISTARA PARTNERS WITH ULTRAMAIN ELB FOR PAPERLESS OPERATIONS; TO BECOME THE FIRST INDIAN AIRLINE TO INTRODUCE E-TECH LOGBOOK



Vistara will become the first Indian airline to introduce an e-tech logbook solution and go paperless in its operations, by appointing ULTRAMAIN ELB.

ULTRAMAIN ELB will fully replace aircraft paper technical log, cabin log, journey log, damage log, and fueling log providing a validated electronic Certificate of Release to Service (e-CRS) on flights operated by Vistara. Currently in the airborne proving stage, the ELB application will be used by Flight Crew, Cabin Crew, and Engineers on iOS devices to provide integrated workflows with Vistara's maintenance and operational systems. The airline is seeking necessary approvals from relevant authorities before fully integrating this solution across its operations. Once implemented, ULTRAMAIN ELB will enable accurate, real-time global operational visibility of the Vistara fleet resulting in more efficient maintenance, higher dispatch reliability, and increased aircraft utilization.

"Vistara remains committed towards constantly improving operational efficiency across processes through automation and

we've been investing in right technologies to achieve this goal. We are delighted to partner with Ultramain Systems, which will provide the first Electronic Logbook to seek operational approval to operate a fully electronic Technical and Cabin Logbook in India. Ultramain ELB will be integrated with various live processes like AMOS, ACARS, and ARMS for seamless operations. This application, with its completeness and ease of use, is one step towards building enterprise application integration while also focussing on sustainable operations.", said Sisira Kanta Dash, Senior Vice President - Engineering & Maintenance, Vistara.

"As Vistara marches on its Digital Transformational journey, the focus on digital data capture, integration and automation will continue. ULTRAMAIN ELB will help digitize our aircraft paper logs and improve operational effectiveness." said Vinod Bhat, Chief Information Officer, Vistara.

"We are pleased to welcome Vistara to the ULTRAMAIN ELB family. As well as our well proven defect management functions. Vistara will be using ELB's refuel / defuel functions, which enable real time capture of refueling documentation using Ultramain's e-Signature capabilities. This is another important step towards the automation of Line Maintenance Operations" said Mark McCausland – President and CEO of Ultramain Systems.

■ RECARO AIRCRAFT SEATING BL3710 SELECTED FOR INDIGO'S NEW A321N, A320N AIRCRAFT



The Recaro Aircraft Seating (Recaro) BL3710 was selected to outfit IndiGo's brand-new

A320neo and A321neo aircraft. The low-cost airline will be the first to feature the bestselling economy class seat in the Indian sub-continent. The BL3710 economy class seat will be installed on 75 Airbus aircraft starting from January 2023.

Dr. Mark Hiller, CEO at Recaro Aircraft Seating said, "Our new partnership with IndiGo demonstrates our commitment to not only building a distinct product with a sustainable lifecycle, but also our comprehensive approach to customer service. The BL3710 is an excellent product that will serve both IndiGo and its passengers for many years."

A Red Dot Design Award winner and iF Design Award winner, the BL3710 was specifically created for short and medium-haul flights. The combination of the ergonomic design and weight of less than 10kg per pax has made the economy class seat a bestseller since it first entered the market in 2019.

Mr. Sanjay Kumar, Chief Strategy & Revenue Officer of IndiGo said, "As we expand our network, domestically and internationally to cater to the travel demand, the comfortable seats will be key to upgrading the customer experience onboard IndiGo."

Since its founding in 2006, IndiGo has grown into India's largest passenger airline. Today, the low-cost carrier flies passengers to 74 domestic and 25 international destinations on its fleet of over 280+ aircraft.

■ STAR AIR SUCCESSFULLY CONCLUDES INDIA'S FIRST INDIGENOUS LEVEL-3 TRAINING ON EMBRAER 135/145 (INCLUDING LEGACY 600/650)



India's first indigenous Level-3 Training on Embraer 135/145 (including Legacy 600/650) fitted with Rolls Royce AE 3007 series engines was successfully concluded today at Star Air Training Facility.

A total 26 engineering candidates, 13 from Star Air, 11 from other MRO's and 2 DGCA officials participated in this training which was conducted from 6th of June 2022 to 27th of AUGUST 2022 spanning 52 days.

The training consisted of 28 days of intense theoretical elements conducted at Star Air Training Centre, Bengaluru and 12 days of practical elements conducted at Star Air Base Maintenance Facility at HAL Airport, Bengaluru.

This training will richly aid candidates in improving their competence and expertise in the maintenance which will in turn help boost the qualified skilled manpower on Embraer aircrafts in India.

■ PRATT & WHITNEY TO OPEN INDIA ENGINEERING CENTER IN 2023



Pratt & Whitney announces the establishment of a state-of-the-art India Engineering Center (IEC) in Bengaluru, India which is slated to commence operation in January 2023. The new center will focus on providing contract engineering services. The IEC is expected to employ 500 engineers and professionals when fully staffed.

"Pratt & Whitney's India Engineering Center will be a first-of-its-kind investment for our company in India," said Geoff Hunt, Senior Vice President, Engineering, Pratt & Whitney. "The IEC will help Pratt & Whitney leverage the engineering skills our future Indian workforce will deliver, as

Pratt & Whitney continues to advance the world's only fielded geared turbofan and develop sustainable propulsion for the next generation of propulsion."

As part of Pratt & Whitney's integrated global engineering operations, the IEC will work closely with centers in United States, Canada, Puerto Rico and Poland. The IEC has begun recruiting its first tranche of engineers and professionals.

"The IEC will allow us to synergize with existing Pratt & Whitney Operations' capabilities in India," said Paul Weedon, executive director, Engineering, Pratt & Whitney Canada.

The center will be co-located in Yelahanka, Bengaluru, with the existing Pratt & Whitney India Capability Center (ICC). The ICC is a world-class global supply chain support and operations center, established in 2022 as part of United Technologies Corporation India Pvt Ltd (UTC IPL), employing nearly 200.

"Pratt & Whitney's growth in the country represents our strong ties and deep respect for the skills India offers, skills needed for the future of aviation," said Ashmita Sethi, managing director of UTC IPL.

DJ Dalal and Rema Ravindran have been named as Pratt and Whitney's North American project director and general manager of the IEC, respectively.

The significant investments made in-country include Pratt & Whitney's state-of-the-art India Customer Training Center in Hyderabad; the R&D collaboration with the Indian Institute of Science, Bengaluru; as well as the ICC in Bengaluru.

■ AKASA AIR OPENS BOOKINGS FOR TICKET SALES ON 22ND AUGUST



Akasa Air has opened bookings for ticket sales of its first commercial flights with an initial network including Ahmedabad, Bengaluru, Mumbai, and Kochi. In the inaugural phase of its network development, Akasa Air will launch its operations by offering 28 weekly flights between Mumbai and Ahmedabad starting August 7, 2022. Following this, starting August 13, the airline will start operating an additional 28 weekly flights between Bengaluru and Kochi. All flights are open for sale with immediate effect.

Vinay Dube, Founder and Chief Executive Officer, Akasa Air said, "We are extremely excited to finally be able to offer up our flights for sale. We are also excited to reveal our product which promises to be unlike anything experienced in the category thus far. With Akasa employees providing warm and efficient customer service, a reliable and dependable network, and affordable fares - we look forward to serving our customers with a flying experience that I am sure they will find delightful".

Developing a strong pan-India presence Commenting on Akasa Air's network expansion plans, Praveen Iyer, Co-founder and Chief Commercial Officer, Akasa Air said, "Akasa Air's network strategy is focused on establishing a strong pan-India presence and providing linkages from metro to tier 2 and tier 3 cities across the country. We kick-start operations with flights between Mumbai and Ahmedabad, with the brand-new Boeing 737 MAX aircraft. We will adopt a phased approach to support our network expansion plans, progressively connecting more cities, as we add two aircraft to our fleet each month, in our first year".

Bookings for flights on Akasa Air will be available via the Mobile App, Mobile Web & Desktop website www.akasaair.com, through travel agents and several OTAs across the country. Customers can look out for fare specials being announced as the airline makes its foray into each new sector across the country.

Warm and efficient customer experience

Describing the experience that passengers flying with Akasa Air can expect, Belson Coutinho, Co-founder and Chief Marketing

and Experiences Officer, Akasa Air said, "We want to be a compassionate airline with a focus on being dependable, warm, efficient, and reliable. We will provide our passengers with category-first product choices and a happy travel experience which is tech-forward, inclusive, environmentally progressive – all in the Akasa way".

■ 41 ENTREPRENEURS FROM TRIBAL VILLAGES OF TAMIL NADU CHOOSE INDIGO FOR THEIR FIRST FLIGHT



In its endeavor to support social outreach initiatives, IndiGo, India's leading carrier supported by Isha Outreach flew 41 tribal folks from the foothills of Velliangiri, Coimbatore on their maiden air travel to Chennai today via IndiGo flight 6E 238. The group was felicitated at the airport by IndiGo staff, with a special welcome announcement in Tamil onboard the flight operated by Captain Pradeep Balasubramanian.

The entrepreneurs were supported by IndiGo ground staff and cabin crew to enable a hassle-free flying experience, from Coimbatore to Chennai. The group and the entire village were extremely elated to fly with India's most loved and reliable airline IndiGo.

Captain Ashim Mitra, Senior Vice President: Flight Operations, IndiGo said, "We are pleased to support this enterprising group for their first ever flight, enabling a memorable and seamless travel experience. We hope this trip and more in future, will help in expanding trade opportunities for their business with enhanced accessibility. We hope to continue to be their choice in future as well."

This enthused group of people are forest dwellers-turned-entrepreneurs whose lives have transformed since 2017 after the unveiling of the 112-foot Adiyogi by Hon'ble Prime Minister, which propelled their entrepreneurial journey as food stall owners near Adiyogi's iconic presence at the Isha Yoga Center. These travelers will be guided and accompanied by two Isha Foundation Brahmacharis (or monks) on this trip. As part of this exposure visit and excursion, they will be visiting several places in Chennai for business as well as leisure.

■ **VISTARA ENHANCES WELLNESS EXPERIENCE FOR ITS CUSTOMERS**



Vistara announced enhancements to the 'wellness experience' it offers onboard including addition of a host of relaxing audio-visual content to its in-flight entertainment offerings and introduction of amenity kits by Forest Essentials. These new additions, along with Vistara's new boarding and landing music, and healthy meal options, are aimed at giving a holistic wellness experience to customers onboard.

The airline has added over 17 hours of 'wellness-focused content' to its in-flight entertainment (IFE) system across its fleet. It includes tracks for guided meditations, soothing music, sleep-inducing stories, and more to help reduce common in-flight discomforts of its customers while elevating their overall flying experience. Powered by Shyft, a renowned health and wellness app, the exclusive content has been created and curated by certified professionals to

help passengers 'Feel the Pause' and fight fatigue, lack of sleep, stiffness of muscles, fear of heights and turbulence, anxiety, etc.

Vistara also announced that it will offer specially curated Forest Essentials' luxurious, ayurvedic 'wellness amenity kits' to business class customers on international, long-haul flights starting 01 August 2022. With natural, seasonal, pure, and fresh ingredients used to formulate products, the kits, along with 'Feel the Pause', are part of the conscious efforts Vistara is making towards offering a holistic, wellness experience to its customers on board.

Commenting on the update, Deepak Rajawat, Chief Commercial Officer, Vistara, said "We are excited to bring more elements of delight to our customers, and enhance their journeys. As we continue to find ways to elevate premium travel experiences, we are proud to become the first Indian airline to offer special 'wellness-focused' IFE content in partnership with Shyft, and partner with the home-grown luxury brand, Forest Essentials for exclusive amenity kits. We are sure that our customers will appreciate these enhancements, and these will become yet another reason for them to enjoy travelling with India's finest full-service carrier."

