

**SPICEJET REPORTS A NET
PROFIT OF INR 23.28 CRORE IN
Q3 FY 2022**

**E195-E2 READIES FOR PORTER
AIRLINES DELIVERY WITH COLD
SOAK TEST**

AVIATION

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UPDATE



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Hello Readers,

Do you know why I have been eagerly waiting for March? Coz I can witness the start of a fresh life with the spring. No, I'm kidding and you know it. And yes its for the Wings India 2022. Unlike the previous edition which was held during the outbreak of pandemic, I strongly believe that this edition will be a huge success bringing all the civil aviation folks to one place. And not to forget the beautiful birds that will be at the display.

Moving onto the contents, quick updates kicks off with a positive vibe with the news concerning Indian Civil aviation. I once again see a lot of leadership changes happening in the world of Aviation and of course Air India included. Postponement of Def Expo 2022 cannot stop the happenings surrounding the Defense & military. The story this time is focussed on Aviation safety provided by Gurmukh Singh Bawa,..... Just one story? No. We brought you another one by Neha Singh, Associate Partner of Link Legal who believes that the advent of Drones led to another revolution in the Aviation. Even though updates on the air cargo are on a positive side, loss of one of a kind An-225 Mriya saddens me. Have I forgot to mention something? Very true, the conversation that we brought for you which surround the engines this time. One with Amit Pathak,.... Pratt & Whittney who gives us an insight into their preparedness to stay in competence with the future challenges by developing eco friendly solutions. The other interview with elaborates on the need for the emergence of engine MRO.

Make sure to meet us at the Wings as we always love to meet and have good conversations with the people. While I eagerly wait for the event, I would like to take a moment to say war brings nothing and destruction and chaos for either side. My thoughts are with the victims of the tragic circumstances. Hoping for peaceful resolutions, let me say a goodbye till you hear from me in the next issue.

Thanks

B. Kartikeya
Editor

■ SPICEJET REPORTS A NET PROFIT OF INR 23.28 CRORE IN Q3 FY 2022



SpiceJet reported a Net Profit of INR 23.28 Crore (despite one-time exceptional adjustment of INR 77.46 Crore on account of settlement) for the quarter ending December 31, 2021.

The airline recorded a 74% rise in the third quarter revenue to INR 2,679 Cr as against INR 1,539 Cr in the previous quarter as it added more destinations and newer aircraft to its fleet. For previous quarter, operating expenses were INR 2,100 Cr as against INR 2,579 Cr for the current quarter. On an EBITDA basis, SpiceJet reported a profit of INR 511 Cr as against a loss of INR 106 Cr for the last quarter. On an EBITDAR basis, the Company reported a profit of INR 644 Cr as against a profit of INR 66 Cr for the last quarter.

SpiceXpress, the Company's logistics platform, continued on its growth trajectory reporting increased revenue of INR 584 Cr for the reported quarter as compared to INR 498 Cr in the last quarter, a jump of 17%. The Company plans to significantly increase freighter capacity in the coming quarters.

Ajay Singh, Chairman and Managing Director, SpiceJet, said, "I am happy that SpiceJet reported a profit in Q3 FY2022 driven by excellent logistics operations, rebound in passenger traffic and various accommodations from aircraft manufacturer and lessors."

"The passenger industry witnessed the much needed turnaround in third quarter as Covid cases ebbed in the first half of the quarter, travel picked up significantly and there was finally hope that the worst was behind us. However, that changed by the second half of December as Omicron halted that recovery. Our performance would have

been much better but was impacted by the unexpected delay in the return to service of the 737 MAX, rising fuel costs and certain exceptional adjustments. I am happy to say that there are renewed signs of recovery in the passenger segment and the logistics segment continues to remain strong. "

■ SEVEN AAI AIRPORTS CHOSEN FOR VOICE OF CUSTOMER RECOGNITION 2021 BY ACI



Seven AAI airports namely Chennai, Kolkata, Goa, Pune, Patna, Bhubaneswar & Chandigarh that participated in ACI-ASQ survey in 2021 have been chosen for Voice of Customer Recognition under ACI World's Voice of the Customer initiative.

Airports Council International has initiated the 'Voice of the Customer' initiative to acknowledge and recognize airports that continued to prioritize their customers and are committed to ensuring their voice was heard, even during the ongoing COVID-19 pandemic.

Airport Service Quality (ASQ) survey is the world-renowned and internationally established global benchmarking programme measuring passengers' satisfaction, whilst they travel through an airport, conducted by the Airports Council International (ACI). ASQ Awards recognize those airports around the world that deliver the best customer experience in the opinion of their own passengers.

The ASQ programme provides the research tool and management information to better understand passengers' views and what they want from an airport from the products and services standpoint.

