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AVIATION

India's premier aviation monthly magazine

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UPDATE



**Interview with
Prof. Dr. Rao Tatavarti,
Distinguished Professor & SHM Expert,
Founder and Chairman of CAT-Global group**

**Interview with
Amit Mittal AVP
(Aviation & Airlines) of Bank of Baroda**

**A LOOK BACK AT 2021 SHOWS
THAT THE AVIATION INDUSTRY
MUST INCLUDE SUSTAINABILITY
IN ITS EVOLUTION.**



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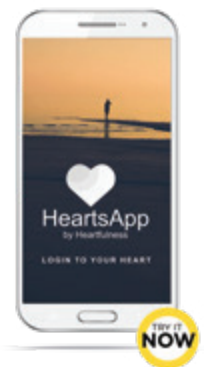
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Hello Folks,

I welcome and wish you yet another amazing year with the latest issue of your favorite aviation magazine. Despite hitting a few rough patches, aviation industry pulled through and has seen a tremendous recovery even ending it on a high note with the prestigious Dubai Airshow which we covered in the previous issue. I believe it can do the same with the current situation too.

While the James Webb Space Telescope lifted off to the space to give us a glimpse of what's beyond our reach, I suggest you to sit back and read about the latest updates and so many leadership changes that has happened across various firms. We brought you this time an interview with Prof. Dr. Rao Tatavarti, a structural health monitoring expert and a Founder and Chairman of CAT-Global group of companies who in plight of the recent loss to the Indian defenses says that ever growing list of air accidents should be of great concern and should be greatly looked into with the implementation of newer technologies. We have had a conversation 'Aviation Banker' Amit Mittal AVP (Aviation & Airlines) of Bank of Baroda who is hopeful of international lessors starting their operations for commercial Aircraft leasing in India. I'm sure as ever that you will not leave the remaining pages on Cargo, Business Aviation and Defense & Military news untouched.

I would say that's it for this time. And one last thing I would like to say, as the world is experiencing another wave of Covid cases. While I can only wish for your safety, you need to do your part; use mask to stay protected and be a protector of your loved ones too. Till you hear from me in the next issue, let me sign off with a salute to the martyrs.

Thanks

B. Kartikeya
Editor

■ VISTARA BOARD NAMES VINOD KANNAN AS NEW CEO OF AIRLINE



Leslie Thng, chief executive officer, after leading Vistara for more than four years will move on to take up a senior appointment with Singapore Airlines from January 1, 2022. The board of the company TATA SIA Airlines Limited has named Vinod Kannan to succeed Thng effective January 1, 2022.

Kannan is currently serving as Vistara's chief commercial officer. He joined the airline in June 2019 as chief strategy officer and currently heads amongst others network planning, revenue management, marketing, customer experience and cabin service functions. He started his career with Singapore Airlines in 2001 and has held various senior positions in the airline.

Prior to joining Vistara, he served as Chief Commercial Officer for Scoot the budget airline subsidiary of the Singapore Airlines Group. He has handled global network planning and has spent 8 years running operations in Indonesia, Italy and Saudi Arabia. He holds a master's degree in business administration from the National University of Singapore and University of California, Los Angeles.

Vistara's chairman Bhaskar Bhat said, "Leslie has led the airline through a significant phase, with the start of international operations and the entry into service of various aircraft including the Boeing 787-9 Dreamliner. Vinod will lead Vistara in its next phase of growth, building on the strong foundation laid by Leslie. This Company continues to benefit from the strong commitment of the two partners Tata Sons and Singapore Airlines to Vistara."

■ INDIA'S CDS DIES IN A MASSIVE CHOPPER CRASH ALONG WITH HIS WIFE AND OTHER AIR FORCE OFFICERS



In one of the major air crash India has witnessed in recent times, India's first Chief of Defence Staff (CDS), the country's most senior serving soldier, General Bipin Rawat, died in a helicopter crash in the Nilgiris district of Tamil Nadu, when he was flying to give a lecture at the Defence Services Staff College (DSSC) in Wellington.

He was traveling in a Russian made Indian Air Force (IAF) Mi-17V-5 helicopter along with his wife, Madhulika Rawat, and 11 other armed forces personnel. The only survivor was the pilot, Group Captain Varun Singh, who is battling for his life in Military Hospital Wellington.

The incident shocked the entire top the Indian government and PM Narendra Modi in his message said, General Bipin Rawat was "an outstanding soldier" and "a true patriot" who greatly contributed to modernising India's armed forces and security apparatus. "As India's first CDS, General Rawat worked on diverse aspects relating to our armed forces including defence reforms."

Rawat and his team flown in the morning in an Embraer Legacy jet from Delhi to Sulur Air Force Base, near Coimbatore. At Sulur, they transhipped to a Mi-17 helicopter for the short trip to Wellington and land at the DSSC helipad.

Raksha Mantri Rajnath Singh said the bodies of the victims will be flown to Delhi. A tri-service enquiry, led by Air Marshal

Manavendra Singh, is presently underway, he added. He also said Group Captain Varun Singh, decorated with the Shaurya Chakra on Independence Day this year, who was the lone survivor of the crash, is on life support and all efforts are being made to save him.

It remains unclear whether the accident took place because clouds caused the pilots to misjudge the terrain, or whether a mechanical failure had occurred.

General Bipin Rawat, India's first CDS, was a visionary who initiated far reaching reforms in the Indian military's higher defence organisation. He was instrumental in creating the foundation of India's joint theatre commands and giving impetus to the increased indigenisation of military equipment, a legacy which will be carried on and strengthened by successive generations.

■ SPICEJET FLYERS CAN NOW ENJOY A DOLBY ATMOS EXPERIENCE 38,000 FT UP IN THE SKY



SpiceJet and Dolby, a company with decades of expertise in delivering breakthrough audio and visual experiences to billions of people worldwide, have come together to deliver enhanced audio experiences for flyers 38,000ft up in the sky, in Dolby Atmos. SpiceJet passengers will be able to enjoy their favorite Dolby Atmos enabled content like blockbuster movies and podcasts on compatible Dolby Atmos-enabled devices. Flyers can enjoy this immersive audio experience via SpiceJet's in-flight entertainment (IFE) system, SpiceScreen.

Debojo Maharshi, Chief Marketing Officer, SpiceJet said, "As a majority of Indian travelers prefer watching Bollywood, Regional movies, Original shows and Podcasts, Dolby's revolutionary immersive audio technology Dolby Atmos, will add to the entertainment

quotient on SpiceScreen. By introducing Dolby Atmos on our in-flight entertainment system, SpiceJet has raised the bar for a superlative on-board experience. With Dolby Atmos, SpiceScreen brings a theatre-like 360 degree surround sound experience at 38,000 ft for passengers, making movies and podcasts more immersive and larger-than-life. We hope our passengers love the all-new experience on-board."

"We are excited to be part of this endeavor with SpiceJet and MojoBoxx. At Dolby, our goal is to enable spectacular entertainment experiences, and this is a great opportunity to cater to our audiences not just on the go but also when they fly", said Pankaj Kedia, Managing Director, Emerging Markets, Dolby Laboratories.

"We are proud to be Dolby's first digital partner in the sky, in the World. Our partnership will enable us to bring the cinema-like sound experience to passengers in the sky for the first time in the history of In-Flight Entertainment in the World with Dolby Atmos," said Manoj Kumar Gupta, Founder, MojoBoxx.

■ INDIGO REINFORCES REGIONAL NETWORK WITH NEW FLIGHTS FROM GUWAHATI



India's leading carrier launched the new direct flights between Guwahati and Pune, in the presence of Union Minister for Civil Aviation – Jyotiraditya Scindia (Virtually) as Chief Guest, amongst other eminent dignitaries. The new route was inaugurated with lamp lighting at the Guwahati airport. The flight commenced operations effective December 15, 2021.

Mr Sanjay Kumar, Chief Strategy and Revenue Officer, IndiGo, said, "We are pleased to initiate direct connections between the city of eastern light, Guwahati

and the Queen of the Deccan, Pune. These new domestic flights will strengthen inter and intra-regional connectivity and promote trade, commerce, and tourism in the eastern state.

The introduction of these direct connections will bolster the airline's domestic network and cut down the travel time between the two states by more than 50%. We are committed to providing an affordable, on-time, safe and hassle-free travel experience, onboard our lean, clean flying machine across a vast network."

"IndiGo has been working relentlessly towards increasing connections to and from north-eastern India. The airline currently operates more than 500 weekly flights from four stations in Assam, including Guwahati, Silchar, Dibrugarh and Jorhat,"

■ WIZZ AIR ABU DHABI CELEBRATES SIGNIFICANT MILESTONES IN ITS FIRST OPERATIONAL YEAR



Wizz Air Abu Dhabi, the UAE's ultra-low-fare national airline, the joint venture established between ADQ and Wizz Air Holdings plc. Announced its outstanding operational results for 2021.

During its first operational year, Wizz Air Abu Dhabi launched more than 34 destinations including Alexandria (Egypt), Athens (Greece), Baku (Azerbaijan), Bahrain, Belgrade (Serbia), Kutaisi (Georgia), Kyiv (Ukraine), Muscat (Oman), Odesa (Ukraine), Sarajevo (Bosnia), Sohag (Egypt), Tel-Aviv (Israel), Tirana (Albania) and Yerevan (Armenia) among others. The airline has successfully operated more than 1,080 flights since its launch in January 2021, with 506 flights taking place in the fourth quarter of the year.

Kees Van Schaick, Managing Director of Wizz Air Abu Dhabi commented: "We

are proud of what has been achieved since launching our operations in the emirate of Abu Dhabi. Through collaboration with key stakeholders, we have been able to grow and expand our network to more than 34 destinations despite all the challenges we have faced. This has helped us play our role in attracting tourists into the emirate and build on our ambitions to expand our network to even many more destinations. Our aim is to serve a large segment of travellers and provide them with affordable packages with great memories and experiences to remember. We look forward to continuing our contribution to enhancing the development of the aviation and tourism sectors in the emirate of Abu Dhabi and achieving many more successful milestones in the coming years,"

Wizz Air Abu Dhabi has introduced a new segment of travel in the UAE in line with its socio-economic vision. The launch of the airline highlighted the importance of bringing in a bold new frontier for ultra-low fare travel in the region. Wizz Air Abu Dhabi has contributed to supporting the UAE and Abu Dhabi's efforts towards the post-pandemic tourism recovery and driving the UAE capital's ongoing economic diversification strategy.

■ INDIGO PARTNERS WITH KOTAK MAHINDRA BANK TO LAUNCH KA-CHING CREDIT CARD



IndiGo and Kotak Mahindra Bank launched its travel credit card – 'Ka-ching'. The co-branded credit card was officially launched at the Delhi Airport by William Boulter, Chief Commercial Officer, IndiGo and Ambuj Chandna, President – Consumer Assets, Kotak Mahindra Bank in the presence of officials from both the organizations.

Ka-ching empowers customers to spend anywhere and redeem rewards for free IndiGo air tickets. Launched under the 6E Rewards program, the Kotak IndiGo Ka-ching Credit Card comes in two variants -- 6E Rewards and 6E Rewards XL, each providing exclusive benefits and unmatched rewards on domestic and international travel.

As a part of the welcome benefits, customers of the Kotak-IndiGo Ka-ching Credit Card will enjoy a complimentary air ticket worth up to Rs 3,000. Ka-ching will enable customers to accrue accelerated 6E Rewards on all spends that can be redeemed against the purchase of airline tickets anytime with no blackout dates. Furthermore, customers will have access to other special benefits on IndiGo, including discounted convenience fee, priority check-in, choice of seat and a complimentary meal, besides earning additional rewards on dining, shopping, transport, medical bill, utilities, fuel and other major categories.