Pooja Khanna, Founder, Shyft said, "We're delighted to partner with Vistara to launch 'Feel the Pause' and bring our expertise in health and wellness to add to the wonderful flying experience. Shyft's videos for stretches, sleep stories, breathwork exercises and meditation will help flyers relax their body and mind, improve sleep and aid work."

Samrath Bedi, Executive Director, Forest Essentials said, "Today's traveller is looking for carefully curated and thought-out experiences that are distinct, while being efficacious. They are actively embracing purpose and sustainability-driven products, to support environmental causes. With the raised awareness around climate change, there has been a sharp rise in the demand for skincare and especially wellness products. Consumers are more selective and prioritise brands who value transparency and are purpose-led, something that has been inherent in the DNA of Forest Essentials since its inception, almost 20

years ago. Keeping this in mind, we have curated unique wellness offerings for the Vistara traveller, while coming together with another 'Made in India' brand, to offer a truly world-class experience."

■ **DELTA AIR LINES TO MODERNIZE SINGLE-AISLE FLEET WITH UP TO 130 BOEING 737 MAX JETS**



Boeing and Delta Air Lines announced the U.S. carrier will modernize its single-aisle fleet with the highly efficient 737 MAX to meet demand as well as its long-term sustainability goals. In a signing ceremony at the Farnborough International Airshow, the companies said Delta is ordering 100 737-10 jets – selecting the largest member of the 737 MAX family – with options for an additional 30 airplanes.

"The Boeing 737-10 will be an important addition to Delta's fleet as we shape a more sustainable future for air travel, with an elevated customer experience, improved fuel efficiency and best-in-class performance," said Ed Bastian, Delta's chief executive officer. "These new aircraft provide superior operating economics and network flexibility, and the agreement reflects our prudent approach to deploying our capital."

Most importantly, Bastian said, "This aircraft will be piloted, served and maintained by the very best professionals in the business, and it's their hard work and dedication to our customers that always sets us apart."

The 737-10 will provide Delta Air Lines with the best per-seat economics of any single-aisle Boeing model, reducing fuel use and emissions by 20-30 percent compared to the airplanes it replaces. The jet can cover 99% of single-aisle routes around the world, seating up to 230 passengers with a

maximum range of 3,300 nautical miles.

"We are proud that Delta Air Lines, is renewing its single-aisle fleet with the 737 MAX, the industry's most fuel-efficient family of airplanes," said Stan Deal, president and CEO of Boeing Commercial Airplanes. "Built in our factory in Washington State with support from key suppliers across the US, the 737-10 will provide Delta Air Lines with the best economics to carry more passengers across its short and medium-haul routes.»

VOLTAERO SELECTS SAFRAN'S ENGINEUSTM 100 ELECTRIC MOTOR TO EQUIP THE CASSIO 330 ELECTRIC-HYBRID AIRCRAFT PROTOTYPE



VoltAero's prototype Cassio 330 will utilize Safran Electrical & Power's ENGINeUSTM 100 smart electric motor in the aircraft's parallel electric-hybrid propulsion system, with the agreement for its supply signed at the UK's Farnborough International Airshow.

The ENGINeUSTM 100 will have a maximum rating of well above 150 kW at takeoff and is to be integrated along with a 150-kW thermal engine in VoltAero's proprietary hybrid propulsion unit on the Cassio 330. Features of the ENGINeUSTM 100 include an integrated motor controller and an optimized air-cooling system for thermal management.

Under terms of the agreement, Safran Electrical & Power will deliver an ENGINeUSTM 100 motor before year-end for ground-based endurance testing of the electric-hybrid propulsion system. The supply of a flight qualified

ENGINeUSTM 100 will follow in 2023, enabling the startup of flight testing with the Cassio 330 prototype. Certification of the electric motor is scheduled for mid-2023.

"This marks another important step toward the Cassio 330's first takeoff, initiating the certification program for our Cassio family of airplanes," said Jean Botti, VoltAero's CEO and Chief Technology Officer. "Cassio will benefit from the high-power density and proven technology that Safran Electrical & Power has applied in its ENGINeUSTM electric motor product line."

VoltAero will produce Cassio airplanes in three versions, each sharing a high degree of modularity and commonality. First to be certified is the Cassio 330, with a capacity of four/five seats and powered by the 330-kW electric-hybrid propulsion system. The follow-on six-seat Cassio 480 will have a combined electric-hybrid propulsion power of 480 kilowatts, while the Cassio 600 is sized at a 10/12-seat capacity with electric-hybrid propulsion power of 600 kilowatts.

The electric-hybrid propulsion system will be installed in the Cassio's aft fuselage, driving a pusher propeller. VoltAero's design for the Cassio aircraft family is based on a sleek, aerodynamically optimized fuselage, a forward canard, and an aft-set wing with twin booms that support a high-set horizontal tail.

Voltaero already has gained significant experience with ENGINeUSTM motors, having logged more than 10,000 km. since 2019 during flights with its Cassio 1 testbed aircraft – which incorporates two ENGINeUSTM 45 versions (rated at 45 kW of continuous power) installed on the wings.

"The ENGINeUSTM 100 agreement signed today extends our excellent partnership with VoltAero that began in 2019, and it reinforces our common vision for carbon-free aviation," stated Bruno Bellanger, Safran Electrical & Power's Executive Vice President and General Manager for Power division. "This is another success for our ENGINeUSTM range of engines, ideally positioned in the general aviation market for electric aircraft, and it represents a further step towards zero-emission airplanes."

BOOM SUPERSONIC AND COLLINS AEROSPACE SIGN EXPANDED AGREEMENT FOR MAJOR AIRCRAFT SYSTEMS FOR OVERTURE



Boom Supersonic, the company building the world's fastest airliner, optimized for speed, safety, and sustainability, announced today at the Farnborough International Airshow an agreement with Collins Aerospace on the Overture program. Carrying 65–80 passengers at twice the speed of today's airliners and running on 100% sustainable aviation fuel (SAF), Overture will fly Mach 1.7 over water with a range of 4,250 nautical miles.

Under the new agreement between the two companies, Collins will assist Boom in the evaluation and development of major aircraft systems and components for Overture. Engineers at Collins and Boom will perform aerodynamic analysis to evaluate Overture's Ice Protection System, the system that prevents the formation of ice on the aircraft during flight. Boom will also work with Collins to assess Air Data System architectures that meet Overture's field performance and range requirements.

"We are thrilled to be expanding our collaboration with Collins to develop key components for Overture," said Kathy Savitt, Boom's President. "This agreement leverages the deep expertise and scale of Collins as we ramp up for Overture production, and together we will work toward an aircraft that is fast, safe, and sustainable."

The expanded joint effort with Collins builds upon several years of successful collaboration aimed at improving propulsion system performance and

minimizing aircraft noise on Overture. Collins and Boom have worked together to develop inlet, nozzle, and exhaust system technologies to facilitate the net-zero carbon operation of Overture.

“Collins is capitalizing on decades of experience to provide key technologies for Overture that will play an integral role in making sustainable supersonic flight a reality for passengers,” said Colin Mahoney, president, Customer & Account Management for Collins Aerospace.

Today for the first time, Boom unveiled Overture’s refined design, combining a number of engineering innovations in aerodynamics, noise reduction, and performance at the Farnborough International Airshow. Boom also announced today that it would collaborate with Northrop Grumman to offer a special mission variant of Overture to government and military customers. The first Overture aircraft is on track to roll out in 2025, fly in 2026, and carry its first passengers by 2029.

■ ANA FINALISES PURCHASE AGREEMENT FOR 30 BOEING 737-8 AIRCRAFT



Boeing and ANA HOLDINGS, the parent company of All Nippon Airways (ANA), held a signing ceremony at the Farnborough International Airshow to formalize an order for 20 737-8 airplanes, with 10 options in addition to the airline’s selection of the new 777-8 Freighter. ANA is the first 737 MAX customer in Japan and first carrier in Asia to choose the 777-8 Freighter. The order was previously unidentified on Boeing’s Orders

and Deliveries website.

“We are pleased to partner with Boeing to introduce new airplanes into our world-class fleet that further our commitment to sustainable aviation,” said Koji Shibata, President and CEO of ANA HOLDINGS. “The efficiency, reliability and range capability of the 737 MAX make it an ideal airplane to refresh our narrow-body fleet and provide our passengers with the highest level of comfort onboard. In addition, the 777-8 Freighters will add flexibility and efficiency to our air cargo network. The 737 and 777 have long been a mainstay of the ANA fleet, and we look forward to continuing our partnership with Boeing with these new airplanes.”

“This is a tremendous milestone for ANA and Boeing as the airline has selected the 737-8 and 777-8 Freighter to further strengthen its passenger and cargo operations,” said Stan Deal, president and CEO of Boeing Commercial Airplanes. “ANA has remained at the forefront of commercial aviation by consistently investing in the latest airplane technology, providing their passengers with an unparalleled flying experience and more sustainable options to travel and deliver goods around the globe.”

■ CAE AND BOEING SIGN MOU TO ENHANCE GLOBAL AEROSPACE TRAINING, INNOVATION AND FLEET SUPPORT



CAE & Boeing signed a Memorandum of Understanding (MOU) to expand their collaboration and explore further teaming opportunities in defense aerospace training. The memorandum leverages the strengths, skills, and advanced technologies of Boeing and CAE with the intent to further enhance innovation and competition through

potential joint-offerings.

Additionally, the MOU aims to advance mission readiness for defense customer’s worldwide operating Boeing military aircraft. Working together, Boeing and CAE are uniquely qualified to deliver outcome-based pilot training, aircrew ground school, in-service support, and instructor training at the point of need.

“Boeing and CAE share an unwavering commitment to deliver value through innovative training solutions that provide increased efficacy and reliability to our defense and commercial services customers,” said Stephanie Pope, president and CEO, Boeing Global Services. “This collaboration demonstrates the best of how governments and industry can collaborate to benefit customers worldwide.”

This collaboration amplifies a long-standing relationship spanning commercial and defense portfolios across the globe. CAE is an integral partner on the CH-47 Chinook program in Germany, has supported Boeing extensively with P-8 training solutions worldwide, and is a charter member of Team Poseidon in Boeing’s Canadian Multi-Mission Aircraft offering. This MOU builds on the recent exclusive teaming agreement in Germany for Chinook, and continues joint efforts to deliver enhanced training offerings for Chinook in the United Arab Emirates that support Emiratization efforts, as well as expanding P-8 solutions in Canada, Germany, and Norway.

“Our purpose is to prepare our military customers for safe and successful mission outcomes through advanced training and mission readiness,” says Daniel Gelston, president, CAE Defense & Security. “CAE and Boeing are leveraging our global training experience and aircraft expertise to expand solutions that support modernization and adaptability for the future of these platforms.”



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HAL Signs Contract worth Over \$100 Million with Honeywell for HTT-40 Engines

HAL signed a contract worth over US\$100 million for supply and manufacture of 88 TPE331-12B engines/kits along with maintenance and support services to power the Hindustan Trainer Aircraft (HTT-40). The contract was exchanged by Mr. Eric Walters, Sr. Director OE Sales, Honeywell and Mr. B Krishna Kumar, Executive Director (E & IMGT) here in the presence of Mr. R Madhavan, CMD, HAL.

"HAL has successfully developed Basic Trainer Aircraft (HTT-40) to address the basic training requirements of the IAF. There is potential requirement of 70 aircraft. The contract for the same with IAF is under advanced stage of approval", said Mr. Madhavan.

"We are proud of our four decade long partnership with HAL and happy to extend our relationship with this new order," said Mr. Eric Walters, Senior Director OE Sales, Honeywell Defense & Space. "The TPE331-12 family of engines has proven itself in operations all over the world, and we have committed to support and deliver engines as well as kits within the stipulated schedule to meet the requirements of the IAF. Honeywell is committed to support export of HTT-40 aircraft in coming years along with other engine programmes which are currently on radar. This contract would pave the way for future collaboration between HAL and Honeywell.