■ E195-E2 READIES FOR PORTER AIRLINES DELIVERY WITH COLD SOAK TEST



What happens to an airplane when it sits for 10 hours at -35C or less? That's what a cold soak test determines. We just completed that test for the E195-E2 recently in Yellowknife and Iqaluit, Canada. The environment was ideal for measuring the effect of prolonged cold on the aircraft's operations and systems. The test measures the impact on more than 200 items. After the "soak," Embraer's flight team flew the aircraft to check its flying behavior. There was another round of checks by the ground crew after the E195-E2 landed.

The E195-E2 already passed the cold soak test during its original certification years ago with EASA and other regulators. That test was conducted inside a hangar which simulated ultra-low outdoor temperature conditions. Transport Canada, however, requires the E195-E2 to be tested in a natural environment, and not in a lab resembling a huge refrigerator, before the first aircraft can be delivered to Porter Airlines later this year.

The E2s are no strangers to cold weather. Embraer established Pioneer Airlines in 2017 to accelerate certification of the new E-Jet family. The in-house airline used several E2s that flew in simulated airline operations, including high frequency, high-cycle schedules, and cold weather flying in North America. The results helped advance the maturity of the aircraft to ensure high reliability at service entry.

MR. ILKER AYCI APPOINTED AS THE CEO & MD OF AIR INDIA



Tata Sons announced that Mr. Ilker Ayci has been appointed the CEO & MD of Air India. The Air India board met this afternoon to consider the candidature of Mr. Ilker Ayci. Mr. N Chandrasekaran, Chairman of Tata Sons, was a special invitee to this board meeting. The board after due deliberations approved the appointment of Mr. Ilker Ayci as the CEO & MD of Air India.

This appointment is subject to requisite regulatory approvals. Until very recently, Mr. Ilker Ayci, was the Chairman of the Turkish Airlines and he was on the board of the company prior to that. Mr. N Chandrasekaran, said, "Ilker is an aviation industry leader who led Turkish Airlines to its current success during his tenure there. We are delighted to welcome Ilker to the Tata Group where he would lead Air India into the new era."

Mr. Ilker Ayci was born in Istanbul in 1971. He is 1994 alumni of Bilkent University's Department of Political Science and Public Administration. After a research stay on political science at the Leeds University in the UK in 1995, he completed an

International Relations Master's program at the Marmara University in Istanbul in 1997.

On this occasion, Mr. Ilker Ayci, said, "I am delighted and honored to accept the privilege of leading an iconic airline and to join the Tata Group. Working closely with my colleagues at Air India and the leadership of the Tata Group, we will utilize the strong heritage of Air India to make it one of the best airlines in the world with a uniquely superior flying experience that reflects Indian warmth and hospitality."

Mr. Ilker Ayci will assume his responsibilities on or before 1st April 2022.

SPICEJET ADDS KHAJURAHO TO ITS DOMESTIC NETWORK



SpiceJet announced the addition of Khajuraho – a UNESCO World Heritage Site – to its network as its 15th UDAN destination. The airline will be launching 24 new flights and will be connecting Delhi with Sharjah for the first time on its network. The new domestic and international non-stop flights will commence operations from 18th February, 2022 in a phased manner.

Hon'ble Union Minister of Civil Aviation, Shri. Jyotiraditya M. Scindia flagged-off SpiceJet's inaugural flight from Khajuraho to Delhi in the presence of Hon'ble Member of Parliament, Khajuraho, Sh. Vishnu Datt Sharma, Hon'ble Joint Secretary, Ministry of Civil Aviation, Smt. Usha Padhee and CMD, SpiceJet, Ajay Singh.

The airline will operate flights between Delhi and Khajuraho twice-a-week on Fridays and Sundays. Known for its magnificent temples, Khajuraho attracts tourists not just from other parts of the

country but from around the world. The temples in the ancient city are famous for its intricate sculptures and architectural symbolism.

SpiceJet already operates to Gwalior and Jabalpur in Madhya Pradesh. The airline connects Jabalpur with Bengaluru, Delhi, Mumbai and Pune whereas the city of Gwalior is connected to Ahmedabad, Bengaluru, Hyderabad, Jammu, Kolkata and Mumbai. The addition of Khajuraho to SpiceJet's network will play a major role in enhancing economic activity while providing a boost to the tourism in the region.

The UDAN fare on Delhi-Khajuraho-Delhi sector will start at INR 3,209 plus taxes.

Ajay Singh, Chairman and Managing Director, SpiceJet said, "We are delighted to add Khajuraho to our network as we launch 24 new flights beginning February 18, 2022. Khajuraho, a UNESCO world heritage site which will be our 15th UDAN destination, attracts tourists from all over the world for its rich history of art and culture. SpiceJet will be the only airline connecting Khajuraho with Delhi with a non-stop flight and we are proud to provide the much-needed fillip to boost travel and tourism of this historic city and State."

The airline will be connecting Delhi with Sharjah with a non-stop flight, which will operate four-times-a-week.

VISTARA ENHANCES CUSTOMER EXPERIENCE; PLANS TO RESTORE PRE-COVID LEVELS



Vistara has been gradually resuming services that were halted temporarily

due to the pandemic. The airline plans to not only restore pre-COVID standards of customer experience, but to exceed it in the coming months.