Chandna said, "For us it has always been customer first and it has been our constant endeavour to provide the most attractive proposition that meets the aspirations and preferences of customers. With travel taking off in a big way, we have partnered with IndiGo to help our customers go places with Ka-ching. We have designed Kotak-Indigo Ka-ching to deliver a magical experience to our customers who love to travel. The Kotak-IndiGo Credit Card is a valuable addition to our growing portfolio of cards and will be the preferred card in our customer's wallet."

Boulter said, "We are pleased to partner with Kotak Mahindra bank to launch our co-branded credit card Ka-ching to provide the customers a memorable and hassle-free experience when they fly IndiGo. It is a perfect partnership as KMBL's huge base of customers will be able to avail benefits including IndiGo flight tickets and other services with 6E rewards accumulated on flight bookings, dining, entertainment and other spends. We strive to offer the best service to our customers every single day, as their satisfaction is at the heart of what we do. We have immense conviction in our partner KMBL, as both the brands believe in consistently enhancing engagement to deliver an outstanding customer experience."

■ SPICEJET RECEIVES 2021 'APEX NEWCOMER OF THE YEAR' AWARD FOR CABIN CREW APP



SpiceJet has bagged the 2021 Airline Passenger Experience Association (APEX) Award in the 'Newcomer of the Year' category for its SG Docs Mobile app for Cabin Crew. The award was conferred at the APEX EXPO held in Longbeach, California.

APEX is the largest non-profit airline association in the world dedicated entirely to passenger experience. The global airline association recognized SpiceJet for its Cabin Crew app developed in-house by SpiceTech, the technology subsidiary of SpiceJet, last year during the Covid-19 pandemic, which has helped digitize the operational processes of the cabin crew.

SpiceJet recently created SpiceTech as a separate technology subsidiary. SpiceTech's vision is to be the recognized world leader in aviation technology with innovative product offerings that it can make available to SpiceJet and other airlines around the world. SpiceTech is continuously innovating to enhance customer delight with exclusive product offerings.

The app hosts a range of digital documents, manuals, current cabin defects and various operational forms that the crew can easily access, both online and offline. The crew can use the app to submit Crew Baggage Declaration and Cabin Check forms that auto-capture the date and time of completion and, if being used in offline mode, are saved to the user's device before being uploaded to the Company's database once there is an internet connection. Both of these forms eliminate the traditional need to use hard copies.

Ashish Vikram, Chief Technology & Innovation Officer, SpiceJet said, "Innovation and technology is at the heart of everything we do to set new benchmarks in the airline industry. Our technology arm, SpiceTech, was formed with the sole purpose to achieve

excellence in our operations by simplifying the internal processes and introducing our passengers to newer and finer experiences. I feel extremely glad to receive this award that showcases the 'new' face of SpiceJet amid Covid that is committed to not just create superlative experiences for passengers but enhances operational capabilities of our workforce too. Going paperless across operations will also support SpiceJet's sustainability mission as a responsible airline."

■ AIR FRANCE-KLM AND INDIGO TO START CODESHARE AGREEMENT



Air France-KLM and IndiGo, India's leading carrier, are launching an extensive codeshare agreement. With this new partnership, Air France and KLM will offer their customers access to 25 new Indian destinations.

From their hubs in Paris and Amsterdam, Air France and KLM already serve 4 destinations in India: Delhi, Mumbai, Chennai, and Bengaluru.

On departure from the Indian provinces, Air France and KLM will open up their global network of over 250 destinations to IndiGo customers, with more than 120 destinations in Europe and about 50 in the Americas.

Subject to government approval, this cooperation will start in February 2022.

■ AIR NEW ZEALAND RECEIVES ATR'S 1,600TH DELIVERY



In the same month as it celebrated its 40 year anniversary, ATR has reached another impressive milestone in its history, delivering its 1,600th aircraft to national flag carrier, Air New Zealand. This delivery highlights the enduring strength of the ATR programme, providing essential connectivity to communities all over the world. It also proves the value of the ATR 72-600 at serving domestic routes in New Zealand as it is the last of 29 aircraft ordered.

While ties between the two companies initially began some 25 years ago with the delivery of first generation ATRs, this last decade has seen the forging of closer ties, with the delivery of the 29 -600 aircraft and through an important collaboration that enhanced the aircraft's approach capabilities. The introduction of the RNP AR 0.3/0.3 feature, part of ATR's latest Standard 3 avionics suite, helped the airline and its pilots with the accuracy of the approach into Queenstown airport and providing reliable connectivity to the local community, who benefit greatly from ski tourism in the mountainous region. Sustainability is also a key concern for both airline and manufacturer, with Air New Zealand having chosen the ATR 72-600 for its fleet as it burns 40% less fuel and emits 40% less CO2 than a similarly sized regional jet. This shared commitment to further enhancing eco-efficiency led to an agreement to work together to explore the future of the regional aviation ecosystem, including hybrid aircraft in 2018.

Air New Zealand's Chief Executive Greg Foran says the airline is looking forward to welcoming ATR's 1600th aircraft into its fleet. "We really value our longstanding relationship with ATR and this will be the 29th to join our fleet since 2012. During that time the fleet of ATRs have boosted the airline's regional network by over 50 per cent and they have proven extremely efficient. Our ATRs have helped us build one of the best domestic networks in the world and have flown an estimated 33.5 million passengers on more than 636,000 flights around New Zealand."

Stefano Bortoli, CEO of ATR said: "We are of course proud of this achievement and I recognise the hard work and dedication of every ATR employee, past and present, in getting us here. As we have recently celebrated 40 years of making a difference, it

is the perfect moment to think about how the ATR has supported communities throughout New Zealand. Passengers really depend on our aircraft to access opportunities to do business, study or simply see their loved ones. An aircraft needs to be efficient and versatile to thrive in New Zealand, so it makes perfect sense to build a fleet of turboprops. And while today there are many ATR's in New Zealand, there is now also an important part of New Zealand in many ATRs, thanks to their input into the RNP AR 0.3/0.3 approach technology. Meaning that operators all over the world can benefit from yet another innovative product evolution."

AIRBUS INCREASES ITS INNOVATION FOOTPRINT IN SPAIN TO DEVELOP NEW HYDROGEN TECHNOLOGIES



Airbus is increasing its presence in Spain with the launch of an Airbus UpNext entity, a wholly-owned innovation subsidiary, and a Zero Emission Development Centre (ZEDC) for hydrogen technologies. This complements Airbus' existing footprint in Spain and reaffirms Airbus' commitment to remain a strong player in the Spanish aerospace ecosystem. Airbus has long been a pioneer in composite technologies in Spain, both in materials and manufacturing processes.

"Establishing Airbus UpNext and the ZEDC in Spain strengthens our Research & Technology footprint in the country and ensures the involvement, from the start, of some of the best experts to support our zero-emission ambition," said Sabine Klauke, Airbus Chief Technical Officer.

The Airbus UpNext entity will initially be accountable for the study and demonstration of hydrogen-powered non-propulsive energies as well as future tanking operations applying advancements in vision-based

technology. This new presence will leverage the expertise of Airbus Commercial Aircraft, Airbus Helicopters and Airbus Defence and Space in Spain. Airbus UpNext gives future technologies a development fast-track by building demonstrators at speed and scale. This entails the sourcing of new talent and suppliers in order to evaluate, mature and validate potential innovative products and services that encompass radical technological breakthroughs.

The ZEDC follows the opening of two other ZEDCs in June this year at Airbus sites in Bremen, Germany and Nantes, France. The focus of the Spanish ZEDC is non-propulsive energy, systems for fuel cell cooling and fiber optics, as well as carbon fiber tanks for storing cryogenic liquid hydrogen. The tank development is done in a coordinated approach with the other Airbus national entities. These technologies are critical to fuel a future zero-emission aircraft, supporting the goal of an entry-into-service by 2035.

FRENCH BEE TAKES DELIVERY OF ITS FIRST A350-1000



French bee, the low-cost, long-haul airline (Groupe Dubreuil member) based in France, has taken delivery of its first A350-1000, on lease from Air Lease Corporation, to join its fleet and make the airline an all-A350 fleet operator. The aircraft is the first of two A350-1000s to be operated by the carrier on route from Paris to Saint Denis de La Reunion Island in the Indian Ocean.

The A350-1000s will complement the four A350-900 aircraft already in the French bee fleet, providing the airline with unrivalled operational flexibility and eco-efficient solutions for its network.

The aircraft features 480 seats in a two-class layout (40 premium class and 440 economy class), providing all the

comfort and amenities of Airbus' Airspace cabin, including state-of-the-art, in-flight passenger entertainment (IFE) and full WiFi connectivity throughout the cabin. The A350 cabin is also the quietest of any twin-aisle aircraft.

The A350-1000, Airbus' largest widebody in the twin-engine category, features the latest aerodynamic design, a carbon fibre fuselage and wings, plus new fuel-efficient Rolls-Royce Trent XWB-97 engines, allowing the airline to fly long-haul destinations up to 16,000 km (8,700nm). Together, these elements translate into unrivalled levels of operational efficiency with 25% less fuel burn and CO2 emissions and 50% reduction in noise.

AIRBUS FIRMS UP ORDER FOR FOUR A350F FREIGHTERS



Airbus has firmed up an order for the purchase of four A350F freighter aircraft with the CMA CGM Group, a world leader in shipping and logistics. This order will bring CMA CGM's total Airbus fleet to nine aircraft, including four A330-200F and one A330-200 to be converted into a freighter.

The A350F is based on the world's most modern long range leader, the A350. The aircraft features a large main deck cargo door and a fuselage length optimised for cargo operations. Over 70% of the airframe is made of advanced materials resulting in a 30t lighter take-off weight, generating an at least 20% lower fuel burn over its current closest competitor. With a 109t payload capability (+3t payload/ 11% more volume than its competition), the A350F serves all cargo markets (Express, general cargo, special cargo...) and is in the large freighter category the only new generation freighter aircraft ready for the enhanced 2027 ICAO CO₂ emissions standards.

AVIATION CAPITAL GROUP COMMITS TO 20 A220S AND 40 A320NEO FAMILY AIRCRAFT



Global full-service aircraft lessor Aviation Capital Group (ACG), wholly owned by Tokyo Century Corporation, has signed a Memorandum of Understanding (MoU) for 20 A220s and a firm contract for 40 A320neo Family aircraft, of which five are A321XLRs.

"We are delighted to expand our portfolio with additional A220 and A320neo Family aircraft. These highly advanced aircraft will enhance ACG's strategic objective to offer our airline customers the most modern and fuel-efficient aircraft available," said Thomas Baker, CEO and President of ACG.

"The order is another gratifying endorsement of our single aisle products by one of the world's premier aircraft asset managers, ACG and the Tokyo Century Group. It also forcefully confirms the A220 as a growingly desirable aircraft and investment in the commercial aviation landscape. We congratulate and thank ACG for its decision to select both the A220 and A320neo Families," said Christian Scherer, Chief Commercial Officer and Head of Airbus International.

The A220 is the only aircraft purpose-built for the 100-150 seat market and brings together state-of-the-art aerodynamics, advanced materials and Pratt & Whitney's latest-generation PW1500G geared turbofan engines. Featuring a 50% reduced noise footprint and up to 25% lower fuel burn per seat compared to previous generation aircraft, as well as around 50% lower NOx emissions than industry standards, the A220 is a great aircraft for regional as well as long distance routes operations.

777 PARTNERS ORDERS 30 ADDITIONAL 737 MAX AIRPLANES

Boeing and 777 Partners announced the Miami-based investment firm will nearly double its 737 MAX order book with the purchase of 30 additional jets. The new order expands 777 Partners' commercial aircraft portfolio to a total of 68 737 MAXs, in its fourth order this year for the fuel-efficient, single-aisle jets. Valued at \$3.7 billion at list prices, the order will enable 777 Partners to expand 737 MAX operations across the fleet of its affiliated global low-cost carriers.