The TPE331-12B engine is a single shaft turboprop engine with integral inlet and gearbox, two stage centrifugal compressor, power turbine, gearbox, three stage axial turbine and turbine exhaust diffuser as well as EEC for reliable power and outstanding operational characteristics.

The HTT-40 prototypes are powered by TPE331-12B engines and has been serving well since 2014. Entering into this 'Manufacturing & Repair license agreement for Honeywell TPE331-12B Turboprop engine' marks a major milestone in the execution of 70 HTT-40 aircraft contract with IAF. HAL is working closely with Honeywell for its support for export potential of HTT-40. HAL and Honeywell are exploring other areas such as 1MW Turbo Generators, manufacturing, Repair & Overhaul of TPE 331-10GP / 12JR engines for variants of Dornier.



Airbus and CFM International launch flight test demonstrator for advanced open fan architecture

Airbus and CFM International, a 50/50 joint company between GE and Safran Aircraft Engines, are collaborating to flight test CFM's cutting-edge open fan engine architecture.

The Flight Test Demonstrator aims to mature and accelerate the development of advanced propulsion technologies, as part of CFM's Revolutionary Innovation for Sustainable Engine (RISE) demonstration program, on board an Airbus A380. The flight test campaign will be performed in the second half of this decade from the Airbus Flight Test facility in Toulouse, France. Ahead of the A380 test flights, CFM will perform engine ground tests, along with flight test validation at GE Aviation's Flight Test Operations centre in Victorville, CA, USA.

The flight test program will achieve several objectives that could contribute to future engine and aircraft efficiency improvements, including: enhanced understanding of engine/wing integration and aerodynamic performance as well as propulsive system efficiency gains; validating performance benefits, including better fuel efficiency that would provide a 20%* reduction in CO2 emissions compared to today's most efficient engines; evaluating acoustic models; and ensuring compatibility with 100% Sustainable Aviation Fuels (SAF).

"New propulsion technologies will play an important role in achieving aviation's net-zero objectives, along with new aircraft designs and sustainable energy sources," said Sabine Klauke, Airbus Chief Technical Officer. "By evaluating, maturing and validating open fan engine architecture using a dedicated flight test demonstrator, we are collaboratively making yet another significant contribution to the advancement of technology bricks that will enable us to reach our industry-wide decarbonisation targets."

"The CFM RISE Program is all about pushing the technology envelope, redefining the art of the possible, and helping to achieve more sustainable long-term growth for our industry," said Gaël Méheust, President and CEO of CFM International. "CFM, its parent companies, and Airbus all share the same vision and commitment for the future; the open fan flight test demonstration program is an exciting next step toward achieving the industry's net-zero goals."



Pratt & Whitney Canada Delivers 1,000th PT6A-42A to Piper Aircraft in Advance of the Airframe Manufacturer's 85th Anniversary

Pratt & Whitney Canada, a business unit of Pratt & Whitney, announced that it has shipped the 1,000th PT6A-42A engine from its Lethbridge, Alberta, Centre of Excellence to Piper Aircraft in Vero Beach, Fla. Piper uses the engine model to power its ever popular, single-engine M500, M600 and now M600/SLS aircraft.

"This milestone delivery occurs almost 25 years after the certification of the PT6A-42A engine and, while every engine number is unique, the 1,000th engine speaks to the quality of the engine and how the PT6A family continues to shape general aviation around the world," said Nicholas Kanellias, vice president, General Aviation, Pratt & Whitney Canada. "The integration of an airframe with its engine is always critical. Piper's success with its single engine M500 and M600 series aircraft demonstrates that the match in this instance was certainly ideal."

Piper Aircraft was created in 1937 and has since delivered 137,000 small aircraft for business and pleasure. Approximately 880 of the single-engine Piper M500, M600 and M600/SLS have been delivered.

"The 1,000th PT6A-42A is a remarkable engine that arrives at a remarkable moment for Piper Aircraft as we prepare to celebrate the 85th anniversary of our founding," said John Calcagno, chief executive officer, Piper Aircraft. "The Piper community – thousands of aviation enthusiasts around the world – has elevated our single-engine, Pratt & Whitney-powered aircraft to iconic status and we accept this 1,000th engine in their name to recognize their loyalty to our product."

Known for its broad power range, dependability and proven performance in all flying conditions and environments, the PT6 turboprop engine family is in a class of its own, approaching 435 million flight hours, building upon the experience gained within the entire Pratt & Whitney Canada fleet at over 900 million flying hours. The PT6A engine has seen 120 enhancements made in the past 10 years alone. With more than 50,000 engines produced and more than 25,000 of them flying, the PT6 turboprop is the benchmark in reliability and is considered the most versatile turboprop engine in general aviation, which speaks to its dependable performance in single- and twin-engine aircraft.

"Piper has taken general aviation to new heights with its M500 and M600 series aircraft, so it is no surprise they remain a dynamic airframe manufacturer after 85 years," said Kanellias. "The company has built a strong reputation for product and service excellence. We are honored to count them as a time-tested collaborator."



Lufthansa Technik Aero Alzey: 30 Years of Support for the CF34 Engine

Lufthansa Technik AERO Alzey (LTAA) has two occasions to celebrate: The wholly owned subsidiary of Lufthansa Technik AG now counts 30 years of experience in the maintenance, repair and overhaul of CF34 engines – a type that mainly powers regional and business aircraft. In 1992, the first overhauled CF34-3 engines were redelivered in Alzey, the first engine type of the later CF34 series. The engine type has since then developed into a stable backbone in the service portfolio of the company: The CF34-8 was introduced in 2002, and the CF34-10 in 2011.

As one of the world's leading providers of repair and overhaul services for this type of engine, the company has been complementing the network of engine manufacturer General Electric (GE) for 30 years. During this time, the employees of LTAA have managed close to 2,000 shop events and more than 200 customers.

"Congratulations to LTAA on 30 years of supporting the CF34 program," said Cristina Seda-Hoelle, General Manager, Regional and Business Aviation for GE Aviation. "Our commitment remains strong in the continued investment of the CF34 engine line to keep supporting our customers in the regional and business aviation space. LTAA's technical capabilities and proven support fit well with GE's mission to provide superior engine service."

In addition, LTAA's employees can look forward to the expansion of their facilities: Due to the further growing demand, the construction of a new production building with 1,500 m² area is planned for mid-2023. This allows to create a production-related storage area for tools, modules and devices, which will enable four additional engine bays by repurposing hall space. It is also planned to hire more than 40 new employees with different specializations within the next two years.

"To have over 30 years of sustainable and innovative success with an engine requires a strong partner like GE on the one hand, and our excellently trained employees on the other," said Matthias Gruber, Managing Director of LTAA. "Their outstanding commitment as well as the cooperative partnership has allowed LTAA to shape and help develop the market over a long period of time. That is what makes me personally extremely proud of our company."

Rolls-Royce nearing completion of world's largest jet engine

Rolls-Royce has entered the final build phase for the world's largest aero-engine technology demonstrator, UltraFan®, providing a suite of technologies to support sustainable air travel for decades to come. The demonstrator engine, with a fan diameter of 140 inches, is being completed in Derby, prior to its first run – on 100% Sustainable Aviation Fuel – later this year. It offers a 25% fuel efficiency improvement compared with the first generation of Trent engine.

UltraFan supports a variety of sustainability solutions. In the nearer term, there are options to transfer technologies from the UltraFan development programme to current Trent engines to deliver even greater fuel efficiency and

reductions in emissions. In the longer term, UltraFan's scalable technology from 25,000-100,000lb thrust offers the potential to power new narrowbody and widebody aircraft anticipated in the 2030s.

UltraFan provides a platform for the use of a diverse range of energy options and power systems – including current jet fuel and sustainable aviation fuels as well as future potential for hybrid-electric and hydrogen.

Commenting on the announcement, Business Secretary, Kwasi Kwarteng, said:

"Rolls-Royce has long been synonymous with British excellence in engineering. Building the cutting-edge UltraFan demonstrator shows there's no sign of this reputation slowing down, with Rolls-Royce playing a central role in our plans to capitalise on the global shift to cleaner, fuel efficient flight.

"UltraFan, backed by the UK Government through the Aerospace Technology Institute Programme, is a major opportunity for growth and jobs for the UK. I look forward to seeing planes across the world powered by technologies developed in this ultra-efficient engine demonstrator for years to come."

Key engineering features of the engine include:

- A new, proven, Advance3 core architecture, combined with Rolls-Royce's ALECSys lean burn combustion system, to deliver maximum fuel burn efficiency and low emissions
- Carbon titanium fan blades and a composite casing
- Advanced ceramic matrix composite (CMC) components that operate more effectively at high pressures and temperatures
- A geared design that delivers efficient power for the high-thrust, high bypass ratio engines of the future. The power gearbox has run at 64MW, an aerospace record

When UltraFan is on test at Rolls-Royce's new £90m Testbed 80 facility, data can be taken from more than 10,000 parameters, detecting the tiniest of vibrations at a rate of up to 200,000 samples per second.





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ATR appoints Nathalie Tarnaud Laude as Chief Executive Officer



ATR announces that its Board Members, Airbus and Leonardo, have appointed the new Chief Executive Officer, Nathalie Tarnaud Laude, effective from 17 September. Nathalie succeeds Stefano Bortoli, whose four-year mandate expires at the same date, following the terms set by ATR's bylaws. Stefano will take on a new leadership role at Leonardo that will be announced by the company in the upcoming days.

Nathalie Tarnaud Laude is currently NHIndustries' President and Senior Vice President Head of the NH90 Programme for Airbus Helicopters. Prior to this, she held various senior positions at Airbus in strategy, programme, technology and finance. She brings strong strategic and leadership skills, as well as programme execution experience, essential to continue developing ATR as a leader in sustainable regional aviation. Nathalie joined Airbus in 2005 and holds a MBA from London Business School.

Nathalie Tarnaud Laude said: "I thank Stefano for his strong leadership in preserving ATR's market position and financial situation, while at the same time maintaining its highly skilled workforce in the unprecedented times of Covid, and preparing the grounds for the future of ATR. I am honored to join such an exceptional team of passionate and professional individuals, and I look forward to working with all ATR employees, existing and new customers, and our shareholders, to bring the company to the next heights. You can count on all my energy and enthusiasm to continue the ATR extraordinary success story."

flydocs appoints Mahendra Senapati as Finance Director for flydocs India



flydocs, the leading asset management solution provider for the aviation industry, announced the appointment of Mahendra Senapati as Financial Director for flydocs India. In the new role, Mahendra will support local leaders with decision-making, provide strategic financial partnerships to business leaders, and strategies to continually improve the effectiveness of the business, with a focus on understanding short and long-term financial plans.

Mahendra joins flydocs from Xiaomi Technology India, where he led the business finance, treasury, commercial, accounting, and audit verticals of the business. His previous roles also include Wipro Limited where he was the Business Finance Manager, as well as overseeing the auditing and risk management at Samsung R&D Institute India, a few years earlier.

Commenting on the appointment, Darren Yeates, Chief Financial Officer at flydocs said, "We are continuing to invest in our existing software solutions and technical services, and this new appointment significantly strengthens the flydocs India Leadership team. We are delighted to welcome Mahendra to the flydocs India team as the Finance Director, and we are certain that he will enhance the decision-making along with creating an environment to position finance as a valuable partner to the business. His professional experience in developing the finance function and aligning the Commercial team with the business will be an invaluable addition to our Leadership team. We're looking forward to working closely with Mahendra to support the existing skills within flydocs through analytical focus and effective leadership."