On its domestic network, Vistara brought back the choice of non-vegetarian meals in Economy Class on all eligible flights, effective 01 January 2022. The airline has also resumed serving tea and coffee, including Starbucks, on select routes and will progressively restart this service on all flights with flying time of 90 minutes and above. Vistara also re-introduced menu cards in Business Class, starting yesterday and will increase the choice of meals for its Premium Economy and Business Class customers soon.

On international routes, Vistara has already resumed the service of hot beverages including a range of teas and freshly brewed Starbucks coffee. Effective 1 February 2022, Vistara has enhanced the choice of alcoholic beverages in all three cabin classes. On short to medium haul routes, menu cards are back in the Business Class and the airline has already made the full bar available to all customers. Vistara will be resuming these on the long-haul routes along with increasing the meal options for customers. The airline will also be improving its inflight entertainment (IFE) offerings across its domestic as well as international network by introducing a wider variety of engaging content which will be updated frequently.

Commenting on the same, Mr. Deepak Rajawat, Chief Commercial Officer, Vistara, said, "Safety of our customers and staff has been our topmost priority, and takes precedence over all other considerations. As the world inches closer to normalcy now, we are delighted to bring back some of the services that were discontinued in view of customer safety. Vistara is committed to providing a world-class flying experience, backed by the continued support of our parent companies, Tata group and Singapore Airlines. While we are restoring our services progressively and systematically, we will also be introducing new enhancements at various customer touchpoints."

Since the start of the pandemic, Vistara had taken several measures including altering

several processes, truncating many inflight services, intensifying sanitization efforts etc. to maintain the highest safety and hygiene standards. The airline also, through consistent efforts, managed to get almost 100% of its staff fully vaccinated against COVID-19.

■ CHANDIGARH INTERNATIONAL AIRPORT LIMITED PRESENTED INTERIM DIVIDEND OF RS 6.67 CRORE TO AAI



Chandigarh International Airport Limited presented Interim dividend amounting to Rs. 6.67 Crore (Net of Taxes) for the Financial year 2021-22 to Airports Authority of India (AAI) on 17th February 2022.

Shri M.N.N Rao ED (Engg) & Nominee Director of CHIAL, Shri. D.K. Kamra, RED (NR), AAI & Nominee Director, CHIAL & CEO Shri Rakesh Dembla handed over the cheque to Shri Sanjeev Kumar, Chairman, AAI in the presence of Shri A K Pathak, Member (Planning) & Shri M Suresh, Member (ANS)

Chandigarh International Airport Limited (CHIAL), a Joint Venture Company was formed by AAI (51% stake), the Government of Haryana (24.5% stake) & the Government of Punjab (24.5% stake).

■ THE ZEROE DEMONSTRATOR HAS ARRIVED



The ZEROe demonstrator is a giant leap forward in our mission to bring zero-emission aviation to reality. Discover how the hydrogen combustion technology will work on the A380 test platform.

In 2015, one of the most powerful engines ever developed for an Airbus aircraft was approaching the final stages of development. But before it could be fitted to the A350-1000 aircraft for which it was destined, the engine needed to be flight and ground tested – a common practice for new technologies before entry-into-service.

That is why, on a pleasant autumn day, the aircraft equipped with the development engine took off from Airbus' facilities in Toulouse. The test flight lasted 4 hours and 14 minutes, and analysed the performance of a wide range of power settings at altitudes of up to 35,000 feet.

But it was not the A350-1000 used for the test flight: it was the A380 MSN1 – the first-ever A380 to roll off the production line. The A380 is the world's largest and most spacious passenger jet ever built – a size that makes it ideally suited to the role of test platform.

Today, the A380 MSN1 test aircraft is earmarked for a new role: to take the lead on testing the technologies that will be vital to bringing the world's first zero-emission aircraft to market by 2035.

"The A380 MSN1 is an excellent flight laboratory platform for new hydrogen technologies," says Mathias Andriamisaina, Airbus ZEROe Demonstrator Leader. "It's a safe and reliable platform that is highly versatile to test a wide range of zero-emission technologies. In addition, the platform can comfortably accommodate the large flight test instrumentation that will be needed to analyse the performance of the hydrogen in the hydrogen-propulsion system."



Aerodyne Research Corp

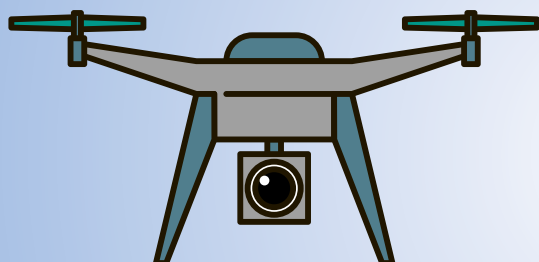
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Soeren Stark to become new Chairman of Executive Board of Lufthansa Technik



The Chairman of the Executive Board of Lufthansa Technik, Dr. Johannes Bussmann, will leave the Lufthansa Group at his own request later this year. After more than seven years in his current role and ten-years on the Executive Board, he will hand over leadership of the company to COO Soeren Stark.