"We're delighted to be able to announce the almost doubling in size of our order with Boeing," said Josh Wander, managing partner of 777 Partners. "We have long been confident in the economics of the 737 MAX family but we are especially excited about the 737-8-200 variant which represents the bulk of our additional orders. We're confident that this aircraft will be the hallmark ULCC/LCC asset, particularly in the sub-200 seat market. As travel demand returns, 777 has accelerated our quest for efficiencies in both operating cost and carbon footprint at our operating carriers. In these areas the 737-8 is compelling and the 737-8-200 is simply unrivalled."

The 737 MAX family reduces fuel use and carbon emissions by at least 14% compared to the airplanes it replaces, reducing operating costs as well as the environmental footprint for 777 Partners' affiliated airlines. Every 737 MAX features a passenger-pleasing Boeing Sky Interior, highlighted by modern sculpted sidewalls and window reveals, LED lighting that enhances the sense of spaciousness and larger pivoting overhead storage bins.

"We greatly appreciate 777 Partners for their trust in our products, including repeat orders for the 737 MAX and expanding their fleet to include the high-capacity 737-8-200 model," said Ihsane Mounir, Boeing senior vice president of Commercial Sales and Marketing. "777 Partners is enabling growth for its affiliated low-cost carriers by leveraging the 737 family's flexibility, reliability and efficiency to serve passengers for years to come."

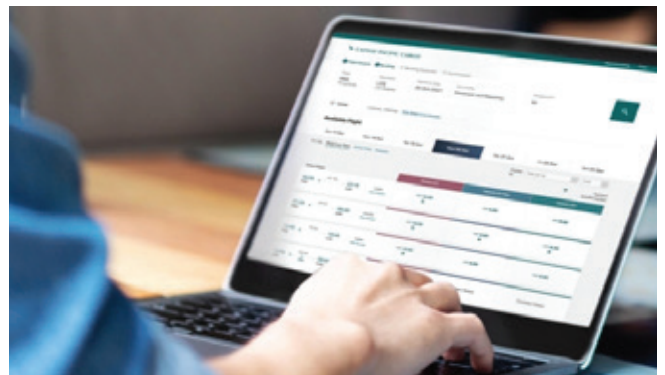
Dnata digitises cargo handling with Descartes CORE

Descartes Systems Group, the global leader in uniting logistics-intensive businesses in commerce, announced that dnata, one of the world's largest air services providers, is using Descartes CORE BLE (Bluetooth Low Energy) real-time tracking solution to help manage its mobile assets for cargo handling at airports. By digitizing the tracking process, the solution provides dnata with greater asset visibility to allow for more effective movement of air cargo at airports.

"Airports have very dynamic, fast-moving operations and being able to service our airline and freight forwarder customers effectively requires us to make sure we know the location of dollies and other air cargo assets at all times. The Descartes CORE BLE solution has given us location visibility in real-time, allowing us to better maximize asset utilization and minimize losing sight of them, which can be a challenge at the world's largest airports. As part of our digitization strategy, we were also able to successfully launch a real-time shipment tracking pilot and are poised to offer it as a service," said Kevin Walsh, manager operational support services, dnata.

The Descartes CORE BLE real-time tracking solution combines Descartes CORE BLE tags that are applied to mobile assets and readers that capture the movement of the assets. The readers use mesh-networking technology to improve coverage resilience and through the use of solar power, can be placed throughout an airport because they do not need a power source. The tracking data helps ground handlers better understand the location of cargo-handling assets, better match capacity with asset inventory, and reduce the costs associated with misplaced equipment or the requirement to lease additional assets.

"With the high shipping volumes, the industry is getting the most from existing air cargo handling assets is critical to keep freight moving," said Glenn Palanacki, Vice President, Industry Strategy at Descartes.



Cathay Pacific Cargo launches new cargo-booking platform in South Asia

Cathay Pacific Cargo is launching Click & Ship, its new digital booking platform, progressively across its network starting this month. Click & Ship promises booking transparency and speed, day and night. Customers in South Asia, including India, Nepal, Bangladesh and Sri Lanka can view prices and capacity, and book cargo with instant confirmation in just three steps through the intuitive booking interface.

Digitalisation and automation are central to Cathay Pacific Cargo's vision to become the world's most customer-centric air cargo service brand. Click & Ship is the latest digital innovation along this journey.

"Our customers globally have been telling us that they want a quicker and more efficient way to book shipments at any time," said Rajesh Menon, Regional Head of Cargo, South Asia, Middle East and Africa. "We listened. We are rolling out Click & Ship progressively across our network including South Asia. We aim to make real-time flight schedules, space availability, allotments, and updated rate information available on www.cathaypacificcargo.com and www.ezycargo.com for all Cathay Pacific Cargo customers over the next year."

Over the past 20 years, the air cargo industry has continued to rely on manual processes and email confirmation for shipment bookings, while the passenger airline industry has evolved to enable customers to book tickets and other services online. In recent years, Cathay Pacific Cargo has pioneered paperless operations and automation of manual processes in the airfreight industry, working with its majority-owned subsidiary and IATA e-freight partner, Global Logistics System (HK) Co., Ltd (GLSHK). The launch of Click & Ship marks a bold leap forward in the end-to-end digitalisation of air cargo.

Rajesh Menon added: "We are certain Click & Ship will be advantageous for our customers in the region. It will transform the cargo booking experience, making it a streamlined process with a fast and intuitive interface that mimics the passenger ticket-booking experience. It gives our customers visibility of price and inventory and means registered agents can book shipments at their convenience with auto-confirmation."

Cargolux selects IBS Software's iCargo solution as next generation Cargo Management System



IBS Software has signed a strategic long-term deal with Cargolux, Europe's No. 1 all-cargo airline, for the replacement of its cargo management system. Cargolux will deploy IBS Software's iCargo SaaS solution

to transform and manage its global air cargo business.

The iCargo implementation will enable Cargolux to further deliver and improve services and streamline customer

experience. iCargo's air cargo ecosystem will allow the airline to realize improved efficiencies through lean business processes. With APIs providing enhanced rich data sharing, Cargolux will facilitate improved co-ordination with partners and deliver a superior experience to customers.

"Cargolux is in the midst of a digital transformation and the implementation of iCargo as our next generation cargo management system is another important step for us," said Richard Forson, CEO of Cargolux.

"Cargolux is a pioneer in the global air cargo industry and commands great respect from peers and technologists like us at IBS Software, who are deeply embedded in the global air cargo industry. We are thrilled to be associated with a global leader like Cargolux. The air cargo industry is innovating at pace with digitalization at the core. Technology is driving change and raising the strategic profile of cargo, and we're proud to be at the forefront of such a significant shift," said Ashok Rajan, Senior Vice President & Head, Cargo & Logistics Solutions, IBS Software.

DRONAMICS launches unmanned aerial vehicle for cargo Black Swan



Svilen Rangelov, Co-Founder & CEO and Konstantin Rangelov, Co-Founder & CTO, Bulgaria-based DRONAMICS unveiled the Black Swan, a new type of cargo-carrying unmanned aerial vehicle (UAV) that can carry up to 350 kg for up to 2,500 km at up to 50 percent lower cost than any aircraft.

The Black Swan can operate from

runways as short as 400 metres, unpaved, and will enable DRONAMICS to serve customers in even the smallest and most remote communities, an official statement said. "No longer will anyone be forced to choose between low-cost road freight that can take days to deliver or fast air freight that is ever so expensive. Same day, affordable airfreight is finally here."

DRONAMICS has signed an agreement with Sofia Airport for innovation initiatives, and the Black Swan launch, after six years in development, was held at the airport yesterday in a windy, chill evening.

"The unveiling of the Black Swan represents a critical milestone in the company's mission to enable same-day shipping for everyone, everywhere," Svilen said. "The years of hard work is paying off and as soon as we're done with our extensive test program and obtain certification in 2022, we are going to begin commercial operations, serving customers in Europe and beyond years ahead of everyone else."

Konstantin added: "For more than 100 years, people have designed airplanes for humans first, meaning they were never really optimised for cargo. In fact, they're quite inefficient. By being extremely focused solely on carrying cargo, we were able to develop an aircraft that is able to do the job at up to 80% lower cost than any other airplane, meaning we can bring the benefits of aviation to billions of people around the world who do not get regular air service."

Boeing Announces UPS Purchase of 19 767 Freighters



Boeing announced an order for 19 767 Freighters from UPS highlighting the 767 Freighter's outstanding operational efficiency and payload capability to serve its customers at a time of robust air cargo demand.

"The Boeing 767 is the most versatile aircraft we operate," said UPS U.S. Operations President Nando Cesarone. "Our plan to purchase 19 aircraft and take delivery between 2023 and 2025 aligns with the strategy and capital expenditure forecast shared during our June 2021 Investor and Analyst Day. It also supports our sustainability efforts by making our fleet more efficient and improving reliability," he said.

The deal adds to a record-breaking year for Boeing freighter sales, including 80 firm orders for new widebody freighters and more than 80 orders for Boeing Converted Freighters. In 2021 air cargo demand has surged due to an expansion of e-commerce and express cargo markets.

"This latest order for 19 jets bookends an incredible year for the Boeing Freighter family," said Hssane Mounir, Boeing senior vice president of Commercial Sales and Marketing. "Since the program was launched, UPS has recognized the value of the 767 Freighter and utilized the airplane's outstanding cargo capabilities throughout its network. These new jets will enable UPS to meet expected near-term and long-term cargo demand with the proven economics, reliability and flexibility that are synonymous with the 767 Freighter."

Boeing Expands 737-800BCF Conversion Capacity to Meet Strong Market Demand



Boeing and Taikoo (Shandong) Aircraft Engineering Co. Ltd. (STAECO) announced plans to create additional capacity for the market-leading 737-800 Boeing Converted Freighter (BCF) to help meet continued strong market demand.

In 2022, Boeing will add two 737-800BCF conversion lines at STAECO's facility in Jinan, China. The first new line will open in the first quarter of the year, with the second line expected to begin conversions by midyear. Once the two new lines are operational,

STAECO will have seven conversion lines dedicated to the 737-800BCF.

"Boeing is pleased to continue growing our strong and mutually beneficial relationship with STAECO by creating additional conversion capacity to meet growing global demand," said Peter Gao, vice president, Boeing Commercial Sales and Marketing for China. "STAECO has exhibited the expertise and track record of delivering quality freighter conversions and will play a critical role in helping Boeing meet our

customer commitments today and in the future."

Boeing forecasts 1,720 freighter conversions will be needed over the next 20 years. Of those, 1,200 will be standard body conversions with Asia carriers accounting for 40 percent of that demand.

"The successful implementation of the 737-800BCF program at STAECO has become a model of cooperation between manufacturer and MRO on passenger-to-freighter conversions," said Wang Chao, president, STAECO. "We are honored by Boeing's ongoing trust and partnership in expanding our capacity through a sixth and seventh conversion line, and we look forward to continuing to fulfill our commitments in support of our mutual customers."

This year, Boeing announced it would create additional 737-800BCF conversion capacity at several sites, including with existing supplier Guangzhou Aircraft Maintenance Engineering Company Limited (GAMECO), and with new suppliers Cooperativa Autogestionaria de Servicios Aeroindustriales (COOPESA) in Costa Rica, KF Aerospace in Canada, and Boeing's London Gatwick MRO facility in the United Kingdom.

Singapore Airlines selects the world's newest freighter - the A350F

Singapore Airlines (SIA) has signed a Letter of Intent (LoI) with Airbus for seven A350F freighter aircraft. The agreement will see the A350F begin replacing the airline's existing B747-400F fleet in the fourth quarter of 2025.