Mahendra Senapati, Finance Director at flydocs India said, "I am excited to start a new journey with flydocs and it is a privilege to be a part of the flydocs family. I am certain that this is going to be a great step forward in my career where I will use my decade-plus experience in various functions of finance. I am confident about delivering the best support to the business in driving its success and growth by contributing to strategic plans, financial re-engineering in the business model, and providing the best analytical inputs for the growth of the business. I look forward to collaborating with the Leadership team to meet our financial objectives and make flydocs profitable and sustainable."

Tufan Erginbilgic to succeed Warren East as Chief Executive Officer of Rolls-Royce Holdings plc.



Rolls-Royce the pre-eminent engineering company with focus on world-class power and propulsion systems, has announced the appointment of Tufan Erginbilgic as its new Chief Executive Officer in succession of Warren East who has earlier this year announced his intention to step down at the end of 2022.

Tufan, who has a background in engineering, has built his career in international business including over 20 years with BP, with five years as part of its executive team. In his last role before leaving in 2020, he led BP's downstream business, which included Refining, Petrochemicals, Service Station Network, Lubricants, Midstream operations and the Air BP jet fuel operation. During Tufan's tenure, the business was transformed, achieving record profitability and delivering record-setting safety performance. He has held several non-executive directorships in heavy industry and manufacturing companies, including at aerospace technology group GKN. He is currently a partner at Global Infrastructure Partners (GIP), a private equity firm which focuses on large-scale investments in infrastructure businesses and manages \$81bn for investors.

Anita Frew, Chair, Rolls-Royce, said: "I am delighted to announce the appointment of Tufan Erginbilgic as chief executive. He is a proven leader of winning teams within complex multinational organisations, with an ability to drive a high-performance culture and deliver results for investors. He has extensive strategic and operational experience and a firm understanding of safety critical industries, including aerospace, as well as the challenges and commercial opportunities presented by the drive for low carbon technologies. He has a strong track record for execution, delivery and the creation of significant value. I look forward to him building on the strategic foundations that Rolls-Royce has laid over recent years."

Tufan Erginbilgic said: "I am honoured to be joining Rolls-Royce at a time of significant commercial opportunity and strategic evolution as its customers embrace the energy transition. I am determined to deliver the full potential of the market positions which the company has built over many years, through its engineering excellence and innovative technology, and to build a platform for growth in order to create value for all stakeholders. I look forward to working with customers, partners and the Rolls-Royce team across the world on the next successful chapter for this iconic global engineering brand."

Bradley Carucci appointed as Managing Director of GA Telesis US SPAH Facility

GA Telesis Engine Services (GATES) recently announced that aviation industry veteran, Bradley Carucci, has joined GATES as Managing Director of the US-based Specialized Procedures Aeroengine Hospital (SPAH) in Wilmington, Ohio. This newly built 72,000 sq. ft. facility is a joint venture with GA Telesis, LLC and Air Transport Services Group, Inc. (ATSG).

Bradley Carucci, Managing Director, US SPAH said, "There were several reasons for joining GATES, but the one that stood out was the solid team of professionals. GA Telesis has always held the highest standards for customer service, and I am proud to be part of the team. This new capability enhances our support to airlines and lessors with quality engine maintenance while supporting their fleets."

Carucci brings a broad range of aviation experience with growth over time in the responsibilities assigned in the commercial aircraft maintenance industry. Bradley Carucci began his career as a Jet Engine Specialist with the United States Air Force. Carucci received his bachelor's degree in Applied Arts and Aviation Sciences from Eastern New Mexico University.

"We are excited to have Brad on the team. His prior experience in MRO Quality and Training Management will be of great value in establishing the operation. His knowledge of the industry brings us an extremely valuable competitive edge as we move forward into the future" said Russ Shelton, President, Engine Strategy Group.

ATR appoints Antonio Di Gennaro as Senior Vice President Finance & Chief Financial Officer



The ATR Board members appointed Antonio Di Gennaro as Senior Vice President Finance and Chief Financial Officer as of 1 July 2022. He brings with him over fifteen years' experience as a Finance and Operations business leader and joins ATR from PZL Świdnik, a Leonardo Helicopters company, where he was Chief Financial Officer and Member of the Management Board since 2018.

Prior to this, Antonio has held several international positions in the Aerospace & Defense Industry in both military and civil sectors. He has a strong background in Operations, Manufacturing, Customer Service & Sales, and business integration between cross cultural organisations. Antonio started his career at Alenia Aermacchi (merged in 2016 into Leonardo).

ATR welcomes Antonio to this new position where he will bring true added value in supporting the leading aircraft manufacturer in its innovations and continuous development and in its purpose to connect people and businesses in a responsible way now and in the future.

Dennis Kohr appointed new Head of Corporate Sales Asia Pacific



Dennis Kohr, Head of Corporate Sales Asia Pacific



Lufthansa Technik

As of August 1, Dennis Kohr will become Head of Corporate Sales Asia Pacific for Lufthansa Technik Group. He succeeds Thomas Böttger, who became Head of Purchasing in March this year.

Dennis Kohr, currently "Head of Product Sales & Fulfillment Open Loop, EMEA", previously held several leading positions in Sales and Customer Service, also outside the Lufthansa Group. After joining Lufthansa Technik in 2006 as a project manager in Component Sales, his professional career led him to Jet Aviation, among others, first to Switzerland as Director Sales and Customer Support and later to Austria as Accountable Manager. After eight "non-Lufthansa" years, Dennis Kohr returned to Lufthansa Technik in 2018 as Head of Product Sales EMEA (Europe, Middle East, Africa) in the Component division.

"I am looking forward to the exciting new task of further expanding Lufthansa Technik's market share in APAC together with my colleagues in the APAC sales team and in cooperation with all product segments, and to carry the "voice of the customer" from Asia to Hamburg. As local travel restrictions are further eased, the goal is to successfully position Lufthansa Technik in this trend-setting growth phase. On a personal level, I am also excited to get to know Lufthansa Technik even better in all its product diversity," says Dennis Kohr.

Dennis Kohr completes Lufthansa Technik's corporate sales senior leadership team, consisting of Kai-Stefan Roepke, who is responsible for EMEA (Europe, Middle East and Africa) and Georgios Ouzounidis, who is heading the sales activities for the Americas region.



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Aviation Update Editor Kartikeya In conversation with
Mr. Savyasachi Srinivas
Executive Director, GETC - India, Collins Aerospace

Tell us about your aviation career?

I have global work experience in aerospace and defense corporations in the United States and India, where I have led cross-functional and geographically diverse teams in the development of large-scale systems for mission critical applications in aerospace, aviation, and other engineering domains.

I started my career as a systems engineer at Lockheed Martin in the U.S. in roles of increasing responsibility leading functional and program teams that supported the development and deployment of large-scale ATM and other mission-critical systems., I later moved to India and joined Thales as director of engineering supporting platforms in avionics, cabin systems, ATM, and Information & Technology. I joined Rockwell Collins, now Collins Aerospace, in 2013 as the director of the India Design Center supporting all business units in multiple domains. I later held the role of

senior director of Asia Pacific engineering, leading sites in India, Australia, and Singapore. Currently, I lead the engineering organization in India for Collins Aerospace's Bangalore and Hyderabad locations.

India is gradually emerging as the fastest growing aviation industry and MRO hub. What kind of opportunities do OEM companies like Collins Aerospace expect to come by?

India is one of the largest markets for both civil and defense segments. This presents a great opportunity for Collins Aerospace; we think we are uniquely positioned to tap into these opportunities being the largest private aerospace and defense company with approx. 5000 people in engineering, operations, supply chain and business development in the country.

There are four major thrust areas where we are currently developing our plans: 1. Establishing MRO in India for our key product lines, 2. Supporting Airlines and

Airports in India with their modernization plans for Air Traffic Management and Airport Management respectively, 3. Contributing to the sustainment of active fleet and development of indigenous defense ecosystem on flagship programs such as LCA, AMCA, Saras Mk-II & IMRH, and 4. Partnering with the Indian Government, academia, and start-ups to further Aerospace and Defense-related research and development.

What are the new technologies emerging in the aviation industry and how is it helping players increase their efficiency in the hyper-competitive industry?

The aviation industry is going through a rapid transformation with the evolution of new-age technologies like AI/ML, AR/VR, Computer vision, Data Analytics, wireless, and 5G for increased autonomy while expediting the design life cycle. Hybrid electric aircraft or electric aircraft, UAVs, UAS, and Drones demand innovation



in battery technologies in addition to the implementation of the above-said technologies. This is helping reduce carbon footprint. Additive manufacturing and Advanced materials are helping make aircraft lighter and tougher.

AI/ML, AR/VR, Robotics, and Data Analytics will have a huge impact on 10X improvement in the manufacturing process and MRO operations which are aimed to benefit our customers in the same proportionality.

Which are the domains Collins Aerospace is currently focusing on and what will be their contribution to your overall growth?

At Collins Aerospace, we are into every aspect of Aircraft design. More than 70% of all major platforms carry our innovative products, technologies, and solutions. In our effort to redefine the future of Aerospace, our focus include Digital, Electric Aircraft Architecture, Additive manufacturing, Advanced materials, Connected Aviation, Connected cabin, and Advanced technologies for Avionics. All these areas are the future of the Aerospace industry which impacts the bottom-line of our business.

and it allows us to be more innovative and ensures our sustenance, growth, and staying ahead of the competition. New domains/ technologies make the process and system more agile, more safer and more affordable to our customers. This is what our stake owners expect from us

What are the main challenges you are facing and how do you propose to overcome them?

India has the world's sixth-largest economy and is an emerging market across many industries, and we are pushing steadily toward sustainability, self-reliance, and a well-developed workforce.

Our teams are exploring various systems and capabilities related to the connected aviation ecosystem -- including aircraft connectivity, touchless airport technologies, the application of artificial intelligence, machine learning, augmented and mixed reality, system autonomy, and data analytics. These areas of innovation are striving to keep pace with the rapidly growing Indian aerospace market and will be key in achieving self-reliance for India in aviation. One of our key challenges is the upskilling of talent to ensure that we can support and

develop solutions in anticipation of these changes and meet customers' evolving requirements. Another challenge is working across our enterprise and the industry at large to grow the aerospace ecosystem through partnerships and collaboration, and I think with the expertise at Collins Aerospace and the other Raytheon Technologies businesses, we can effectively collaborate with the Indian government to bring in best-of-class solutions to grow the aerospace ecosystem. Not only for India but also for the rest of the world.

What are some near future goals that you want to reach with Collins Aerospace as a brand?

First off, we want to be the industry's employer of choice and we've grown our presence in India to over 5,000 employees since our establishment in 1997 and are aiming to almost double that over the next few years. Collins strongly values diversity, equity & inclusion and we believe in a culture where our employees, customers, and communities see themselves in what we do and how we do it. We want to ensure our people feel represented and know that they have equal opportunities to be their best and do their best. We also want to maintain



our lead in cutting-edge work. As one of the largest exporters of aerospace products from India, our talented team has produced over 400 patents and won a variety of technology awards that cover inventions across all Collins strategic business units and functions. We are looking to accelerate to meet customer demands through innovation and collaboration, such as working with the local academia to provide insights and ideas to solve local challenges. We have collaborated with premier Indian research institutes such as the Indian Institute of Science (IISc), the Indian Institute of Information Technology (IIIT), BITS Pilani, public sector units and government research agencies, and a few start-ups in Hyderabad and Bengaluru. We see significant opportunities to collaborate with T-hub and explore increased tie-ups with start-ups.

What are your expansion plans and how is the program performing?