Stark has been a member of the Executive Board of Lufthansa Technik since 2019. He previously held a number of other executive functions at Lufthansa Cargo and Lufthansa Technik. Subject to the approval of the Supervisory Board, he will assume his new role on July 1, 2022.

Bussmann assumed leadership in 2015 after overseeing human resources on the Executive Board for three years. After leaving Lufthansa Technik, he will become CEO of a major German technology company.

CFM International appoints Karl Sheldon as Executive Vice President

CFM International has appointed Karl Sheldon as Executive Vice President, replacing Allen Paxson.

Paxson, who had served in the role since May 2014, was recently appointed Vice President, Commercial Programmes Strategy for GE Aviation. In this newly created role, he will be responsible for development and integration of strategies for the company's commercial markets, execution on advanced engine technology programmes, including the CFM RISE programme and sustainability efforts.

Sheldon is also general manager of the CFM project department for GE Aviation. As part of the CFM Executive Team, he is responsible for overseeing programmes carried out by CFM. Along with his counterpart at Safran Aircraft Engines, Sébastien Imbourg, Sheldon also serves as the primary interface between the two companies.



**THE POWER
OF FLIGHT**

General Atomics Announces Gregg Burgess Joins Company as Vice President of Space Systems



General Atomics Electromagnetic Systems (GA-EMS) announced on February 15 that Mr. Gregg Burgess has joined the organization as vice president, GA-EMS Space Systems. Mr. Burgess will be responsible for GA-EMS' expanding portfolio of miniature, small and medium satellite solutions and space technologies for Radiofrequency and Optical communications using advanced laser technology.

"We are excited to have Gregg on-board as we continue to support customers including NASA, NOAA and Space Force, and as we bring our space systems and satellite business to the next level," stated Scott Forney, President of GA-EMS. "Gregg's depth of experience in managing for growth, in successfully designing and delivering numerous satellite programs, and driving space technology innovations, will be instrumental in expanding our capabilities and capacity to deliver critical mission solutions well into the future."

Mr. Burgess said "GA-EMS offers an extraordinary range of picosatellite, directed energy, nuclear and optical communications technologies that no other company can provide. I look forward to working with this team of highly talented engineers, scientists, and program professionals to integrate these multi-domain technologies into new, state-of-the-art satellites, payloads and systems supporting a variety of national security, government and commercial initiatives in space."

Mr. Burgess joined GA-EMS after serving as chief technology officer at Sierra Nevada Corporation (SNC) Space Systems, and as vice president of Business Development at SNC's ISR Aviation and Security Sector. Previously, he led the National Security Space division at the former Orbital Sciences Corporation, developing satellite systems for the US Government, including GSSAP, ANGELS, EAGLE, MiTE_x, and the CHIRP hosted payload. Mr. Burgess holds an MS and BS in Aeronautical and Astronautical Engineering from Massachusetts Institute of Technology and completed the General Manager's Program at Harvard Business School. He is an associate fellow of the American Institute of Aeronautics and Astronautics (AIAA).

JetBlue appoints Jonathan Weiner VP Sales and Revenue Management



JetBlue has appointed Jonathan Weiner as the carrier's new Vice President, Sales and Revenue Management. He will be responsible for revenue optimisation, ancillary strategy, distribution and corporate sales. Weiner had previously served as JetBlue's director, revenue management since 2020. He will report to Dave Clark, JetBlue's head of revenue and planning.

Weiner joined JetBlue in 2019 as Director, Revenue Analysis and Ancillary Strategy. Prior to joining JetBlue, he served as Vice President, Revenue Management – North America for British Airways. He spent 18 years in a variety of commercial leadership roles at BA including Vice President, commercial Strategy and Planning for North America and Managing Director, Revenue Management, for the carrier's transatlantic joint business.

Lockheed Martin Names Jay Malave As Chief Financial Officer



Lockheed Martin announced on February 1 that Jesus “Jay” Malave will be the company’s next chief financial officer, effective immediately. Malave most recently held the positions of senior vice president and CFO for L3Harris. Prior to that, he served as vice president and CFO of Carrier Corporation, an operating unit of United Technologies Corporation (UTC). During his more than 20 years at UTC, Jay also served as vice president and CFO of UTC Aerospace Systems and head of Investor Relations.

“As we work to advance the capabilities that will serve our customers throughout the 21st century, Jay’s leadership will be instrumental to our continued growth and performance,” said Lockheed Martin Chairman, President and CEO James Taiclet. “He brings a wealth of insight and expertise about our industry and customers as we chart the course ahead for success.”