"We are honoured by Singapore Airlines' vote of confidence in the A350F as it renews its freighter fleet. The A350F is the world's all-new large freighter and will be unmatched in its market segment in terms of operational efficiency, lower fuel consumption and CO₂ savings," said Christian Scherer, Airbus Chief Commercial Officer and Head of Airbus International. "It is gratifying that Singapore Airlines recognises the value of the A350F as we build on the strong partnership we already enjoy."

Earlier this year Airbus received Board of Directors approval for a freighter derivative of the A350 designed to meet the imminent wave of large freighter replacements and the evolving environmental requirements, shaping the future of airfreight. The A350F will be powered by latest technology, fuel-efficient Rolls-Royce Trent-XWB97 engines.

As part of the world's most modern long-range family, the A350F will have a high level of commonality with the A350 passenger versions. With a 109 tonne payload capability, the A350F will serve all cargo markets. The aircraft features a large main deck cargo door, with its fuselage length and capacity optimised around the industry's standard pallets and containers.

Over 70% of the airframe will be made of advanced materials, resulting in a 30 tonne lighter take-off weight and generating at least 20% lower fuel consumption and emissions over its current closest competitor. The A350F will fully meet ICAO's enhanced CO₂ emissions standards coming into effect in 2027.

Qantas to convert two Airbus A330 into freighters

Qantas will convert two of its Airbus A330 passenger aircraft into freighters to support the significant shift towards consumers shopping online. One of the converted wide-body freighters will be used in Qantas Freight's international network, while the other will be a new addition to the dedicated fleet that serves Australia Post's domestic parcel and mail business.

In addition, Qantas Freight will receive its third Airbus A321P2F freighter this week, which will also operate for Australia Post. The narrow-body aircraft previously operated passenger services for Jetstar. The freighter will provide additional capacity ahead of what's expected to be the busiest Christmas period ever for air cargo.

The seat capacity of the two A330s will be replaced by more efficient scheduling on the Qantas passenger network. Qantas will also take delivery of three new Boeing 787-9 Dreamliners during 2022. Qantas CEO Alan Joyce said the conversion of the two wide-body A330 aircraft would significantly increase capacity for both domestic and international freight.



AVIATION SAFETY – SNAFU?

Recent spate of tragic events the world over, involving aircraft crashes with irreparable damages and fatalities, has brought the subject of safety in the aviation sector to the forefront of discussions once again.

Aviation Update had a tête-à-tête with Prof. Dr. Rao Tatavarti, DRDS, FOSI, FAPAS. Prof. Tatavarti is the Founder and Chairman of CAT-Global, a group of high-end technology startups in Nashik, and the Distinguished Professor and Director, GVP Academic Institutes, in Visakhapatnam, whose expertise among many other fields is Structural Health Monitoring.

Having pioneered the indigenous development of the state of art photonic systems for structural health monitoring of aerial platforms, in addition to being in the forefront of research and development over the last three and a half decades; Aviation Update would like to get your views on the important subject of aviation safety.

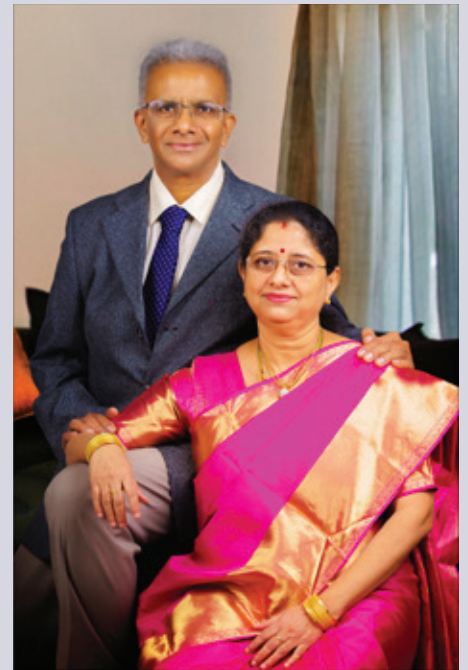
Are the air accidents and incidents around the world significant in numbers?

The Bureau of Aircraft Accidents Archives (B3A), a non-government organization based in Geneva, compiles statistics on

aviation accidents of aircraft capable of carrying more than six passengers, excluding helicopters, balloons, and combat aircraft. In just 2020 and 2021 alone, B3A archived 174 air incidents, the world over, involving 822 fatalities. The statistics therefore are not only staggering, but appalling.

What about air accidents involving military aircraft, specifically in India?

Based on publicly accessed information, during the years 2020–2021, the number of accidents and incidents involving military aircraft all over the world is 84. In India alone, the number of accidents and incidents involving military aircraft is 9 (HAL Cheetah on Feb.3, 2020, MIG 29 K on Feb. 21, 2020, MIG 29 UPG on May 8, 2020, MIG 29 K on Nov. 26, 2020, MIG 21 Bison on May 21, 2021, HAL Cheetah on Sept. 21, 2021, Mirage 2000 on Oct. 21, 2021, MI 17 V5 on Dec. 8, 2021, MIG 21 Bison on Dec. 24, 2021).



Of great concern is the fact that not only the number is high, but also, in a two-year span, the crashes involved almost all varieties of aircraft in use today by the three armed forces, resulting in tragic losses of human lives and huge losses to the national exchequer.

Being one of the top importers of defence equipment and armaments in the world, India spends a very large amounts of money every year on defence imports





and therefore the ever growing list of air accidents should be of great concern to all.

What are your views on the important subject of aviation safety specifically against the backdrop of the recent tragic accident of MI 17 chopper involving India's CDS?

Helicopter crashes have now become a recurring occurrence in India. It is extremely painful to note that India has witnessed a list of high profile accidents involving VIP helicopter crashes involving two Chief Ministers of Indian States Andhra Pradesh and Arunachal Pradesh, Speaker of Parliament, and several Armed Forces personnel, which resulted in tragic deaths of important people and loss of national assets.

On that fateful day of December 8, 2021, Gen. Rawat and his entourage who were flying onboard the Russian designed chopper MI 17 V5, could not complete an otherwise routine 80km flight and crashed, eventually martyring all persons onboard and sending shock waves across the entire nation.

Now, you have to remember that the MI 17 V5 chopper is considered as the workhorse of Indian Air Force due to its superior capabilities. In 2014, the Indian Air Force decided to modify the Mi-17V5 for the VVIP transport role to ferry the president, vice-president and prime minister. The decision was made after the Narendra Modi government barred dealings with Italian company Agusta Westland over bribery allegations related to then new fleet of AW-

101 helicopters. The AW-101 was earlier considered optimal for VVIP transport given that it had three engines, affording it greater redundancy in the event of damage or engine failure.

The MI 17 chopper and its variants are also very popular across the world and many countries have acquired these for their operational needs. However, even the most popular Russian MI 17 chopper is involved in many crashes. Based on publicly accessed information, since 2010, there have been more than 40 crashes of MI 17 choppers all over the world.

What is really confounding and extremely poignant is that, the top of the line aircraft with the latest avionics and technologies on board - supposedly capable of navigating accurately even in challenging and adverse air envelopes and weather conditions, and piloted by highly trained, experienced and seasoned pilots who purportedly follow established, standard and safe operating procedures and protocols - ended up crashing with tragic consequences.

Therefore, personally I can only react with extreme poignancy, helplessness and utmost frustration when it comes to aviation safety.

What could be the cause of so many crashes?

Notwithstanding the information brochures highlighted by the aviation industry, and parroted by the users, detailed scientific and critical investigations revealed that structural damages on the aircrafts, snags in avionics, inclement weather, bad piloting, difficult terrains and poor design often result in crashes. Of these, structural damages on the aircraft are the most pernicious in nature,



Therefore, personally I can only react with extreme poignancy, helplessness and utmost frustration when it comes to aviation safety

as they are extremely difficult to detect and assess during visual inspections - which is still the primary method for assessing structural damage. The current NDT (Non Destructive Testing) tools and techniques for assessing the structural integrity are also fraught with many limitations and impracticalities, thereby making the task of assessing structural damages in critical, but inaccessible locations on the platform rather difficult, if not impossible.

What about the current R&D, are there any tools and techniques available for aiding in navigation even in inclement weather and for structural health monitoring?

There is a growing demand to replace the pitot tube technology currently being used by the Aerospace Industry on board all aircrafts with better technologies for monitoring air data products which are fundamental necessities for safety, navigation and stability of aircrafts.

Aircrafts especially, the fast moving aircrafts and aircrafts for operational





requirements need environmental information (air data products) in real time. Air data products like wind speed, wind direction, temperature, pressure, density of air, shear and turbulence, in addition to Angle of Attack (AoA), and Angle of Side Slip (AoSS) are necessary to minimize / control the instabilities of the aircraft and also to facilitate safe navigation.

Multinational corporations in developed countries, and major defence industries around the world have been working on laser based technologies for decades with multibillion dollar budgets. Their efforts have apparently resulted in technologies which are now at the technology demonstration stages. However, these technologies may not be immediately available for use (even after successful trials) by India, for strategic and commercial reasons.

Against this backdrop, we have indigenously designed and developed a photonic system taraNi. taraNi - Technology for Air data Reckoning for Aerial Navigational Information was developed for ADA, DRDO as a compact, lightweight, cheap, direct detection optical system that can remotely measure wind speed and direction, density, pressure, temperature and turbulence in air, ahead of a fast moving aircraft - whose flight envelope may vary from sea level to stratosphere, over land and sea - with aircraft speeds going up to hypersonic speeds. Additionally, information pertaining to AoA and AoSS are also provided by taraNi.

The prototype of taraNi was tested and proved at NAL's Supersonic Wind Tunnel Facility for wind speeds up to 2.0 Mach. The system needs to be flight tested once the intended aircraft (AMCA) is ready.

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The capabilities were detailed and demonstrated to HAL, Nashik about two years ago as Proof of Concept

The remotely operable, portable light weight system taraNi which can be easily integrated on board any platform is highly sensitive, accurate and again free of the constraints associated with the many available / under development systems and technologies around the world. As it can be easily configured to provide real time information on air turbulence ahead of the moving aircraft. taraNi would be immensely useful for navigating even in inclement weather conditions (Controlled Flights in Terrain – CFIT) and therefore facilitate safe navigation.

Coming to the remote, real time assessment of structural integrity of aircrafts, we have already designed and developed two photonic systems VIDUR and VEDA whose technologies were demonstrated to HAL, Nashik. The indigenous systems are capable of remotely detecting, localizing and quantifying damages on structures so that an assessment of the longevity and the functional utility of the aircraft can be made realistically in real time. The capabilities were detailed and demonstrated to HAL, Nashik about two years ago as Proof of Concept. In short, VIDUR and VEDA would be useful in

realistically determining the airworthiness of aircrafts. However, after so much time we are nowhere near receiving any order or commitment from HAL. Their indifference to indigenous technologies is mind boggling.

Why has India not been able to harness such indigenous technologies that could save collateral losses and lives of people?

Well that is a billion-dollar question which really needs to be answered by the stakeholders and decision makers in defence ministry, IAF, defence PSUs like HAL, and related aviation industry. What is surprising and confounding is the attitudes and mindsets of decision makers, in not encouraging and facilitating indigenous technologies and systems. It requires phenomenal mental and fiscal strengths for indigenous startups with noble intentions and innovative technologies, to oppose the prevalent disdain for indigenous technologies. Notwithstanding the rhetoric of politicians, administrators and almost all the decision makers we have experienced innumerable bottlenecks in our endeavors to push indigenous technologies and systems for national use. The mindset and bias towards imported technologies and systems is overwhelming. Even recently, we were educated by senior officers of the defence PSU that there were no problems with visual inspections of aircrafts for assessment of structural integrity (despite the many tragic crashes which resulted in untimely demises of many young pilots), and therefore why they should upset the applecart by bringing in indigenous technologies which need to be evaluated under operational conditions. In summary, to answer your question succinctly, the disdain and indifference shown for indigenous technologies, coupled with the callous and 'Chalta Hai' attitudes of administrators and decision makers in India, are the real stumbling blocks for India to leap frog to greater heights.