We will expand our presence and consolidate engineering space at our new Collins Global Engineering and Technology Cent (GETC) located at Northgate Tech Park in Yelahanka. India is an important and strategic market for Collins Aerospace and we will continue to invest here. More than 2,000 engineers are expected to move from various office locations throughout Bangalore into the new center, and plans are in place to hire an additional 1,000 engineers by the end of 2022. The state-of-the-art building has been designed for sustainability with a U.S. Green Building Council (USGBC) Platinum Rating, solar power capabilities, zero water discharge facilities, and other features. Having all of our engineers and engineering talent under one roof in India will promote even better collaboration across our departments and businesses and accelerate the innovation and development of solutions for our customers. India has a huge talent pool, and we look forward to expanding our team and capabilities to drive growth in the aviation and defense sectors.

If you could change one thing in aviation tomorrow, what would it be and why? -

As the world faces the realities of climate change and emerging from the COVID-19 pandemic, the aviation industry is focused

on sustainably redefining air travel and Collins Aerospace joins other key players in our industry with the Air Transport Action Group's (ATAG) proclamation to Fly Net Zero by 2050 goal to achieve net-zero carbon emissions by 2050 for global civil aviation operations. We are uniquely positioned to lead impactful advancements in sustainable solutions and practices based on our breadth and depth of capabilities across the platform lifecycle value chain and global footprint in aerospace and defense. Internally, we are creating a culture of sustainability at Collins Aerospace through our Sustainability Task Force, and we believe that a collaborative industry approach is required to drive these changes – including customers, employees, suppliers, shareholders, and communities. We are also asking new questions and looking at the work we do differently to build on that foundation through:

- Collaboration: Inspiring our people, communities, customers, and industry to work together
- Research & Development (R&D): Investing in R&D to pioneer more

sustainable technology

- Products & Technology Roadmap: Innovating safer, smarter, more resilient solutions
- Environmental Impact & Industrial Roadmap: Driving resource-efficient practices in aviation

What is your advice to youngsters who wish to choose aviation as their career?

As an engineer working in aviation, you'll have the opportunity to work on innovative, mission-critical projects that push the boundaries of what engineers can do. An engineering career is a career on the cutting edge, one that is redefining our industry as we make significant investments in our strategic initiatives and create the next generation of new products and services that enhance our customers' experiences and allow them to reach new heights. Our 16,000 engineering team members across more than 300 sites around the world with an accumulative 18,000 patents earned would certainly think so!



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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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**AVIATION
UPDATE**

AAI signs agreement with Govt. of Uttar Pradesh for Operation & Management of Aligarh, Azamgarh, Chitrakoot, Muirpur, Shravasti Airports

Airports Authority of India (AAI) signed an Operation & Management agreement for operationalization of five airports owned by the Government of Uttar Pradesh for a period of 30 years. These five airports are Aligarh, Azamgarh, Chitrakoot, Muirpur & Shravasti.

The agreement was signed by Shri N V Subbarayudu, ED (SIU) on behalf of AAI and Sri Kumar Harsh, Special Secretary, Civil Aviation Department, Government of Uttar Pradesh on behalf of the State Government in presence of Shri Yogi Adityanath, Chief Minister, Government of Uttar Pradesh. The MoU was exchanged by Shri Sanjeev Kumar, Chairman AAI and Shri SP Goyal Additional Chief Secretary, Uttar Pradesh. Shri D S Mishra, Chief Secretary of UP, Shri AK Pathak, Member Planning (AAI) were also present.



As per the agreement, AAI will operate and manage the airports and provide all necessary services. Communication Navigation Surveillance/ Air Traffic Management (CNS/ATM) services will also be provided by AAI, for which State Government will enter into a separate agreement. Further, Reserved Services will be provided by respective Gol for which GoUP shall enter separate Memorandum of Understanding (MoU) with Ministry of Civil Aviation (MoCA), Gol. AAI will also be responsible for obtaining and maintaining of aerodrome license for these five airports.

New Goa International Airport successfully completes Instrument Landing System (ILS) calibration

GMR Goa International Airport Limited (GGIAL), a subsidiary of GMR Airports Limited (GAL), has successfully completed calibration of the Instrument Landing System (ILS) for the newly built Runway 28 of the upcoming New Goa International Airport, yesterday.

A special aircraft from AAI, Flight Inspection Unit (FIU) equipped with the analyser and ILS equipment signal tracker completed its technical observations and fine-tuning of the equipment.

With this, the upcoming New Goa International Airport has achieved a significant milestone. Subsequently, the Instrument Flight Procedures (IFP) will be flown and validated by a commercial airline, which once formally approved by DGCA will give a go-ahead for the commercial pilots to fly on that procedure. IFP is developed considering various factors including the terrain, obstacles in the surroundings etc. for the execution of a safe landing.

Speaking on the occasion, CEO-GGIAL, Mr. R. V. Sheshan said, "Today, we have successfully completed ILS calibration. This ensures precise and safe landing of aircraft. This is a major step forward towards making the new airport commercially operational. As an airport operator, GGIAL is constantly working to make New Goa International Airport, the airport of choice for airlines & fliers by unlocking the true potential of Goa. New Goa International Airport will offer a plethora of employment & tourism opportunities promoting socio-economic development in Goa."

ILS is an essential navigation aid to help pilots land their aircraft in low visibility conditions during IFR (Instrument Flight Rules) flights. ILS is used to provide accurate azimuth (compass bearing) and descent guidance signals to aircraft for landing on the runway under normal or adverse weather conditions. This system can assist an aircraft to land at a Runway Visual Range (RVR) as low as 550 m.

This ILS calibration process is carried out by FIU Aircraft which is equipped with an Automatic Flight Inspection System (AFIS). The independent dual receiver configuration of the system ensures very high integrity and repeatability of the testing/calibration results. This FIU aircraft which conducts ILS calibration is operated by pilots and engineers of the AAI.



AAI has undertaken installation of night landing facility at Kolhapur airport

The upgradation/modernisation of airports, including provision of night landing facility is a continuous process and is undertaken by Airports Authority of India (AAI) and other airport operators from time to time depending on the availability of land, commercial viability, socio- economic considerations, traffic demand / willingness of airlines to operate to/from such airports etc.

Presently night landing facility which is purely demand and need based on operational requirement of airlines and availability of land is not available at 25 operational airports with scheduled flight operations as indicated in the Annexure.

AAI has undertaken installation of night landing facility at Kolhapur airport. A team of Directorate General of Civil Aviation (DGCA) has carried out the inspection of the airport on 10th June, 2022. AAI has already initiated action for compliance of the observations made by DGCA during the inspection.



Hon'ble PM inaugurated Deoghar Airport along with various infrastructure and development projects in Jharkhand

Prime Minister Narendra Modi inaugurated the newly-constructed airport at Deoghar in Jharkhand. Union Aviation Minister Jyotiraditya Scindia and Jharkhand Chief Minister Hemant Soren will also be present on the occasion.

With this, Deoghar will be connected to Kolkata, Patna and Ranchi under the government's 'UDAN' regional connectivity scheme. These routes are being operationalized in collaboration with Ministry of Tourism, a Civil Aviation Ministry statement said. Deoghar Airport will be the 68th destination to be connected to Kolkata, Patna and Ranchi under UDAN. An IndiGo connecting Kolkata and Deoghar took off. Connectivity to Patna and Ranchi will be achieved soon.

Sanjay Kumar, chief strategy and revenue officer, IndiGo, said, "We are pleased to announce Deoghar as the 74th destination on the 6E network. These new flights will enhance connectivity and significantly reduce transit time between Kolkata and Deoghar, from 7.5 hours to less than 1.25 hours."

The Deoghar airport is spread over 657 acres has a 2,500-metre-long runway, which can handle the landing and takeoff of Airbus A320 planes. The airport has a 5,130 square feet terminal building and six check-in counters that can serve 200 passengers at a time.



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AVIATION UPDATE



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Boeing F/A-18 Super Hornet Successfully Completes Operational Demonstrations in India

Boeing's F/A-18 Super Hornet successfully completed operational demonstration tests at Indian Naval Station Hansa in Goa, India, and reinforced the Super Hornet's ability to effectively and safely operate off Indian Navy carriers.

Two U.S. Navy F/A-18E Super Hornets completed multiple ski-jumps, roll-in and fly-in arrestment, as well as performance flights, in a variety of weights in the air-to-air, air-to-ground, and air-to-surface configurations, meeting the Indian Navy test requirements.

"The Boeing team was privileged to showcase the F/A-18 Super Hornet's compatibility with Indian carriers in Goa," said Vice President, India business development Boeing Defense, Space & Security and Global Services, Alain Garcia. "As the premier frontline multi-role naval fighter, the F/A-18 Super Hornet is one of the world's most proven and affordable multi-role fighters and continues to evolve with the development of the next-generation Block III capability which will be game-changing for India."

"With the Super Hornet Block III, the Indian Navy would not only get the most advanced platform but would also benefit from tactics, upgrades and knowledge related to the naval aviation ecosystem that the U.S. Navy offers," he added.

The tests followed eight ski-jumps in various weights and configurations during previous tests held at Naval Air Station (NAS) Patuxent River in Maryland in late 2020 that demonstrated the Super Hornet's ability to operate from a short take-off but arrested recovery (STOBAR) aircraft carrier.



Northrop Grumman Successfully Identifies Modern Threats during Advanced Missile Flight Test

Northrop Grumman Corporation successfully completed the third captive flight test of its prototype missile development series. The internally funded air-launched missile demonstrates capabilities relevant for multiple services, missions and platforms.

Completed at the Naval Air Weapons Station China Lake, California, the internally funded test successfully validated the capability to identify and discriminate modern, integrated air defense systems and successfully tracked the intended targets during a series of captive flight maneuvers using the company's test aircraft.

The missile is designed to target enemy air defense systems while providing forces the freedom of maneuver to complete a mission out of harm's way. The design leverages the company's existing work under the U.S. Navy's AGM-88G Advanced Anti-Radiation Guided Missile-Extended Range (AARGM-ER), including engineering manufacturing and development, low-rate initial production and integration work for F-35 aircraft. To adapt to ever-changing threats, the missile design features open architecture interfaces that will allow for rapid subsystem upgrades to field enhanced capabilities to the warfighter.

"By merging our weapons expertise and internal investments with our digital engineering proficiency, we are rapidly delivering advanced missile capabilities," said Mary Petrysyn, corporate vice president and president, Northrop Grumman Defense Systems. "This formula supports our strategy to design, test and deliver technologically advanced capabilities ahead of schedule."

By harnessing in-house digital engineering expertise from across the company, including established programs with the U.S. Air Force, U.S. Space Force, U.S. Navy, U.S. Army and NASA, Northrop Grumman is accelerating development and build of its internally funded missile solution, and will be ready to begin live fire testing during 2022.

The company is planning additional flight tests this year in more stressing scenarios that are relevant to all programs leveraging the AARGM-ER program.



Boeing Integrates Eagle Passive Active Warning and Survivability System onto U.S. Air Force F-15s

The first two U.S. Air Force F-15E aircraft recently began Eagle Passive Active Warning and Survivability System (EPAWSS) modification at Boeing. Forty-three F-15Es will receive EPAWSS, which is also the electronic warfare system that will equip the F-15EX Eagle II.

Developed, produced and integrated by the strong partnership between Boeing and BAE Systems, EPAWSS represents a transformational overhaul to the survivability of the F-15 by providing advanced capabilities to detect and counter ground and airborne threats while also improving battlefield situational awareness.

“The Eagle Passive Active Warning Survivability System makes the most of mission effectiveness and survivability for the F-15 in contested environments, and further strengthens a highly capable, lethal aircraft,” said Prat Kumar, vice president of F-15 Programs. “With EPAWSS, the F-15E and F-15EX have successfully proven they can perform across a large force environment to penetrate advanced enemy air defenses and improve mission flexibility.”