“Lockheed Martin’s strong balance sheet and enviable position as the aerospace and defense leader provides tremendous opportunities ahead to the benefit of our customers, shareholders, employees, and taxpayers,” said Malave. “It is a privilege to lead such a highly regarded finance organization and advance the company’s vision to deter the threats of the future and connect domains for a more secure world.”

John Mollard, who served as acting CFO on an interim basis, will continue as Vice President and Treasurer.

Raytheon Technologies announces appointment of Christopher T. Calio as the company’s Chief Operating Officer and names Shane G. Eddy as President of Pratt & Whitney



Raytheon Technologies Corporation on February 14 announced the appointment of Christopher T. Calio as Chief Operating Officer and named Shane G. Eddy to succeed Calio as President of its Pratt & Whitney business unit, effective March 1, 2022.

As Chief Operating Officer, Calio will oversee the company’s four business units as well as its technology and engineering; enterprise services and digital; and operations, quality, environmental, health and safety and supply chain functions. Calio will continue to report directly to Chairman and CEO Greg Hayes.

“Chris is a tested leader who has successfully steered Pratt & Whitney through one of the most dynamic and challenging periods in aerospace history,” said Raytheon Technologies Chairman and CEO Greg Hayes. “He has guided strategic investments and delivered industry-leading innovation across commercial and military programs. As we execute on our strategy, including our commitment to develop talent across the organization, Chris’ experience and leadership will help advance the company’s growth and transformation initiatives.”

With over 20 years of executive leadership experience, Calio has spent the past decade in aerospace and defense. In his most recent position as President of Pratt & Whitney, he oversaw the significant ramp and introduction of numerous product enhancements, including the recent introduction of the GTF Advantage™ engine as well as the F135 program.

Shane Eddy, currently SVP and Chief Operations Officer at Pratt & Whitney, replaces Calio as President of Pratt & Whitney.

“Shane’s significant aerospace industry leadership experience and in-depth understanding of Pratt & Whitney’s products and culture makes him the ideal leader to take the business through its next phase of growth,” said Hayes. “Building on his proficiency running global operations, Shane’s management and operational expertise will help drive continued optimization of the business.”

Eddy joined Pratt & Whitney in 2016, with prior experience at GE Aviation, Sikorsky Aircraft Corporation and Bell Textron.

Aviation Safety

Aviate, Navigate, Communicate ... fly the airplane.



The United Nations adopted the Sustainable Development Goals (SDGs) in 2015 as a call for action for all countries to end poverty, promote prosperity, protect the planet and ensure that by 2030 all people can live safely and have access to clean water and education. Aviation is a crucial driver of economic and social growth and plays an essential role in supporting the UN SDGs through generating connectivity between nations.

The aviation sector develops millions of jobs, enables tourism and supports sustainable progress worldwide. To ensure that air traffic development is managed safely, efficiently, and securely, **ICAO has established five Strategic Objectives (SOs): Safety, Air Navigation Capacity and Efficiency, Security and Facilitation, Economic Development of Air Transport and Environmental Protection.** With an association of 15 of the 17 SDGs, ICAO too has highlighted the role of civil aviation in improving people's lives worldwide immensely. I am not going to dwell on those 17 SDGs; this is just to establish the importance of Safety and Air Navigation in the present context.

Further, in Aviation, Safety is our mission,

and it guides all of our decisions. To further flag this FAST (Foundation for Aviation and Sustainable Tourism), recently, held a webinar wherein MoS, Civil Aviation, General (Dr.) V.K.Singh was the Chief Guest and his presence clearly establishes the concerns of aviation safety at the apex level. To reach to niche audience I am penning down some of the salient features for the common benefits of all and above all for a better sustainable civil aviation in the country and more so when the future density of aircraft in the sky is going to be up and up due to numerous growth factors and the flagship program of Honourable Prime Minister, Modi ji, UDAN (Udey Desh Ka Aam Admi) the program for connecting Tier-II and Tier-III cities of India these factors shall be kept in view.

At the outset, let me mention that Aviation Safety shall be looked upon from the perspective of a key enabler of aviation as aviation is often termed as most safe mode of transport and free of errors and it demands fool proof systems and sub-systems. Thereby, leaving no room for errors and chance operations. Yes, it is not so simple; beauty is that it is true in spite of all the complexities and intricacies. Aviation is

a global activity and as such through ICAO conventions Aviation Safety is mandated at global level through various conventions and Annexures. India being a signatory to ICAO Convention has a role to play to ensure safe operations both in the sky and on the ground. Harmonization between Men and Machinery is very important and we shall make an attempt to explore the same through this piece of writing.

When we talk of harmonization, its harmonization of Air Space between Civil and Defence, between Upper and Lower Air Space and between Ground and Air. All this is essential for not only the optimization of resources rather is also essential for Safe Operations. All involved are well aware about the no-tolerance of any kind of mismatch and the resultant consequences. The two poles of communication in this regard are the ATC-on-the-ground and Pilot-in-the-Air; and all others are facilitators for the seamless and safe operations through the airport. Broadly this makes it a tenable program with key enablers being Airports, Airlines and Equipment Manufacturers. Yes, the quantum of operations matter a lot and adds to the complexities of the safe operations and as per all forecasts,

immediately after the pandemic sky is going to be full of aircraft once again. This is a positive sign of sustainable aviation in the country.