In short, if we ignore and choose not to encourage and facilitate homegrown indigenous technologies demonstrated for their superior capabilities, we would be risking and abetting the sustenance of the acronym SNAFU (Situation Normal, All Fouled Up), and the proliferation of the use of the epithet 'flying coffins' for our military aircrafts.

A LOOK BACK AT 2021 SHOWS THAT THE AVIATION INDUSTRY MUST INCLUDE SUSTAINABILITY IN ITS EVOLUTION.

Introduction

The UK aviation industry has adopted the Sustainable Aviation long-term strategy to ensure a brighter, cleaner, quieter, and more efficient future for our sector. To keep up with rapidly shifting regulations and travel requirements in 2021, the air transportation industry has been forced to adapt nearly every aspect of operations, from health

status verifications to fluctuating border controls based on virus hot spots and the appearance of new Covid-19 variants such as Omicron.

An unusual cold freeze in Texas, and record heatwaves in Canada, have also marked this year. In the final days of 2016, the COP26 conference outlined the massive amount of work that must be done quickly to avert catastrophic climate change.

The CEO of SITA for Aircraft Sebastien Fabre examines these five crucial travel technology developments and is expected to alter the industry by 2022 and beyond. He argues that sustainability should be incorporated into today's vital industry change.

The future of the sector depends on automation and digital health.

Covid-19's IT budget cuts haven't dampened expenditure on passenger processing automation at airports and airlines. Covid-19 variations continue to pose new problems for the business, and while many obstacles must be addressed to encourage international travel, the need for low-touch and efficient operations only rises. Automated and digital systems are essential for passengers to have the confidence and control they need to travel effectively and to minimize processing times to an acceptable level. Airports throughout the world are investing in future-proofing their operations using biometric technologies.





We must standardize and digitalize health verification in addition to automating passenger processing to enable more accessible, safer, and more seamless travel in light of persistent health problems. According to the Digital Travel Declaration announcement of 2021, the company plans to make its digital travel declaration solution accessible free of charge worldwide to assist in the recovery of the industry. Health paperwork submission and verification remains a key roadblock for the global travel industry's recovery, an effort to solve this issue.

Efforts to improve airport efficiency and reduce environmental impact will be coordinated.

Airports' economic strategies are being forced to adapt quickly in light of the pandemic's unpredictable impact on the environment. Airports will have to cut costs, increase auxiliary income, and be flexible to meet the demands of variable passenger traffic. Because of this, cloud computing is a major investment sector. Although most airports are also planning to deploy business intelligence solutions, concentrating on areas like flight operations and asset management, they are also looking to understand their operations better.

Airports may also make a big impact on the environment through operational efficiency. According to ACI's statistics, in Europe, 235 airports have committed to net zero emissions by 2050, and more than 90 airports have now committed to net zero emissions by 2030. To assist these airports in reaching their sustainability objectives, the Aviation industry and Envision Digital have teamed up to develop a solution combining airport operations optimization with energy consumption optimization for infrastructure to minimize local emissions.

Airports are focusing on decreasing Scope 1 and 2 emissions in response to COP26 and increased passenger demand for more sustainable travel. Airports have taken steps to reduce their environmental footprint, including green spaces, renewable energy sources (such as solar panels and wind turbines), and widespread recycling facilities. Innovative building technologies and automation have also been adopted. Airlines are increasingly interested in IT that helps them print more sustainably, recycle IT equipment at the end of life, and promote energy savings. Aviation operations and infrastructure improvements may lower emissions by up to 10%, according to industry data.

- **The pressure on airlines to be more environmentally friendly will continue.**

Significant fuel and CO₂ emissions savings of up to 10% during the flight phase are now possible in the air. Pilots and dispatchers may benefit from real-time access to precise multi-source weather information because of the power of technology. Using today's technology, pilots can enhance the safety and comfort of their flights by maximizing fuel economy, decreasing carbon emissions, and increasing situational awareness. A wide range of dangers, such as thunderstorms, lightning, clear air turbulence, high winds, ice, and even volcanic ash, may be detected with eWAS Pilot's precise 4D weather predictions and real-time updates from several sources. Flight routes that avoid bad weather can be determined dynamically using this information.

- **It's a squandered chance to address climate change by providing airline bailouts.**

The International Air Transport Association (IATA) predicts a total net loss of \$118.5 billion for 2020 in the worldwide airline sector. As a result of COVID-19 rescue packages, airlines throughout the world have received \$123 billion in government assistance.

However, governments throughout the globe had an excellent chance to enforce environmental measures as part of bailout conditions, but only a handful chose to do so.

US COVID-19 rescue measure (CARES Act), for example, paid \$50 billion to US airlines last year to keep them afloat. Even though American airlines have a significantly greater carbon impact than those in other countries, the bailout did not specify explicit environmental criteria.

However, many airlines in the United States have already made steps to minimize their carbon footprints. Delta Air Lines said early in 2020 that it would contribute \$1 billion over the next decade to reduce all emissions from its global operations going forward. CEO Ed Bastian of Delta acknowledged that the airline is continuing to invest in innovation, improving clean air transport technology, reducing carbon emissions and waste, and setting up new programs to reduce the balance of emissions in his keynote talk at last year's FTE APEX Virtual Expo.

In Europe, airlines that have agreed to environmental restrictions to secure bailouts from their governments are feeling the heat from the public.

France's government, for example, gave Air France a €7 billion grant to make it "the world's most ecologically responsible airline," with strict environmental criteria attached to the funding. Reducing carbon emissions, cutting domestic flights, and switching to alternative fuels are among the prerequisites.

According to Air France's Horizon 2030 strategy, the company wants to reduce its carbon footprint by half by 2030. As part of that, it has ordered 60 Airbus A220-300 aircraft to gradually replace its ageing Airbus A319 and a319 fleet and take delivery of 28 Airbus a350-900 aircraft, the first of which



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has already joined the carrier's fleet and retiring its Airbus A380 fleet by 2022.

When it comes to ensuring that travelers are satisfied, travel businesses should prioritize a few areas:

- **The travel industry is on the verge of a massive expansion. However, is the industry prepared?**

If all goes well, we might be on the verge of a new era of travel. Travelers in various regions of the world are likely to resume their journeys soon, given to improving

vaccination rates and manageable caseloads, despite the presence of COVID-19 variations. Reopening borders and easing travel restrictions have begun in several nations cautiously.

Travel is expected to return with a vengeance as the effects of the COVID-19 epidemic fade, as people want to reconnect, discover new places, or revisit old favorites. A lot of people just want to get out of the house. Traveling is ranked as the second most popular activity among respondents in a McKinsey poll (in the first place: dining out). US air traffic has surpassed two million passengers a day in the United States; this figure is closer to the pre-pandemic level (about 2.5 million) than the low (approximately 90,000). The number of people making hotel and auto rental reservations is increasing.

- **The tale of two trip recuperation methods**

Everywhere you turn, you'll find folks who are desperate to explore the globe. The majority of high-earners have not been laid off. In the United States, this demographic's savings rate has increased by 10 to 20 percent since the epidemic, and they are ready to spend their funds on vacation. Travel for pleasure is likely to lead the recovery, followed by business travel.

According to an International Air Transport Association (IATA) poll of 4,700 people from 11 countries, 57 percent

anticipate traveling within two months after the pandemic's containment, and 72 percent will do so as soon as they can meet up with friends and loved ones. Even though China's borders remain closed, a record number of people in our study said they want to take a vacation outside the country; 41% say they want to travel outside China on their next vacation, the largest number yet.

However, it's important to emphasize that nation will likely implement their intentions to reopen in a variety of ways. COVID-19 caseloads and immunization rates are the primary issues here. Some nations, such as those in Africa and Southeast Asia, will continue to impose travel restrictions for some time to come due to their restricted availability of vaccines and uncontrollable numbers of cases.

SaaS cloud-based airport management capabilities are crucial for these airports to balance passenger pleasure, capacity, and profitability while enabling collaborative procedures and decisions. Having unified digital systems that ease the passenger trip across the land, sea, and air will become increasingly crucial as transport becomes more integrated and multimodal.

- **Air transport will benefit greatly from the use of blockchain technology.**

Blockchain technology is presently going through a period of maturation in which its actual benefits are becoming more

apparent. It is still not easy to make use of the benefits in an acceptable use case when this technology is the best answer.

As a result of the various collaborations amongst service providers in the aviation sector, the supply chain for travel goods and services is designed to be highly collaborative. Business-to-business transactions might benefit greatly from the use of smart contracts. Specifically, Invoicing, settlement, and accounting operations can be disrupted.

There are a significant number of organizations involved in the supply of travel products and services, which may be seen as a single product from a customer's perspective in the commercial aviation business. To achieve their goals, these players frequently work together and form alliances to deliver value and satisfy customer expectations together. Passengers begin searching online as soon as they arrive at the airport.

There are roughly 26 other businesses involved in the process of purchasing a plane ticket to and from the airport.

Conclusion

"Innovation in Aviation = Value Added for New Mobility" will demonstrate how aviation promotes and changes mobility and affects development through state-of-the-art technology, creative solutions, and new developing modes of transportation

in aviation. The "innovation in aviation" discussion will show that aviation improvements have a wide-ranging influence on other sectors and forms of transportation. To achieve sustainable mobility, all forms of transportation must work together to solve the present transportation system's inefficiencies holistically, as well as evaluate and coordinate the deployment of new technologies.

For a little more than a century now, our industry has progressed from just learning to fly an aircraft to flying faster, flying longer, and flying bigger planes. Now we have 100,000 or more daily commercial flights – or 400 departures per hour – taking place worldwide. One of today's most reliable types of transportation is aviation, which has been at the cutting edge of technological advancement.

The 2030 Agenda for Sustainable Development and the entire transportation industry will be impacted by this wave of aviation technologies. In the future, we'll be able to move people and packages using these notions, as well as a host of other new technologies.

Everybody must connect and collaborate to take advantage of these breakthroughs if we want this future to become a reality.

It's like a rocket blasting off in the future of transportation!



Jill Albertelli Succeeds Matthew Bromberg as President of Pratt & Whitney Military Engines

Pratt & Whitney has named Jill Albertelli President of its Military Engines business, succeeding Matthew Bromberg, who has elected to leave the company to pursue other opportunities. Albertelli, most recently Pratt & Whitney's Senior Vice President of Transformation and Strategy, will lead the Military Engines organisation effective December 6, and will work closely with Bromberg through the end of this year to ensure a smooth transition.

Albertelli brings a history of demonstrated excellence in a broad range of leadership roles to Military Engines, with experience in roles of increasing importance in engineering, operations, programme management, sales, commercial aftermarket and product quality. Most recently, she led the company's Transformation and Strategy organisation, including overseeing digital technology, the building of Pratt & Whitney's world-class turbine airfoil production facility set to open in 2022, in Asheville, N.C., and leading the company's innovative Office of the Future initiative, with 80% of headquarters salaried staff afforded greater flexibility in work-remote options.



Rolls-Royce appoints Sarah Armstrong as Chief People Officer

Rolls-Royce announces that Sarah Armstrong will take up the post of Chief People Officer with effect from 1 January 2022, providing strategic leadership of our People agenda. She will join the Executive Team from Civil Aerospace, where she was most recently People Director and instrumental in delivering our restructuring programme. Sarah replaces Harry Holt who leaves the business at the end of the year, following the announcement of his departure on 5 October. Separately, Ben Story, Strategic Marketing Director, has decided to leave us, after five years on the Executive Team, to pursue new opportunities.