In May 2021, the first two F-15EX aircraft, delivered ahead of schedule, participated in Northern Edge exercises with the EPAWSS suite. During the highly contested and complex exercises, the two jets demonstrated operational potential, which set the stage for future incremental improvements, allowing the jets to exhibit proven, outstanding performance in subsequent exercises and flight test missions in October 2021 and February 2022.



‘Aatmanirbhar Bharat’: iDEX-DIO signs 100th contract for defence innovation.

iDEX (Innovations for Defence Excellence), the flagship initiative of the Department of Defence Production, Ministry of Defence, ceremoniously embarked upon the milestone of signing its 100th contract on 26 July 2022.

iDEX framework was launched by Hon’ble Prime Minister Shri Narendra Modi in 2018 with the objective that it would provide the platform of co-creation and co-development in the Defence sector, and would engage start-ups to contribute to the defence sector and develop defence and aerospace setup in the country. iDEX is being implemented by Defence Innovation Organisation (DIO), established under Department of Defence Production, Ministry of Defence.

Within a short span of time iDEX, which has also been awarded the prestigious Prime Minister Award for Public Policy in Innovation Category for the year 2021, has emerged as a game changer in the Defence eco-system through its flagship programmes like Defence India Start-up Challenges (DISC), Prime and Open Challenges (OC). iDEX has been able to build the required momentum and generate critical mass of start-ups in the defence sector.

Today, the 100th contract was signed by Additional Secretary (Defence Production) and CEO, DIO Shri Sanjay Jaju with CEO Pacify Medical Technologies Pvt Ltd Shri Saiprasad Poyarekar. The occasion was graced by Defence Secretary Dr Ajay Kumar and Vice Chief of Army Staff Lt Gen BS Raju. Speaking on the occasion, Dr Ajay Kumar said, “We are confident that iDEX will make India the biggest Defence Innovation Ecosystem in the world. For this, I would like to thank the tireless and continuous efforts and support from all the stakeholders, including the Services, the start-ups, partner incubators and the iDEX team.”

Till date, iDEX has launched iDEX Prime, seven rounds of DISC (including DISC SPRINT) and five rounds of OC, receiving more than 4,000 applications from individual innovators, MSMEs and start-ups. More than Rs 250 crore worth of projects have been allocated and procurement of 14 items worth over Rs 400 crore have been cleared. iDEX has also been able to generate thousands of jobs and attract India’s talent back to the country.

In the last four years, 17 start-ups in 14 projects have already been accorded the Acceptance of Necessity (AoN) by Defence Acquisition Council (DAC) for trial and procurement in March 2022. Projects from balance of DISC 1 & 2 and some from DISC 3 are nearing completion and may be accorded AoN by DAC by end of current Financial Year.

GA-ASI SeaGuardian Supporting RIMPAC 2022

An MQ-9B SeaGuardian® Unmanned Aircraft System from General Atomics Aeronautical Systems, Inc. is under contract with the U.S. Navy to support the Rim of the Pacific (RIMPAC) 2022 exercise. RIMPAC, the world's largest international maritime exercise, started in late June and continues until early August in Hawaii and Southern California operations areas.

GA-ASI's SeaGuardian is a maritime derivative of the MQ-9B SkyGuardian® and remains the first UAS that offers multi-domain Intelligence, Surveillance, Reconnaissance and Targeting (ISR&T) as an internal payload that can search the ocean surface and the depths in support of Fleet Operations. The UAS is also providing real-time ISR data feeds to the U.S. Pacific Fleet Command Center using Signals Intelligence (SIGINT) parametrics and full-motion video to the watch floor and intelligence centers for real-time, dynamic tasking.

As of July 25, 2022, 11 flights totaling over 80 hours have been flown by SeaGuardian showcasing all operational payloads, which includes Electronic Intelligence (ELINT), Communication Intelligence (COMINT), Automatic Identification System (AIS), Anti-Submarine Warfare (ASW) monitor and control of sonobuoys, GA-ASI developed Lynx® Multi-mode Maritime Radar, high-definition Electro-Optical/Infra-Red (EO/IR) imaging system and Link 16.

SeaGuardian's multi-domain capabilities allows it to flex from mission to mission and pass real-time sensor data directly to the Fleet through Link 16 and satellite feeds to the shore-based command and intelligence centers. During RIMPAC, the MQ-9B has effectively passed ISR&T information to various surface and air units, such as the USS ABRAHAM LINCOLN, Guided Missile Destroyers, Littoral Combat Ships, frigates, patrol boats, P-8s, P-3s and a litany of other U.S. and foreign units taking part in the exercise.



Raytheon Missiles & Defense, Northrop Grumman complete second hypersonic weapon flight test

Raytheon Missiles & Defense, a Raytheon Technologies business, in partnership with Northrop Grumman successfully completed its second flight test of the scramjet-powered Hypersonic Air-breathing Weapon Concept, or HAWC, for the Defense Advanced Research Projects Agency and the U.S. Air Force.

This flight test applied the data and lessons learned from the first flight to mature the operationally relevant weapon concept design. The test met all primary and secondary objectives, including demonstrating tactical range capabilities.

"The test demonstrated how we've rapidly matured affordable scramjet technology, which is the basis for air-breathing weapons," said Colin Whelan, president of Advanced Technology for Raytheon Missiles & Defense. "Our second HAWC flight test success is an important milestone for our nation as we advance hypersonic systems."

During the flight test, after releasing HAWC from an aircraft and accelerating to hypersonic speeds using the scramjet engine, the vehicle flew a trajectory that engineers designed to intentionally stress the weapon concept to explore its limits and further validate digital performance models. These models, grounded in real-world flight data, are being used to accurately predict and increase performance as the system matures.

"The second flight test is a big step toward scramjet technology being mission ready," said Dan Olson, vice president and general manager of Weapon Systems for Northrop Grumman. "Nearly twenty years of scramjet propulsion research and development have come to fruition to significantly advance our nation's weapon capabilities."

Scramjet engines use high vehicle speed to forcibly compress incoming air before combustion to enable sustained flight at hypersonic speeds – Mach 5 or greater. The system was designed to use a widely available hydrocarbon fuel, and since it uses air for combustion, it does not have to carry the added weight of an onboard oxidizer. These key attributes allow for a safe, efficient, and tactically sized, long-range hypersonic weapon. By traveling at these speeds, hypersonic weapons like HAWC can reach their targets more quickly than traditional missiles, allowing them to potentially evade defense systems.

Raytheon Missiles and Defense and Northrop Grumman have been working together since 2019 to develop, produce and integrate Northrop Grumman's scramjet engines onto Raytheon's air-breathing hypersonic weapons. Their combined efforts enable both companies to produce air-breathing hypersonic weapons, the next generation of tactical missile systems.



Indian Navy receives two MH 60R multi-role helicopters from United States

The Indian Navy received two MH 60R multi-role helicopters from the United States at the Cochin International Airport. The copters were delivered by the Special Air Assignment Mission Flight of the US Air Force.

The helicopters were part of the 24 MH 60 R Multirole helicopters being procured by India from the United States at a cost of over 14,000 crore rupees. The first three helicopters delivered last year in the US are being utilized for training the Indian Navy crew. Another helicopter is scheduled to be delivered on the 22nd of next month.

These helicopters will be initially based at the Naval Air Station INS Garuda in Kochi and will be put through intensive flying trials for integration into the Navy's fleet operations.

The delivery of all the 24 MH 60 R multirole helicopters will be completed by 2025. The induction of these helicopters will significantly boost the integral Anti-Submarine Warfare capability of the Indian Navy.



Artificial Intelligence (AI) Centre of Excellence (Coe) launched by IAF

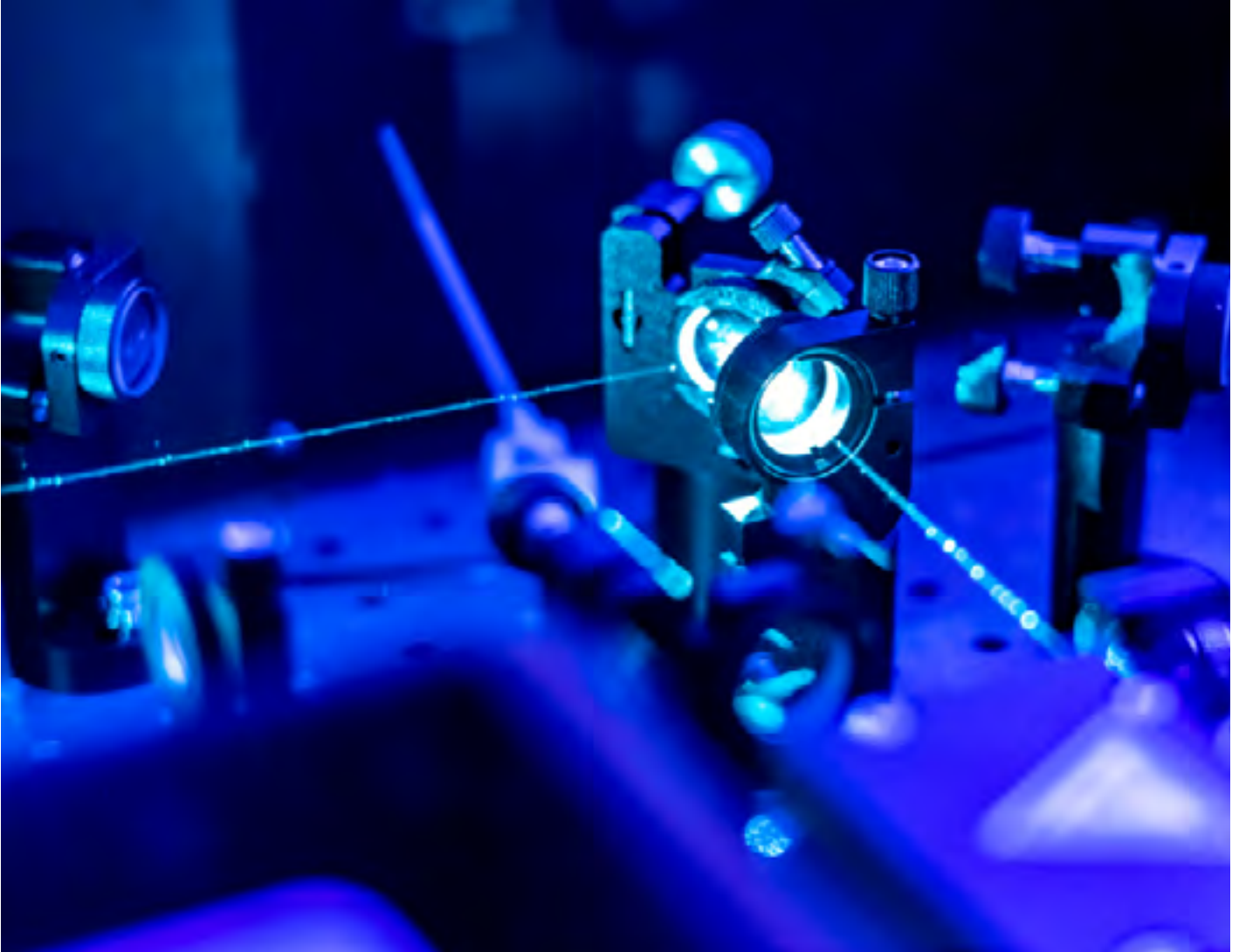
The IAF Centre of Excellence for Artificial Intelligence under the aegis of UDAAN (Unit for Digitisation, Automation, Artificial Intelligence and Application Networking) was inaugurated by Air Marshal Sandeep Singh, Vice Chief of the Air Staff (VCAS), on 10 July 2022 at Air Force Station Rajokri, New Delhi.

A Big Data Analytics and AI Platform has been commissioned in the IAF's AI Centre, for handling all aspects of Analytics, Machine Learning, Natural Language Processing, Neural Networks and Deep Learning algorithms. The high-end compute requirements would be undertaken by the latest Graphical Processing Unit powered servers.