Automation in the Cockpit and On the Ground, technology for landing and take-off during Poor or No Visibility are elements of precision approach in flying and are required to be kept in most fit conditions all the times. There is a very thin line between happened and would-have-happened. Thus, over sensitization of situations in aviation is to be curbed; and, perhaps this could be done through better education and confidence building among all the stakeholders of aviation, including the media. We are aware how media sensitization over trivial or say routine things in aviation cause major disruptions and affect the bottom line of the operators.

As mentioned earlier, the traffic outlook in the post pandemic era is bright and is encouraging for the operators. Further the plans of the government in terms of Regional-Connectivity are going to be in full swing and while the international borders might take some time to get back to normal; all this will put pressure on the

domestic skies. Questions are being asked; are we having sufficient space in the sky? Do we need to re-consider aircraft spacing in the air? Are we over conservative in terms of space per aircraft? Answers could not be simple, but needs to be looked into in terms of training and confidence building so far as safe operations, better turn-around time etc. Are concerned and stringent standards are required to be more stringent!

One of the solutions to the gradual congestion in the sky is adoption of the Central Air Traffic Flow Management Systems; and India is the proud 7th Nation in the world who has gone for this. Such solutions are not only for confidence building exercises rather are tools for better harmonization of systems to drive synergy so far as better aircraft handling capacities are concerned.

Myself is from Aviation Fraternity and have had an opportunity to deal with airport operational as well as Communication with stakeholders together. Communication is very important for all action-oriented activities and aviation is no exception. As such communication between Pilot and Air Traffic Controller is very critical when

the machines are working at high speed and any error in communication can cause damages behind comprehension. There are instances when this has happened in the past and the necessary corrective actions have been taken. Thereby learning from the mishaps is yet another significant challenge. There are numerous surveys and reports indicating the communication gap as the root cause of the mishaps. Thus, communication and interaction between Pilots, ATCs and Others need to be efficient and effective.

There are already enough stringent rules and regulations, training packages and drills to mitigate the communication gap between the Pilots and ATCs. Governments have done their bit by making the safety installations as mandatory. Automation in various clearances is one such direction in which better aviation safety is further being envisaged. TCAS (Traffic Collision Avoidance System) is yet another tool in the direction of reduction of incidences of mid-air-collision between aircraft. Picking threads from here, a similar collision avoidance system, namely "Kavach" has been introduced in Indian Railways too. In



Textron Aviation delivers 8,000th Citation jet

Textron Aviation announced it has delivered a Cessna Citation Longitude to Scotts Miracle-Gro. This jet represents the 8,000th Cessna Citation jet delivered worldwide, reinforcing the Citation family as the most popular line of business jets in the world. Scotts Miracle-Gro is one of the world's largest marketers of branded consumer products for lawn and garden care and a long-time Citation owner. This is the fifth Cessna Citation in the company's fleet.

Textron Aviation employees and representatives from Scotts Miracle-Gro celebrated this significant milestone with a special delivery ceremony at Textron Aviation headquarters in Wichita. "A milestone like this wouldn't be possible without all the owners and operators who love to fly our aircraft and trust the reliability and versatility of our Citation products. With more than 41 million flight hours across the globe, our customers continue to make Citation jets their aircraft



of choice," said Textron Aviation President and CEO Ron Draper. "I also want to thank our extraordinary workforce. Each and every one of you played a part in reaching the 8,000th Citation delivery."

Cessna Citations are renowned for their ability to combine reliability, efficiency and comfort with advanced technology and class-leading performance, and no other family of business jets offers such a seamless progression of aircraft with extraordinary capabilities.

"The Citation is one of the most functional and reliable brands in the general aviation industry and I, along with the members of our flight department, congratulate Textron Aviation on the delivery of its 8,000 Citation aircraft," said Jim Hagedorn, chief executive officer of Scotts Miracle-Gro, a personal owner of the Citation CJ4, and former U.S. Air Force F-16 pilot. "Reaching this milestone is a credit to the Cessna brand, which represents quality, design and attention to the entire flying experience — all things we were looking for as we add to our fleet of business jets."

Gulfstream Begins Offering Service in Arizona to Meet Growing Customer Demand

Gulfstream Aerospace Corp. announced it has opened an aircraft service center at the Phoenix-Mesa Gateway Airport to meet growing customer demand. The new facility, which is located just across the airport from where construction is set to begin on Gulfstream's new 225,000-square-foot sustainable service center, features a large hangar that can hold multiple Gulfstream large-cabin aircraft; customer office space; a tool room; and space for parts inventory.

"We received a tremendous amount of interest from our customers when we announced our new Mesa service center this past November," said Derek Zimmerman, president, Gulfstream Customer Support.