Warren East, CEO, Rolls-Royce, said: "Sarah has held many senior positions during her 15-year career with Rolls-Royce, providing great organisational leadership and delivering innovative people initiatives. I look forward to welcoming her to the Executive Team. I would also like to wish Ben well in his next endeavours. He was attracted to Rolls-Royce by the opportunity to help drive change across the Group and in the last five years we have renewed our brand, vision and strategy and we are now well-positioned to lead the transition to net zero as a global power group and to benefit from greater digitalisation. I am grateful for the central role that Ben has played in bringing about these changes."

Director General VS Pathania took over as Chief of Indian Coast Guard

Director General VS Pathania, PTM, TM took over as the 24th Chief of Indian Coast Guard on December 31, 2021. The Flag Officer is an alumni of the Defence Services Staff College, Wellington and National Defence College, New Delhi. The Flag Officer is a qualified helicopter pilot and holds a Master's Degree in Defence & Strategic Studies from the University of Madras. He has also undergone specialization in Search and Rescue and port operations with US Coast Guard.

In his illustrious career spanning over 36 years, The Flag Officer has held several key appointments afloat and ashore, prominent among them are Commander Coast Guard Region (North West) at Gandhi Nagar, Commander Coast Guard Region (West) at Mumbai, Deputy Director General (HRD), Deputy Director General (Policy & Plans) at Coast Guard Headquarters, New Delhi. The flag officer has also commanded all class of Coast Guard ships namely Inshore Patrol Vessel 'Ranjindan', Offshore Patrol Vessel



'Vigraha' and Advanced Offshore Patrol Vessel 'Sarang'.

The flag officer has also held various appointments viz Principal Director (HRD),

Principal Director (Policy & Plans) at Coast Guard Headquarters, New Delhi, Chief of Staff at Headquarters, Coast Guard Region (North West), Chief Staff Officer (Operations) and Chief Staff Officer (Personnel & Administration) at Headquarters Coast Guard Region (West), Commanding Officer, Coast Guard Air Station at Chennai, Director (Personnel) and Joint Director (Aviation) at Coast Guard Headquarters and also as Squadron Commander of 848 Sqn at Chennai.

The Flag Officer was elevated to the rank of Additional Director General in Nov 2019 and took over the reins as Coast Guard Commander (Eastern Seaboard) at Visakhapatnam. The period under his apex watch on Eastern Seafront saw surge in major operations that included apprehension of gold and tons of drugs/narcotic substance worth thousands of Crores, pollution response operations, joint exercises with Foreign Coast Guard, anti-poaching operations, mass rescue operations and humanitarian assistance during cyclones/natural calamities and strengthened Coastal Security.

The Honorable Kelly A. Ayotte elected Chair of BAE Systems, Inc. Board of Directors

BAE Systems announced that former U.S. Senator and current board member Kelly A. Ayotte was elected as the new Chair of the BAE Systems, Inc. Board of Directors for a three-year term. Ayotte was first appointed to the BAE Systems, Inc. Board in June 2017.

"As a board member, Senator Ayotte's substantial experience in national defense and security have helped guide our work to support our customers' most critical missions," said Tom Arseneault, president and CEO of BAE Systems, Inc. "We look forward to the leadership and stewardship she will provide in this expanded role as Chair of our Board."

She succeeds former Secretary of Homeland Security Michael Chertoff, whose term as Chair of the BAE Systems, Inc. Board concludes this month. Chertoff has served as Chair since April 2012 and as a member of the Board since May 2010.

Charles Woodburn, group chief executive of BAE Systems plc, said, "We are deeply grateful for Secretary Chertoff's contributions to BAE Systems. His distinguished leadership as Chair has helped our Company, our customers, and our allies navigate through a time of increasingly complex global security challenges."



Raytheon Technologies appoints Raja Maharajh as general counsel

Raytheon Technologies announced that Raja Maharajh has been appointed as general counsel of Raytheon Technologies and will report directly to Chairman and Chief Executive Officer Greg Hayes. "Raja brings decades of legal experience to the general counsel role and has served as a trusted advisor to myself and the senior leadership team," Hayes said. "He is a proven leader, partnering across global teams to achieve results for our company and our customers. In his new role, I'm confident Raja will continue to advance our business objectives in alignment with our values."

Maharajh replaces Frank Jimenez, who has decided to pursue new opportunities outside of Raytheon Technologies. "We appreciate Frank's legal guidance and expertise, especially as we completed our merger, and we wish him the best," Hayes continued. As general counsel, Maharajh will serve as a member of the senior leadership team, overseeing a variety of legal and regulatory affairs, including corporate governance and transactions, ethics and compliance, litigation, contracts and intellectual property.

Maharajh has been with the company since 2004 and has held a variety of leadership roles, including chief of staff to the chairman and CEO and general counsel of Pratt & Whitney. Prior to joining the company, Maharajh was an attorney for Bazerman & Drangel, P.C., where he focused on intellectual property and commercial litigation matters. He started his career as a manufacturing engineer at Maidenform, Inc. Maharajh has a Juris Doctorate from Seton Hall University of Law and a Bachelor of Science degree in Industrial Engineering from the New Jersey Institute of Technology.



SP Shukla elected President of SIDM for 2021 – 2023

Mr SP Shukla was elected President of SIDM for the term of 2021 – 2023 by the SIDM Executive Council. Mr SP Shukla served as Vice-President of SIDM from 2019 – 2021.

Mr Shukla is among the topmost industry leaders in India with over 4 decades of rich, varied experience in managing large projects and operations across diverse industries, including the Defence & Aerospace sector. His academic qualifications include B Tech (IIT) and MBA (IIMA).

Currently, Mr Shukla is the Chairman of the Boards of several companies in the Defence & Aerospace sector of the Mahindra Group including Mahindra Defence Systems, Mahindra Aerostructures and Mahindra Telephonics etc. His responsibilities include companies in other sectors also. He serves as the Chairman of Mahindra EPC Micro Irrigation, Mahindra CIE Automotive, and Mahindra Sanyo Special Steels.

Statement from Mr Shukla:

"I thank Mr Jayant D Patil for his leadership as President of SIDM from 2019 – 2021. During his tenure, the Society has grown tremendously in its stature and has made a positive impact in strengthening India's journey towards 'aatmanirbharta' in Defence production"

We have witnessed several important policy decisions in the last few years which have created a sound environment for growth of the Industry. The policies have aptly addressed the industry concerns and have catalysed the growth of Startups and MSMEs whose development is crucial for new-age technologies.

It will be my endeavour to continue this momentum where SIDM works closely with the Ministry of Defence, Services, DPSUs and International stakeholders to put forth Industry views. SIDM will encourage and promote initiatives for strengthening our collective movement towards Make in India."

Hopeful of international lessors starting their operations for commercial Aircraft leasing in India

Amit Mittal AVP (Aviation & Airlines) of Bank of Baroda



'Aviation Banker' is something our dear readers never might have heard of. Could you explain in detail what it is and how it feels to be India's only Aviation Banker?

I have been in the Aviation industry for around 16 years, having experience

and exposure across domains like Aviation financing and Aircraft Leasing, Aircraft Sales and acquisition Advisory, Asset management, Airport Management, MRO, Pilot training Simulators and Ab-Initio Pilot training. So it's a combination of Technical, Commercial, Management and Financial aspects. As I am with Bank of Baroda, we

have been doing banking in the Aviation and aerospace sector here. So, this term "Aviation Banker" is an appropriate description of my unique role in the industry.

How did your management degree and your previous work experience help you to earn this label?

My management experience over the years has kept me involved in the aviation industry and seen it evolve over these years; it is combined with my international exposure in the Aviation fraternity with US, Europe, China, UAE, SE Asia etc. and thus it gives me a good understanding of managing relationships up to executive C level across Airlines, Airports, Aircraft OEM's, Aerospace suppliers and various industry stakeholders as well as policy makers.

What can you say about Indian Aircraft leasing industry? What can be the reasons that left this industry so far behind when compared to international markets?

Indian Aircraft leasing industry is slated to pick up and evolve, due to good developments and initiatives like the IFSC in GIFT City, with which I have been associated closely since a long time. As things move forward, we are hopeful that international lessors may start their operations here for commercial Aircraft leasing. It is a good sign

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As things move forward, we are hopeful of international lessors to start their operations here for commercial Aircraft leasing



that some business aircraft and helicopters transactions have happened in the Indian aircraft leasing industry.

It will be more appropriate to say that we have started focusing on Aircraft leasing from India only in recent years as compared to international markets. So we are not left behind but rather taking progressive steps to develop aircraft leasing from India.

However, in order to make Indian Aircraft leasing viable, my observation is that we need to address issues such as: Cost of raising funds from international markets by Indian lessors in competition to international lessors, Banking regulations, Speediness of Indian jurisdiction, Cape Town convention, Appetite of the banks for doing such transactions, Incentives to Airlines and Business Aviation operators to foster and avail Indian Aircraft leasing etc. It is important to consider setting up an Aviation Financing and Leasing Fund in India.

What kind of impact was left on Aviation financing due to the outbreak of pandemic? With the recent developments like the revival of Jet, change of Air India's ownership and Akasa Air's takeoff, can we witness the positive vibes in financing as well?

From the Aviation financing point of view, the pandemic has impacted the Aircraft lessors, Aviation financiers, Aircraft Lease rates, Aircraft CMV, Aircraft insurance, Impairments, slowed aircraft deliveries, it has led to consolidation and mergers of Aircraft lessors, and resulted Aircraft in parking and storage of aircraft for some time.

There have been new developments in Aviation Capital markets, ABS, EETC etc. The Aircraft leasing and financing market is bound to pick up and grow, because fundamentals in long run are intact. New Aircraft orders are reviving and demand for air travel will always be there. It is reflected in return-to-service of aircraft, re-starting of erstwhile routes, and newer routes by airlines, particularly in long haul international sectors. Steadily, the industry will chart its own course in growth as processes, systems and travel protocols will mature, and vaccinations for Covid are being accomplished worldwide.

“Steadily, the industry will chart its own course in growth as processes and systems, vaccinations for Covid are being accomplished worldwide

The revival of Air India, Jet Airways and Akasa ordering new Aircraft are interesting developments which is stimulating for Aircraft leasing, Aviation Financing etc. based on commercial and business aspects, as I see it at this stage. As things pan out it opens up a new market as more aircraft and airlines take to the skies.

Indian Aviation is ready to embrace the transformations lately. What could be such changes Aircraft leasing industry is experiencing now?

Aircraft leasing industry could see new breed of aircraft lessors and Banks in India to foray in Aviation financing and leasing. One of the ways is to have a dedicated Aviation and Aerospace financing subsidiary or aviation practice by banks. International banks may set up their Aviation financing departments here as they do abroad. Tweaking of the rules, regulations etc. to support this may be required to enable fostering and steady growth here.

Welcoming the New Year 2022, your cheering message for our fellow aviators would be..?

As an experienced Aviation and Aviation Financing professional, I have seen the industry evolve and grow since for almost 2 decades now. Witnessed and worked in Aviation since the starting of LCC Airlines, new age Airports, Aerospace industry, MRO, Pilot and AME training etc. So I have seen mergers, consolidations, divestments, aviation projects very closely.

My message is that we are a fundamentally strong economy, Air travel is the preferred choice of the millennials, aircraft deliveries and orders will be on trajectory in spite of pandemic related scenario, so the Aviation industry is here to stay. Air travel, new airports across India and across Asia, Aerospace manufacturing, Drones, Pilot training, MRO will all grow in due course, just that we have to show perseverance.

Maintain the flight path fellow aviators and we shall come out of turbulence.