Addressing the gathering, VCAS said that IAF has taken proactive steps to embed Industry 4.0 and AI based technologies in its war fighting processes. He reiterated that the AI COE with high end compute and big data storage capabilities, coupled with full spectrum AI software suites, would substantially enhance operational capability of IAF. The AI based applications are being developed with inhouse expertise in coordination with various PSUs, MSMEs and leading academia in the field of Artificial intelligence.



Future of Lasers and Laser Protection Technology



The advent of lasers has brought a revolution in global technology, owing to their multi-dimensional characteristic nature. The very fact that uncontrolled lasers, on one hand, cause irreversible damage to the eyes but if rightly controlled, are also capable of performing critical eye surgeries reveals the ability of lasers to operate in a broad range.

Over the years, the true potential of lasers has been realized through their expanding capabilities from high-end lab experiments such as optical tweezers and laser cooling of atoms to day-to-day operations viz., laser

barcode scanners and laser engravings. Lasers are used in many applications from research and defence to medical instruments.

In the field of medicine, lasers are used to treat specific areas of tissues and complete cosmetic surgeries. In the manufacturing industry, lasers are used to cut through materials with high precision and are also used in additive manufacturing procedures to improve precision in 3D printing. Even in military operations, laser-based warfare is the advanced mode of attack adopted.

Lasers unlike conventional light, possess

high intensity, coherence, directionality and monochromaticity. They don't diverge with respect to the distance travelled, whereas conventional sources do. Thereby, the maximum power of the laser can be transferred over large distances. Hence, a large amount of energy is concentrated on the spot size and achieves high power densities.

As lasers are operated by humans, there are possibilities of reflections can damage vision permanently. Unintentional heat can vaporize skin tissue or cause retina lesions and skin burns. Therefore, reducing the laser

intensity that enters the eye is vital. The severity of lasers can be imagined as a man can see a 100W tungsten bulb glow with little discomfort however, laser light with <1W of power can damage vision without intimation.

As laser technology is growing and has adverse effects on humans, there is a high demand for laser safety equipment. Lasers are classified into four types, 2M, 3R, 3B and 4 based on their power intensity. Laser protective eyewear and solutions are in high demand in the field of science and technological advancement. In conventional applications, three types of laser goggles are in use, 1) polycarbonate filters 2) absorption glass, and 3) dielectric filters and coatings. One form of laser protection is through laser safety coatings or filters done through thin film depositions. The filter deposited on the goggles blocks specific laser wavelengths and transmits the visible region of the electromagnetic spectrum through it (VLT-visible light transmission). Optical Density (OD) is the attenuation factor of a filter at a specific wavelength. For better understanding, 100%, 10%, 1%, 0.1% & 0.0001% in transmission scale equals 0, 1, 2, 3 and 6 in OD scales respectively, commonly used for denotation purposes.

Polycarbonate filters work from low to mid-power density lasers and absorption glass reduces VLT. The dielectric filter or coating has an advantage over these two solutions by blocking specific laser wavelengths and transmitting visible light through them in

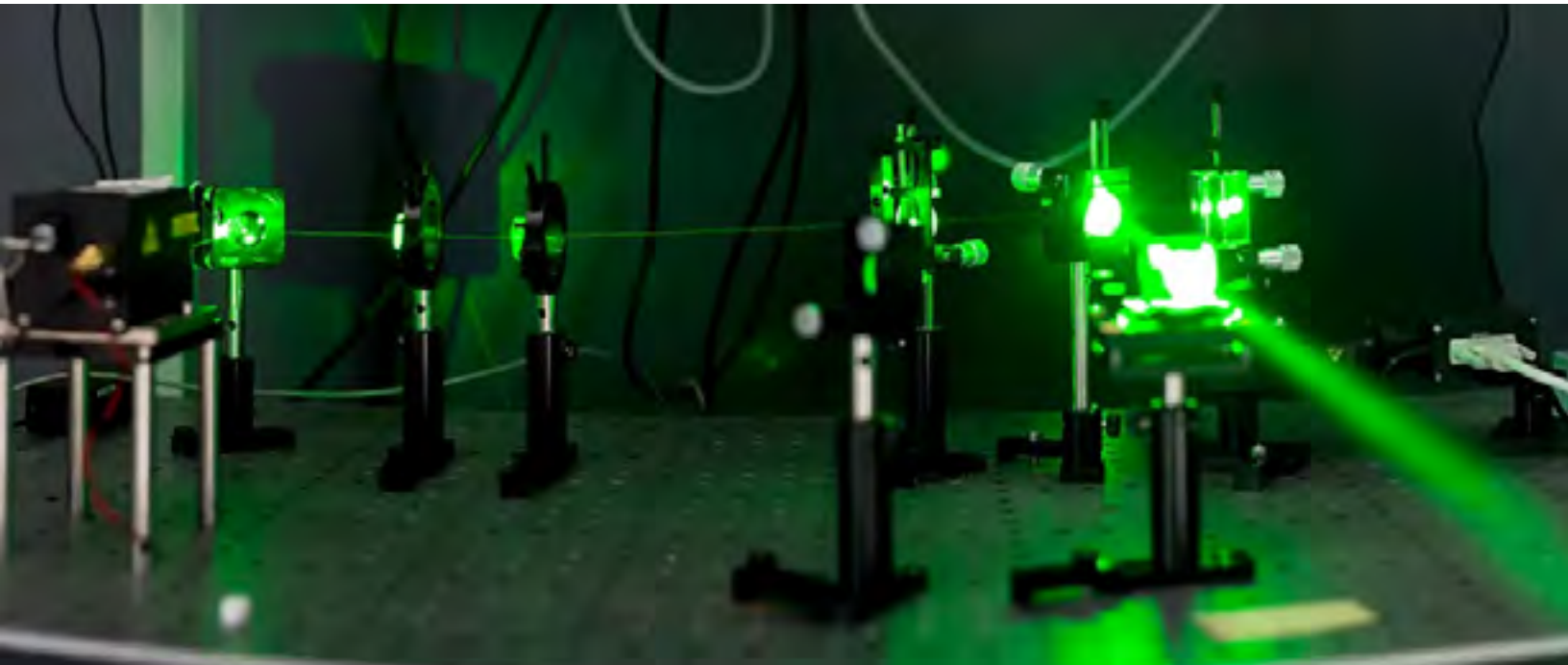
the range from mid to high power lasers. These filters can be designed as per the power and frequency of the laser used. These filters go through stringent quality control tests due to their direct relation to eye safety. The spectroscopic analysis gives the blocking ability of filters at wavelengths in the scale of OD and VLT%.

Aerospace, automotive, electronics and semiconductors, medical, food and textile, construction, utility and other industries use different types of lasers such as CO2 lasers, fiber lasers, solid-state lasers, etc., for versatile applications like marking, micro-materials, and macro-materials with a wide range of laser power intensity. Global manufacturers of laser safety goggles are KCWW, Honeywell International Inc., 3M, Uvex group, W.W. Grainger, Inc., Phillips Safety products, Thorlabs, Kentek Corp., Laser safety Industries, Global laser Ltd., VS eyewear, Univet, Trotec Laser GmbH, NoIR Laser Co., LLC, Laservision, Cole-Parmet Instrument Co., LLC, and Laser components. With a compound annual growth rate of 12.4%, the Global industrial lasers market size is projected to rise from USD 5.66 billion to 14.52 billion within the period 2018 to 2026. The product has a large demand in recent years, as the market has exponentially grown in all fields. High throughput production facilities are required to support the increase in demand for laser goggles.

In the view of the future scope of laser applications, lasers will be key a contributor

in many advanced fields including sensors, digitization, artificial intelligence to data encryption in quantum technology to name a few. To start with, ultra-short high intensity femtosecond laser pulses are the future of biomedical applications that will help both in imaging and conducting intricate specific area targeted surgeries. With regards to electric vehicle (EV) manufacturing, laser welding makes it possible to achieve narrow and high-speed welding at a lower heat which is crucial in EV batteries. Whereas self-driven cars employ laser-based scanning to map the targeted area in which the laser act as the eye of the car. In addition, the progress in the shrinkage in the size of semiconductor lasers, diode lasers, and several others, widens the possibility to employ them in various intricate applications. In conclusion, with the explosion in the innovation of laser technology, to be able to work with lasers and take advantage, an understanding of laser safety is extremely important in the first place.

Authors: Dr MG. Sreenivasan, Head of R&D, Dr Gokul Raja, Senior Scientist, Krithika Upadhy, Scientist & Smriti Sakhamuri, General Manager, Hind High Vacuum Company Pvt. Ltd. (HHV), India's premier thin film and vacuum technology company. Special thanks to Dr. Arindam Sarker, CTO of ASM-HHV Engineering Pvt. Ltd., for his input and advice.



Airbus Expects a Rise in Air Cargo Demand Over the next 20 years

Airbus expects a sustained demand for freighters over the next 20 years with nearly 70% of the current fleet anticipated to be replaced. According to the airframer's 2022 Global Market Forecast (GMF) for the 2022-2041 period, the world freighter fleet in service will reach 3,070 aircraft by 2041.

The new report, published on July 8, anticipates that there will be demand for 2,440 new-build or converted freighters over the next 20 years, with nearly 900 new-build freighters expected.

Of this expected freighter demand over 2022-2041, 990 will be 10-40 tonne single-aisle aircraft, 890 will be 40-80 tonne mid-sized widebody aircraft and 560 will be 80 tonnes large widebody aircraft. 2,030 aircraft were in service at the beginning of 2020. Of this number, 31% will stay in service (including 2020 & 2021 deliveries), while 69% will be replaced.



Express air cargo is predicted to outpace general air cargo. The airframer said that in 2019, express air cargo made up 17% of the airfreight market, while general air cargo encompassed 83%. But by 2041, express air cargo, boosted by e-commerce is expected to climb to comprise 25% of the market.

Airbus expects world air cargo traffic growth of 3.2% CAGR from 2019-2041. The positive expectation of freighter demand over the coming years comes as Airbus recently announced the development of a new large widebody freighter model – the A350F.

ST Engineering and EFW redeliver world's first A320P2F

ST Engineering and Elbe Flugzeugwerke (EFW) have announced the redelivery of the 'head of version' Airbus A320 Passenger-to-Freighter (A320P2F) aircraft to launch customer Vaayu Group (Vaayu) at ST Engineering's airframe facility in Singapore. This A320P2F aircraft is owned by the aviation asset management business of ST Engineering and is the first of several converted freighter aircraft that will be leased to Vaayu.

The redelivery marks the birth of the world's first A320P2F and completion of the Airbus P2F family developed jointly by ST Engineering, Airbus and EFW. It joins the other already operational Airbus P2F platforms, the A330-300P2F, A330-200P2F and A321P2F, which were first redelivered in 2017, 2018 and 2020 respectively. The A320P2F is the second variant in the Airbus narrow-body P2F solution. Similar to the A321P2F, the A320P2F was developed using original OEM data from Airbus which makes the design all the more robust and reliable. As the centre of excellence for Airbus P2F conversions, EFW leads the overall programme as well as marketing and sales efforts.



The current global Airbus A320 passenger fleet comprises thousands of aircraft, offering a wide selection and numerous fitting options for airlines and leasing companies wanting to invest in converted freighters. The A320P2F can accommodate up to ten [ULD] containers and one pallet position in the main deck and seven container positions in the lower deck. Given its gross payload of up to 21 tonnes at a maximum range of 1,850nm and total usable containerised volume of 159m³ (approx. 5,600ft³), the freighter aircraft has 85% stowage efficiency. This makes the A320P2F an ideal freighter platform to serve the fast-growing ecommerce market globally.