"Anticipating that interest, we were already working with Phoenix-Mesa Gateway Airport officials to begin providing maintenance repair and overhaul options as soon as possible. Gulfstream's Mesa Service Center is the latest strategic investment we have made to expand and modernize our facilities in support of the growing Gulfstream fleet around the world. Our goal is to provide our customers with the best service when and where they need it."

The facility, located at 6253 South Sossaman Road in Mesa, will offer a variety of routine inspections and maintenance for all Gulfstream in-service aircraft. Gulfstream's Mesa service facility also will offer aircraft-on-ground (AOG)/drop-in support to address any immediate needs customers may have.



The HondaJet is the Most Delivered Aircraft in its Class for the Fifth Consecutive Year

Honda Aircraft Company announced that in 2021, the HondaJet was the most delivered aircraft in its class for the fifth consecutive year, based on data provided by the General Aviation Manufacturers Association (GAMA). During 2021, Honda Aircraft Company delivered 37 aircraft to customers globally.

"I am humbled and honored that the HondaJet continues to be selected by our owners and operators as we expand our global fleet," said Honda Aircraft Company President and CEO Michimasa Fujino. "Being the best-selling aircraft in our class for five consecutive years is a reflection of the Honda Aircraft team's commitment to offering our customers a product of the highest performance, quality, and our maturity as a leader in the aviation industry. We will continue to bring new value to the industry and provide superior service and support to customers."

Honda Aircraft Company celebrated several milestones recently, including delivery of



the 200th HondaJet in late December. The worldwide HondaJet fleet also surpassed 100,000 flight hours in January.

Additionally, the FAA recently awarded Honda Aircraft Company with the "Diamond level AMT employer award," the highest level in the William (Bill) O'Brien Aviation Maintenance Technician Awards program, in recognition of the skill and professionalism of Honda Aircraft's maintenance technicians. Since the beginning of HondaJet deliveries to customers in December 2015, Honda Aircraft Company has led the aviation industry with innovation and technology, while bringing the same high standard of service and support to every customer. The HondaJet also continues to demonstrate its

industry-leading dispatch reliability.

During 2021, Honda Aircraft Company continued development with two major announcements: the HondaJet Elite S, honored with a "Top Flight Award" as best new business jet from Aviation International News, and the HondaJet 2600 Concept, Honda Aircraft's proposal for the next generation of business jet. Meanwhile, the global presence of the HondaJet further increased when it received Thailand type certification, marking 14 countries with HondaJet certification. Honda Aircraft Company's sales and service footprint now spans North America, Europe, Latin America, Southeast Asia, China, the Middle East, India, Japan and Russia.

Gogo 5G Aircraft Antenna Receives STC and PMA

Gogo Business Aviation has received Supplemental Type Certification (STC) and Parts Manufacturer Approval (PMA) from the FAA for its 5G aircraft antenna.

"Receiving STC and PMA for the 5G antenna marks the next important milestone in the development of Gogo 5G," said Sergio Aguirre, president of Gogo Business Aviation. "Our team has been hard at work to bring Gogo 5G to life and we remain on track and on budget to launch service in the second half of 2022."

The STC for the multiband belly-mounted 5G antenna was completed by Duncan

Aviation on its company-owned Citation 560XLS. In November, Gogo also announced that Duncan Aviation is working to complete the first-article STC for the onboard 5G system.

Gogo's authorized dealers and OEM partners are actively pursuing multiple STCs that will certify the Gogo 5G system for installation on more than 30 business aircraft models.

Gogo 5G is expected to deliver ~25 Mbps on average with peak speeds in the 75-80 Mbps range and has been designed to deliver high throughput with very low latency to address the increasing demand for data-heavy interactive services like video conferencing.



Cessna Turbo Skylane Returns to Textron Aviation's Renowned Piston Product Lineup

Textron Aviation announced the return of the Cessna Turbo Skylane T182T to its legendary piston product lineup, updated with the latest avionics suite and interiors. The Turbo Skylane's turbocharged engine delivers exceptional power, generating optimal climb rates and faster cruise speeds, as well as enhanced utility for operations from high-altitude airfields. Textron Aviation is taking orders for the Turbo Skylane with first deliveries to begin in early 2023.

"The turbocharger adds another level of performance to an already exceptional aircraft," said Ron Draper, president & CEO, Textron Aviation. "The Cessna Skylane is a remarkably instinctive aircraft to operate, and the turbocharged engine provides even greater performance that enhances the overall flying experience. The Turbo Skylane represents our commitment to offering new and innovative solutions to our piston owners and operators, and we're pleased to bring expanded capabilities to this segment of the market. And with all of the latest



attributes, the Turbo Skylane truly is better than ever."

The single-engine Turbo Skylane features the latest Garmin G1000 NXi avionics suite, a heated propeller, and an in-cabin oxygen system. It is powered by the Lycoming TIO-540 engine and is equipped with a Hartzell Engine Technologies (HET) turbocharger, providing the aircraft with 235 horsepower at up to 20,000 feet. The additional power is especially beneficial for pilots flying over mountainous regions or for cruising at higher altitudes.