Amit Mittal is currently AVP (Aviation and Airlines) at Bank of Baroda. The views expressed here are personal.

NASA's James Webb Space Telescope Lifts Off with Advanced Camera from Lockheed Martin

With the liftoff of NASA's James Webb Space Telescope from French Guiana, humankind is one step closer to seeing the universe in a whole new light, with help from a camera built by Lockheed Martin. The instrument will be key in giving the telescope its first glimpse of celestial light. The Near Infrared Camera (NIRCam) is Webb's primary imager and one of the most sensitive infrared cameras ever built. As the telescope sets itself up in space, NIRCam will help align Webb's intricate array of mirrors. It will then take science images throughout the entire mission.

"NIRCam's journey is over two decades in the making, and seeing it lift off into space on Webb was the culmination of many years of hard work with Marcia Rieke and our University of Arizona partners," said Alison Nordt, Lockheed Martin's Space Science and Instrumentation Director, who led development of NIRCam. "Webb will rewrite the science books of how we understand our universe, and to have Lockheed Martin-built technology help advance the future of space imaging is an honor."

The Lockheed Martin and University of Arizona team designed, built and tested NIRCam out of the company's Advanced Technology Center in Palo Alto, California.

How to look at the Universe's Oldest Light

Webb is designed to peer at the universe's oldest light, which scientists believe occurred around 13.5 billion years ago. As the universe expands, those light waves that were once visible have now shifted into the infrared spectrum. This light is incredibly far away and extremely dim, which is why Webb requires large mirrors – along with NIRCam's ultra-precise optics – to see it.

Before that can happen, NIRCam's first job is to sense incoming infrared light and take images that will help the telescope's systems properly align its 18 primary mirror segments. This is critical to ensuring Webb provides crystal clear images once it enters science mode.

The Technology Behind NIRCam

For Webb's mirror alignment in early 2022, NIRCam senses what's called a "wavefront," or an ideally perfect sphere of light particles emitted from any luminescent object. When those particles encounter another object – in this case, the telescope's optics – they become distorted. NIRCam measures those distortions with nanometric

accuracy, and that data is then used to advise how Webb's mirrors must adjust. This iterative process is done until the telescope's mirrors are properly aligned.

With Webb traveling more than 1 million miles from Earth into space, NIRCam must function with extreme precision and stability in temperatures as cold as -400°F. In fact, the telescope needs frigid temperatures to ensure infrared radiating off the observatory doesn't overwhelm the images. To enable operations in such extreme conditions, Lockheed Martin developed a new technique for bonding NIRCam's optical lenses to their mounts. The innovative method ensures the cold and launch vibrations don't cause shifts in alignment of NIRCam's lenses.

After more than a decade of meticulous engineering and rigorous testing, the team delivered one of the most capable infrared instruments ever created, and NIRCam was fully integrated onto Webb in 2014. Now, the telescope gets situated for a decade of ground-breaking observations to shape how we see space for years to come.

More About the Mission

The Webb Space Telescope is the world's newest premier space science observatory. It will solve mysteries in our solar system, look beyond to distant worlds around other stars, and probe the mysterious structures and origins of our universe and our place in it. Webb is an international program led by NASA with its partners – the European Space Agency and the Canadian Space Agency – and industry participation from many companies, including Lockheed Martin.



Nanoracks, Voyager Space, and Lockheed Martin Awarded NASA Contract to Build First-Of-Its-Kind Commercial Space Station

Nanoracks, in collaboration with Voyager Space and Lockheed Martin, has been awarded a \$160 million contract by NASA to design its Starlab commercial space station as part of the agency's Commercial Low-Earth Orbit (LEO) Development program. Starlab will enable NASA's initiative to stimulate the commercial space economy and provide science and crew capabilities prior to the retirement of the International Space Station (ISS), according to a Lockheed Martin statement issued on December 2.

"While today marks a major milestone for Nanoracks and our Starlab team, the impact goes far beyond this award," said **Dr. Amela Wilson, CEO at Nanoracks**. "To receive this support from NASA validates over a decade of Nanoracks' hard work forging commercial access to space, bringing over 1300 commercial payloads from 30 nations to the ISS. This opportunity opens far-reaching possibilities for critical research and commercial industrial activity in LEO. We are honored to be selected as one of three awardees to work with NASA, and we cannot wait to bring our existing global commercial customer base to Starlab."

The initial \$160 million award to Nanoracks is made via a funded Space Act Agreement through 2025. This initial NASA-provided funding will be supplemented with customer pre-buy opportunities and public-private partnerships. Fully owned by Nanoracks, Starlab is planned to reach initial operating capability in 2027, which ensures continuous human presence in LEO by US entities. NASA will have the opportunity to purchase crew and payload services on Starlab through separate services contracts with Nanoracks.

Nanoracks has unparalleled commercial experience on the ISS. Joined by Voyager Space's sophisticated investment strategy and expertise in operational integration and Lockheed Martin's engineering knowledge and strategic vision, the Starlab team

presented a formidable program for the future of LEO commercialization.

The basic elements of the Starlab space station include a large inflatable habitat, designed and built by Lockheed Martin, a metallic docking node, a power and propulsion element, a large robotic arm for servicing cargo and payloads, and the George Washington Carver (GWC) Science Park. The GWC Science Park is a state-of-the-art laboratory system which will host a comprehensive research, science, and manufacturing capability. Starlab will have the capacity to continuously host up to four astronauts to conduct critical science and research.

"Starlab is the confluence of Lockheed Martin's rich space expertise and history, Nanoracks' innovation, and Voyager's financial savvy. This team is equipped to aid NASA on its mission to expand access to LEO and to enable a transformative commercial space economy," said **Lisa Callahan, Vice President and General Manager, Commercial Civil Space at Lockheed**

Martin.

Nanoracks will prime Starlab's development leveraging over a decade of experience as the pathfinder and global leader in commercial ISS utilization. Voyager Space, the majority shareholder in Nanoracks, will lead strategy and capital investment, and Lockheed Martin, a leader in developing and operating complex space technology, will serve as the technical integrator of the new advanced space station.

"Starlab's impact on space commercialization cannot be understated," said **Dylan Taylor, Chairman and CEO at Voyager Space**. "Today we are witnessing a major economic shift, where space businesses are tangible, well capitalized, and commercially sustainable. It takes a planet to explore the universe, and we invite the global community to be part of Starlab's success."



BEL receives biggest avionics order ever from HAL for LCA Tejas Fighter Aircraft programme

The LCA Tejas Mk1A programme got a shot in the arm as Bharat Electronics Ltd (BEL) received an order worth Rs. 2,400 Crores from Hindustan Aeronautics Limited (HAL) for the manufacture and supply of 20 types of airborne electronic systems to be fitted on the fighter aircraft.

The order was received by Mr Manoj Jain, General Manager (EW&A)/BEL-Bengaluru from Mr E P Jayadeva, General Manager (LCA Tejas), HAL, in the presence of Mrs Anandi Ramalingam, CMD, BEL, and Mr R Madhavan, CMD, HAL.

The order spanning five years from 2023 to 2028 involves supply of critical avionic Line Replaceable Units (LRUs) related to Digital Flight Control Computers, Air Data Computers, Weapon Computers, LRUs related to Radar Warning Receiver (RWR) and Head Up Display. The LRUs have been indigenously designed and developed by Aeronautical Development Agency (ADA), DRDO Labs, Aeronautical Development Establishment (ADE), Combat Aircraft Systems Development and Integration Centre (CASDIC) and Central Scientific Instruments Organisation (CSIO).

This is the biggest ever order received by BEL for Avionic Systems and will go a long way in ensuring the Indian Air Force's Air Superiority and giving a boost to the Hon'ble Prime Minister's vision of an 'Atmanirbhar Bharat'.

The order for supply of Avionic Systems for 83 Tejas MK1A fighter aircraft will be executed by two Strategic Business Units (SBUs) of BEL: Electronic Warfare & Avionics, Bengaluru, and BEL- Panchkula, Haryana. All the systems will be delivered by BEL to HAL in a ready-to-board condition.

Mrs Anandi Ramalingam, CMD, BEL, said: "We are pleased to receive this order from HAL for the prestigious LCA Tejas Fighter aircraft programme. It will give a big boost to the Government of India's indigenisation drive. BEL is all geared up to supply the critical Avionics LRUs as per the delivery schedule. We look forward to continue our strong partnership with HAL for more such programmes."

Mr R Madhavan, CMD HAL, congratulated BEL for the order and said: "The LCA Tejas programme is an excellent example of the synergy between eminent Indian Defence establishments such as HAL, DRDO and BEL. The current order for the development and supply of 20 types of critical Avionics LRUs for Tejas Mk1A is a shot in the arm for the Make in India and Atmanirbhar Bharat initiatives of the Government of India."



Indigenously Developed Armoured Engineer Reconnaissance Vehicle Inducted into Indian Army



The first set of indigenously developed next generation Armoured Engineer Reconnaissance Vehicle was inducted into the Corps of Engineers of Indian Army in a solemn function attended by Gen MM Naravane, the Chief of Army Staff at Pune.

The system has been designed by Defence Research and Development Organisation (DRDO) and manufactured by Ordnance Factory Medak & Bharat Electronics Limited, Pune. Despite the various restrictions imposed by the COVID pandemic since the last one year, supply of the vehicle to Indian Army has been on schedule. The vehicle is capable of carrying out reconnaissance of water obstacles and boggy patches for execution of engineer tasks with capabilities to carry out reconnaissance and provide real time update to force commanders. The system will enhance existing engineer reconnaissance capabilities of Indian Army and would be a major game changer in support of mechanised operations in future conflicts.

DRDO conducts flight demonstration of Controlled Aerial Delivery System

Aerial Delivery Research and Development Establishment (ADRDE), Agra conducted a flight demonstration of Controlled Aerial Delivery System of 500 kg capacity (CADS-500) on December 18, 2021. ADRDE, Agra is an R&D laboratory of Defence Research and Development Organisation (DRDO) and the flight demonstration is part of a series of activities organised towards celebrating 'Azadi Ka Amrit Mahotsav', commemorating 75 years of Independence.

The CADS-500 is used for precise delivery of payload upto 500 kgs at predetermined location by making use of manoeuvrable capabilities of Ram Air Parachute (RAP). It uses Global Positioning System for the coordinates, altitude and heading sensors for the heading information during its flight. The CADS, with its onboard electronics unit, autonomously steers its flight path using waypoint navigation towards target location by operating controls.

System performance was demonstrated at Drop Zone, Malpura from an altitude of 5000m. The system was para-dropped from AN32 aircraft and then steered to the pre designated landing point in autonomous mode. Eleven paratroopers of Indian Army and Indian Air Force chased the CADS-500 in air and landed simultaneously.



Air version of BrahMos supersonic cruise missile successfully test-fired from Sukhoi 30 MK-I off Odisha coast



An air version of the BrahMos supersonic cruise missile was successfully test fired from a Sukhoi 30MK-I supersonic fighter aircraft at 1030 hrs from Integrated Test Range, Chandipur off the coast of Odisha on December 8. In the copybook flight, the missile followed the pre-planned trajectory, meeting all mission objectives.

“The launch is a major milestone in the BrahMos development. It clears the system for the serial production of air-version BrahMos missiles within the country,” the Defence Ministry said.

“Major airframe assemblies which form the integral part of the ramjet engine are indigenously developed by Indian Industry.

These include non-metallic air frame sections comprising ramjet fuel tank and pneumatic fuel supply system. During the test, the structural integrity and functional performance have been proven,” the Ministry said.