NAC places two Embraer E190F with Astral Aviation

Nordic Aviation Capital (NAC), the world's largest regional aircraft leasing company, has signed a memorandum of understanding (MoU) to place the first two E190F passenger-to-freighter conversions with Nairobi, Kenya-based Astral Aviation. "In May 2022, NAC and Embraer reached an agreement in principle to take up to 10 conversion slots for E190F/E195F with first deliveries starting in 2024. The aircraft for conversion will come from NAC's existing E190/E195 fleet," says an announcement from NAC.

"We are honoured to be the launch operator of the Embraer 190F, which will be based in Astral's Nairobi hub," says Sanjeev Gadhia, Founder & CEO Astral Aviation. "It will operate on a combination of scheduled and charter flights on our intra-African network. The E-Jets are well known for their efficiency, flexibility and sustainability. We are confident that the E-Jet freighter platform will be a game-changing addition to our growing fleet. We are grateful to NAC and Embraer for choosing Astral to be the launch operator of the E-Jet Freighter."

Norman C.T. Liu, President & CEO, NAC, adds: "As a launch lessor for the E-Jet freighter conversion programme, we are pleased to have executed a MoU to place two E190F aircraft with Astral Aviation, a leading cargo carrier servicing Africa. NAC aims to remain the leader in regional aviation and expand into larger narrow body aircraft, while building our full life cycle asset management capabilities."

Johann Bordais, President & CEO, Embraer Services & Support, says: "The response to Embraer's P2F programme, which was launched only in March of this year, has been incredible. NAC has already placed their first two aircraft, and it's great to welcome yet another operator to our E-Jet family."



De Havilland Canada introduces cargo conversion solutions for Dash 8-400

De Havilland Aircraft of Canada Limited ("De Havilland Canada") announced the launch of three cargo conversion solutions for the Dash 8-400 aircraft. The launched solutions include Quick Change (QC), Package Freighter (PF) and Freighter with Large Cargo Door (F-LCD) configurations to address a wide variety of operational business models. Known worldwide for its low cost of operation, exceptional performance and reliability in airline and special mission operations, the Dash 8-400 aircraft's rugged design also positions it exceedingly well for cargo operations.

"As the cargo market continues to grow, our cargo conversion solutions will easily enhance the overall value and extend the already high revenue-generating capabilities of the Dash 8-400 aircraft," said Jean-Philippe Côté, Vice President Programs, De Havilland Canada. "De Havilland Canada will offer the three launched cargo conversion solutions through original equipment manufacturer (OEM) Service Bulletins approved by Transport Canada, and we are ready to provide a wide range of OEM support as desired by our operators – from kit installation to on-site support through our global support infrastructure.

"Several built-in attributes of the Dash 8-400 aircraft, including its outstanding airfield accessibility, hot-and-high performance, range up to 1,640 nm and long structural life, position it very well for cargo operations, and its low noise and CO2 emissions mean that it's also an environmentally responsible choice," added Mr. Côté.



UPS flags off second airport gateway in India at Bengaluru airport



UPS has announced an expansion of its global smart logistics network with a new airport gateway facility in India at Kempegowda International Airport, Bengaluru (BLR). With this added capacity, a new Boeing 747-8 flight will now be able to further connect its customers in India with more international trade opportunities in Asia, Europe, and the Americas.

Deepak Shrivastava, UPS Managing Director for the Indian subcontinent. "According to India's Ministry of Commerce and Industry, for the first time, in the financial year 2022, exports have surpassed \$400 billion, demonstrating the strength of India's supply chains and the resilience of its small businesses. We are here to support that growth."

This is UPS's second dedicated airport gateway facility in India after opening its Delhi airport gateway in 2020 and another example of how UPS is empowering local businesses to grow, expand to new markets and compete globally. The Bengaluru facility will provide in-house customs clearance and serve as a cross-border trade link for southern India, giving customers an extended pick-up time of up to two hours, while strengthening supply chains for cross-border trade.

"We look forward to welcoming UPS's 747-8 aircraft, further connecting Bengaluru to the world," said Satyaki Raghunath, Chief Strategy & Development Officer at Bangalore International Airport Ltd. "Our airport is on track to become a world-class cargo hub powered by leading global logistics provider like UPS, who are meeting the exponential growth of e-commerce and boosting trade for businesses in southern India."

With the new flight scheduled to pass through BLR five times a week, and with six weekly flights coming into Delhi, the opening of the Bengaluru gateway almost doubles the number of flight rotations for UPS in India. The 747-8 is the largest aircraft in the UPS fleet, which means more capacity with a payload of 307,000 pounds, translating to lower emissions with fewer flights needed. By using owned aircraft, UPS also gives businesses the peace of mind they need when dealing with supply chain complexity.

Cargolux Selects 777-8 Freighter as Preferred Replacement for 747-400 Fleet

Boeing and Cargolux announced that Europe's largest all-cargo airline has selected the 777-8 Freighter as the preferred solution to replace its 747-400 fleet. The selection was announced at the Farnborough International Airshow.

"With the 777-8 Freighter being the preferred solution to replace our 747-400s, Cargolux is looking forward to continuing its ongoing relationship with Boeing," said Richard Forson, president and CEO of Cargolux.

The 777-8 Freighter is ideally suited for operators like Cargolux, creating a more sustainable and profitable future. With nearly identical payload and range capabilities as the 747-400 Freighter, the 777-8 Freighter will provide 30% better fuel efficiency and emissions and 25% better operating costs per tonne as the airplane to replace aging large freighters later this decade.

"With the selection of our newest freighter as their preferred solution, Cargolux continues its long and enduring history with Boeing, integrating the 777-8F seamlessly into the airline's all-747 cargo operations," said Stan Deal, president and CEO of Boeing Commercial Airplanes. "With its investment in the 777-8 Freighter, Cargolux will operate the most advanced, fuel-efficient, twin-engine freighter in the industry. The 777-8 Freighter significantly reduces CO2 emissions compared to previous models with a reduced noise footprint, helping to advance Cargolux's commitment to sustainable operations."



Eve announces a Letter of Intent (LOI) for up to 150 eVTOLs from collaboration between Embraer and BAE Systems

Eve Holding announced at the Farnborough Airshow a non-binding Letter of Intent (“LOI”) with Embraer and BAE Systems to explore the potential order of up to 150 electric vertical take-off and landing (eVTOL) vehicles with the aim of examining the aircraft application for the defence and security market. In a separate announcement, BAE Systems and Embraer signed a Memorandum of Understanding (“MoU”) at Farnborough International Airshow to potentially form a joint venture to collaboratively develop an innovative defence eVTOL variant using Eve’s platform.

“Teams from BAE Systems and Embraer will continue working together to explore how the aircraft, designed for the urban mobility market, can provide cost-effective, sustainable, and adaptable capability as a defense variant,” said Jackson Schneider, President and CEO of Embraer Defense & Security.

“Our customers’ operating environment is increasingly complex and eVTOL is just one example of how we’re looking at emerging technologies, including those from the commercial market. We are exploring how we can adapt these solutions to bring vital operational capability to our customers quickly and at a lower cost - whilst also supporting environmental and sustainability goals,” commented Ian Muldowney, Chief Operating Officer of BAE Systems Air.

In December 2021, Embraer and BAE Systems disclosed plans to collaborate on developing Eve’s eVTOL as a potential defence variant. This agreement reinforces the trust of the leading aerospace organisations in Eve’s vehicle and its adaptability for purposes other than urban air mobility.

Andre Stein, Co-CEO of Eve, added: “We are thrilled that Embraer and BAE Systems have chosen Eve as their platform for this collaboration. Our eVTOL can be adapted to meet various essential applications in this market, such as humanitarian response and disaster relief. This collaboration also indicates that the defence market can be more sustainable and at the same time allows Eve to remain focused on exploring the Urban Air Mobility market.”



Textron Aviation Special Missions Introduces Cessna Citation Longitude Maritime Patrol Aircraft

Textron Aviation announced a Maritime Patrol Aircraft variant of its Cessna Citation Longitude Aircraft.

“The Cessna Citation Longitude jet provides an excellent value for Special Mission operations due to its acquisition cost and operation cost combined with excellent speed, range and payload capacity,” said Bob Gibbs, vice president, Special Mission Sales for Textron Aviation. “Textron Aviation has developed and had certified factory provisions for various mission equipment supporting maritime patrol and surveillance missions, maximizing value for operations worldwide.”

With an eight hour maximum endurance and 3,500 nautical mile maximum range, the Cessna Citation Longitude MPA is outfitted with a transmissive belly radome for maritime radars, Beyond Line of Sight (BLOS) fairing, Electro-Optical/Infra-Red (EO/IR) sensor lift, and optional Night Vision Goggle (NVG) compatible lighting, making it ideally suited for surveillance missions over land and water, conducting search and rescue, border patrol, fishery monitoring, and more.

Endless Special Mission Possibilities

When government, military and commercial customers want airborne solutions for critical missions, they turn to Textron Aviation. The company’s aviation solutions provide the high performance and flight characteristics required to address the unique challenges of special mission operations. With unparalleled quality, versatility and low operating costs, Textron Aviation products are preferred for air ambulance, ISR, utility transport, aerial survey, flight inspection, training and a number of other special operations.



Daher unveils the Kodiak 900

The Kodiak 900 made its world debut at AirVenture Oshkosh today with Daher's introduction of this larger, faster version of the robust and rugged Kodiak 100 – filling out the company's airplane product line in joining the TBM 910 and TBM 960 very fast turboprop aircraft.

Inheriting the Kodiak 100's remarkable qualities as a backcountry STOL (short takeoff and landing) and multi-role airplane, the Kodiak 900 marks a further step with its fuselage length extension of 3.9 feet to provide more passenger room and cargo space, a cruise speed increase to 210 KTAS, and a greater useful load while offering a maximum range of 1,129 nm.

In addition to these enhancements, the Kodiak 900's operating economics have been improved, with a nine percent reduction in specific fuel consumption – which are in double digits when compared to competitors. This lowers the cost-per-seat-mile and the direct operating costs for commercial operators.

"This is another answer to the commitment of enhancing sustainability and improving the carbon footprint of general aviation. The Kodiak 900 is in a category of its own: a highly versatile unpressurized utility turboprop airplane that can carry impressive payloads while cruising comfortably at 210 KTS in refined luxury." NICOLAS CHABBERT, The Senior Vice President of Daher's Aircraft Division

The Kodiak 900 was certified by the U.S. Federal Aviation Administration on July 20, and deliveries will begin in 2023. Production of the Kodiak 900, along with the Kodiak 100 in its latest Series III version, is performed at the Sandpoint, Idaho facility of Daher's Aircraft Division.

"Today's official unveiling of the Kodiak 900 underscores the Daher parent company's firm commitment to the constant improvement of its aircraft product line," added Daher CEO Didier Kayat. "It follows our launch of the latest TBM family member – the TBM 960 – just three months ago."



Gulfstream G650 Family Receives EASA Steep Approach Certification

Gulfstream Aerospace announced that the Gulfstream G650 and G650ER have been certified for steep approach landing operations by the European Union Aviation Safety Administration (EASA), unlocking the ability for European operators of the ultralong-range aircraft to access even more airports around the world.

"We are pleased to be able to increase flexibility for our G650 and G650ER European operators by giving them access to such airports as London City near the city's financial district and even more remote airfields throughout Europe," said Mark Burns, president, Gulfstream. "The G650 family's high-speed performance advantage paired with this new certification will expand opportunities for our customers with more options for remote destinations."

The G650 family gained Federal Aviation Administration steep approach landing certification in 2019 after successful operations at airports like London City and Lugano. The aircraft demonstrated capability to perform a 5.5-degree approach and ability to operate on London City's short runway — 4,327 feet/1,319 meters for landing. The EASA certification unlocks approaches up to 6 degrees.





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- 2-Year M.A. (Maritime Laws)
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