The air version of BrahMos was last flight tested in July 2021. Defence Minister Rajnath Singh has praised the Defence Research and Development Organisation (DRDO), BrahMos, Indian Air Force and the industry on the successful test firing. Congratulating the teams involved in the flight test, Secretary Department of Defence R&D and Chairman DRDO Dr G Satheesh Reddy said various laboratories of DRDO, academic institutions, quality assurance & certification agencies, Public Sector Undertakings and Indian Air Force participated in the development, testing, production and induction of this complex missile system.

BrahMos is a Joint Venture between India (DRDO) and Russia (NPOM) for the development, production and marketing of the supersonic cruise missile. BrahMos is a potent offensive missile weapon system already inducted into the Armed Forces.

New generation ballistic missile ‘Agni P’ successfully test-fired by DRDO

Defence Research and Development Organisation (DRDO) successfully tested the new generation nuclear capable ballistic missile ‘Agni P’ from Dr APJ Abdul Kalam Island off the coast of Odisha on December 18, 2021. Various telemetry, radar, electro-optical stations and down range ships positioned along the eastern coast tracked and monitored the missile trajectory and parameters. The missile followed text book trajectory meeting all mission objectives with high level of accuracy.

The Agni P is a two-stage canisterised solid propellant ballistic missile with dual redundant navigation and guidance system. This second flight-test has proven the reliable performance of all the advanced technologies integrated into the system.

RM Shri Rajnath Singh congratulated DRDO for the successful flight test and expressed his happiness for the excellent performance of the system. Secretary Department of Defence R&D and Chairman DRDO Dr G Satheesh Reddy appreciated the efforts of the team to have done the second development flight trial with many additional features and congratulated for the consecutive success within the same calendar year.





Indian Air Force signs MoU with IIT Delhi to accelerate indigenisation efforts

Indian Air Force and IIT Delhi signed a MoU on December 9 for various developmental projects to support the requirements of IAF. The MoU was signed by Air Vice Marshal Samir V Borade VSM, Deputy Senior Maintenance Staff Officer (Dy SMSO), Headquarters Maintenance Command, IAF and MR Ravi, Head of the Department of Mechanical Engineering at IIT-Delhi.

Joint Partnership between IAF and IIT Delhi aims to accelerate IAF's indigenisation efforts for achieving self-reliance. Under the ambit of the MoU, IAF has identified key focus areas involving technology development and finding indigenous solutions towards sustenance of various weapon systems. IIT Delhi will provide cooperation and consultancy, duly supported by research, for feasibility studies and prototype development.

The partnership between IAF & IIT Delhi will significantly boost the efforts by Base Repair Depots (BROs) of Maintenance Command IAF, towards enhancing sustenance capability, obsolescence management, indigenisation and achieving self-reliance.

HAL Bags ADE-DRDO Supply Order for ABHYAS Target Platform

HAL has secured an order for manufacturing, assembly, integration, testing and supply of High Speed Expendable Aerial Target (HEAT) System known as ABHYAS from Aeronautical Development Establishment, DRDO, recently. Post successful completion of this initial order, HAL would be identified as Development cum Production Partner (DcPP) for supply of this target system along with a private firm (50% of the volume). The platform is estimated to have large requirement from the tri-services, DRDO laboratories for evaluation trials of missile programs. ABHYAS was first successfully flight-tested in May 2019 and subsequent evaluation trials are being conducted by ADE- DRDO. This order would mark the beginning of series production of ABHYAS.

About ABHYAS: It is designed and developed by DRDO's Aeronautical Development Establishment (ADE), Bengaluru. The air vehicle is launched using twin under-slung boosters which provide the initial acceleration to the vehicle. It is powered by a gas turbine engine to sustain a long endurance flight at subsonic speed. The target aircraft is equipped with Micro Electro Mechanical System (MEMS) based Inertial Navigation System (INS) for navigation along with the Flight Control Computer (FCC) for guidance and control. The vehicle is programmed for fully autonomous flight. The check-out of air vehicle is done using laptop-based Ground Control Station (GCS).



ABACE China show cancelled for 2022

The National Business Aviation Association (NBAA) and the Shanghai Airport Authority (SAA) announced the decision to postpone through 2022 the Asian Business Aviation Conference & Exhibition (ABACE), given challenges for exhibitors and attendees due to COVID-19, including travel restrictions. ABACE is held each year in partnership with the SAA, and co-hosted by NBAA and the Asian Business Aviation Association (AsBAA). The event was scheduled to take place in Shanghai, China from 12-14 April.

"As we know, the continued pandemic has prompted governments around the world to institute travel restrictions and requirements, presenting significant logistical and other challenges for exhibitors," said NBAA President and CEO Ed Bolen. "We were hopeful we could have held the event, but the health and safety of all ABACE participants is our highest priority, so we have elected to postpone it through 2022. We will continue to support the resurgence of business aviation in Asia and around the world." Since its launch in 2012, ABACE has become the premier business aviation event in Asia, attracting more than 9,000 attendees from 50 countries.



Airbus delivers world's first H160 in Japan

Airbus has delivered the first ever H160 to Japanese operator All Nippon Helicopter (ANH), heralding a new chapter for this next generation twin-engine helicopter. With 68 patents, the innovative H160 is the world's most technologically advanced helicopter.

The multi-role H160 was delivered from Airbus' helicopter facility in Kobe, Japan, where flight training and specialised equipment installation for electronic news gathering will be performed before the helicopter's entry into service next year.

"It is an honour to have ANH as our very first H160 operator. I would like to thank ANH for their continued trust and confidence in our helicopters. I'm also very proud of the hard work and dedication of our teams in France and Japan in preparation of the aircraft delivery. I can't wait to see this next-generation helicopter flying the skies of Japan, playing a key role in the country's electronic news gathering market," said Bruno Even, Airbus Helicopters CEO.

"ANH is excited to be the first in the world to receive this state-of-the-art H160 helicopter to support our electronic news gathering missions," said Jun Yanagawa, President of ANH. "The electronic news gathering industry is changing rapidly, and we are happy to have the perfect helicopter for our operations, becoming the leading workhorse in our Airbus fleet."



The Helicopter Company expands fleet with the purchase of 26 aircraft from Airbus Helicopters

The Helicopter Company (THC), established by the Public Investment Fund (PIF) as the first and only helicopter services provider licensed to operate commercial flights in the Kingdom of Saudi Arabia announced that it has signed a second purchase agreement with Airbus Helicopters. The agreement was signed by Raid Ismail, Chairman of the Board of THC and Bruno Even, CEO of Airbus Helicopters, in the presence of His Excellency Khalid Al Falih, Minister of Investment and His Excellency Franck Riester, Minister Delegate for Foreign Trade and Economic Attractiveness.

The partnership will contribute to the ongoing expansion of THC's regional fleet ahead of announcing an exciting new journey as a General Aviation champion, with twenty orders of the newly launched five bladed H145 and six ACH160 models. All aircraft feature cutting-edge technologies and biofuel-compatible engines, marking a significant milestone in developing alternatives to conventional aviation fuels and achieving decarbonization of helicopter flights.

Launching its services in 2019, THC was established by PIF as part of its strategy to activate new sectors in Saudi Arabia that support the realisation of Vision 2030 and generate long-term commercial returns, while meeting the growing demand for luxury tourism and air travel services. THC previously signed an agreement to buy 10 Airbus H125 helicopters to increase access to domestic tourism destinations



and provide services such as filming and aerial surveying – and is now further expanding its services with the addition of the H145 and H160 to its fleet.

“Our mission is to create a world-class National Aviation Champion and today, by signing this agreement with our trusted partner Airbus, we mark an important milestone in our journey to grow together with the nation in focus to fulfil Saudi Vision 2030. This deal comes as part of THC's commitment to introduce new services with advanced technology that fulfill market demand and support the development of the Kingdom's wider aviation sector,” said Raid Ismail, Chairman of the Board of THC.

“We are honored by the trust that THC is placing once again in our products and our teams and I am personally thrilled with this expansion of our partnership”, said Bruno Even, CEO of Airbus Helicopters. “THC will be taking full benefit of Airbus' latest innovations with the five-bladed H145 and the ACH160, which we are certain will be valuable assets in their portfolio, enabling them to develop operations in the country,” he added.



Newly launched ACJ TwoTwenty completes first flight

The aircraft will be delivered to Comlux in the coming weeks and then outfitted with a VVIP cabin by COMLUX in Indianapolis, USA after the delivery. Comlux has been selected as an exclusive outfitting partner for the first 15 ACJ TwoTwenty aircraft.

The ACJ TwoTwenty is a new value proposition to business aviation buyers. The innovative solution combines intercontinental range enabling the aircraft to fly up to 5,650 nm/10,500 km (over 12 flight hours), unmatched personal space providing comfort for each passenger with 73m²/785 ft² of floor space. The ACJ TwoTwenty is the only business jet featuring six wide VIP living areas, of around 12m²/130 ft² each and is at a price point of a ULR bizjet.

Equipped with a signature flexible cabin catalogue, this fully completed aircraft is ideal for private and business jet users. Some 200 Airbus corporate jets are in service worldwide, flying on every continent, including Antarctica.

ExecuJet expands Malaysia MRO operations

ExecuJet MRO Services Malaysia, a Dassault Aviation company, is developing a purpose-built MRO facility at Sultan Abdul Aziz Shah Airport in Subang, located near to downtown Kuala Lumpur. ExecuJet has signed a land lease with state-owned Malaysia Airport Holdings Berhad, the operator of Subang Airport, and is now moving ahead with development of the site. Construction of the new purpose-built MRO facility will take approximately 18 to 24 months.

The new purpose-built MRO facility gross floor area will be 144,000 square feet including back shops that further expand ExecuJet's capabilities, as well as offices and customer areas. ExecuJet is currently located at another area of the airport and is already the largest business aviation MRO in Malaysia. It serves Dassault, Bombardier and Gulfstream operators from across the Asia region and is certified by the US FAA, EASA and many other international regulators. The company will relocate to the new, larger MRO facility at Subang Airport to cater for growth.



Regional Vice President Asia for ExecuJet MRO Services Ivan Lim, said: "The new purpose-built MRO facility allows us to continue to develop and expand to meet growing demand from our customers in Malaysia and from across the Asia region. We are steadily growing our highly skilled workforce here in Malaysia and our strong presence at Subang further reinforces Malaysia's status as a leading centre for business aviation and general aviation in the Asia region."

The eighth Gulfstream G650ER aircraft has been delivered to Qatar Executive

Delivery of a Gulfstream G650ER using certified Sustainable Aviation Fuel; Qatar Executive will receive four more Gulfstream G650ERs before the year is out. Using certified Sustainable Aviation Fuel, Qatar Executive welcomed its eighth Gulfstream G650ER from Savannah, Georgia, to Doha, Qatar (SAF).

The arrival of this brand-new cutting-edge Gulfstream G650ER solidifies the company's status as the world's largest owner-operator of this ultra-long-range aircraft. The aircraft's impressive range, industry-leading cabin technology, fuel efficiency, and unmatched passenger comfort have made it one of the most sought-after private jets in the world. With its incredible 7,500 nautical mile range, the Qatar Executive Gulfstream G650ER can fly faster and farther than any other jet of its kind.

"We are proud to be the first global business aviation operator to receive a delivery flight using Sustainable Aviation Fuel," said Qatar Airways Group CEO, HE Akbar al-Baker. Our leadership and commitment to collaborate with the industry to support the deployment of new technology, drive innovation, and encourage the use of SAF at a commercial scale, affordable, and certified" is reaffirmed in this statement.

It is a great honor for Gulfstream to deliver another G650ER for Qatar Executive and to demonstrate our commitment to sustainability," said Mark Burns, president of the company. It is a privilege to have Qatar Executive's trust and we look forward to delivering on our promises as their Gulfstream fleet continues to grow."

In addition to Qatar Executive's long-range and ultra long range aircraft, the G700 will be the latest addition to the company's fleet.





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