Originally introduced in 2001, production of the Turbo Skylane T182T was paused in 2013 while the company focused on the addition of a wide range of product developments. The Cessna Skylane, with its

normally aspirated Lycoming engine, has been in production since 1956 with more than 23,000 delivered.

"The Skylane has been a great airplane for more than six decades, and especially popular with first-time owners," said Lannie O'Bannon, senior vice president, Sales & Flight Operations. "Through our conversations with customers, many shared a desire for additional power for their unique missions. The Turbo Skylane is a perfect solution. The turbocharger is easy to operate, and the combination of a proven Lycoming engine, a heated McCauley propeller and an in-cabin oxygen system, will make this aircraft a leader in the high-performance, single-engine segment."

Dassault Aviation Announces New Northeast U.S. Falcon Service Location as Part of Long-Term Expansion Plans

Dassault Aviation has announced the opening of a new company-owned service center at New York's Long Island MacArthur Airport in Islip. The facility will initially accommodate up to five or six aircraft and provide scheduled maintenance, AOG support and pre-purchase evaluations. The service center will be less than one hour's flight time to 20% of the U.S.-based Falcon fleet and will have quick access to technical staff and parts supply at Dassault Falcon Jet's Teterboro headquarters.

Dassault has also been adding service capacity in other locations in the U.S., including Little Rock, Arkansas; St. Louis, Missouri; Stuart, Florida; and Reno, Nevada.

New enhancements in Reno include an additional maintenance bay as well, improved customer amenities, more efficient work areas and new staff additions. Heather Mirra was appointed Reno's new General Manager, bringing exceptional knowledge of the entire service network due to her previous position as Director of Network Supply Chain, Planning and Scheduling.

This regional realignment of resources is intended to offset the recent closure of one of Dassault's earliest service sites in Wilmington, Delaware. Upgrading that location for an expanding fleet and the larger 6X

and 10X aircraft was not deemed feasible. Dassault Aircraft Services has worked closely with regular Wilmington customers in recent months to help them identify good service alternatives.

«Our planning for new aircraft and new service capabilities continues,» said Jean Kayanakis, SVP Worldwide Falcon Customer Service & Service Center Network.

«Customers can expect to hear about new capacity coming online as the new models such as the Falcon 6X near their service entry dates.



With the penetration of drone technology - is aviation on the verge of another revolution?

Ms Neha Singh, Associate Partner - Link Legal



In recent years, the drone sector has witnessed growth and development globally and more particularly within the country. Whilst at first the usage was limited to government entities, but over a period of time these have come to be used in multiple sectors, such as agriculture, land mapping, surveillance, traffic regulation, defence etc.

The global market for drones which was projected to be at \$27.2b in 2020, is expected to grow to \$58.5b by 2026 at Compound Annual Growth Rate (CAGR) of 13.9% and according to a forecast by FICCI, the Indian drone market and the counter-drone market is expected to reach up to \$40 billion by 2030. Owing to technological advancements, increased awareness about drones, and the possibility of utilization of drones in businesses and the penetration it can create, the Indian drone market has also shown significant development and is predicted to grow at a CAGR of 20.9% from 2020 to 2026.

The Government of India has taken certain key initiatives in the sector to provide necessary support in terms of regulatory approvals, financing requirements and operations and the DGCA and MoCA have made substantial progress in this regard. Important developments inter alia include, the initiation of the GARUD portal which was launched in May 2022, and aims at granting government entities fast-track exemptions for deployment of drones, ease of doing business for start-ups and MSMEs to invest in drone technology by lowering the minimum annual sales threshold to INR 2cr for drones and INR 50 lac for drone components, the Digital Sky Platform, a one-of-a-kind unmanned traffic management (UTM) system that will enable the registration process and licensing of drones and operators, as well as with rapid online clearance to operators for every flight, etc.



The Digital Sky Platform/ DigiSky is indeed a step in the right direction and a much-needed tech platform to implement both operation and procedural aspects – to address both speed and precision with which the drone sector is moving. It amongst other, allows the online registration of devices, pilots, service providers, etc. The other important initiative taken up by MoCA is the Airspace Map. This was introduced on the DigiSky platform showing green, red, and yellow zones to the drone operators, where they can operate their drones.

What are drones?

Drones have the potential to serve nearly every area of the economy, including agriculture, surveillance, mining, geospatial mapping, infrastructure, defence, including during emergencies, transportation, and law enforcement, last mile transport, delivery, cargo and logistics et al. Because of their ease of use and reachability, they also have the potential to generate enormous employment opportunities and economic growth, particularly in remote and geographically inaccessible areas.

Drones are defined under section 3(i) of Drone Rules, 2021 as unmanned aircraft

systems (UAS) which can be operated without a pilot on board. The maximum weight for a drone is 500 Kgs and they are further classified into five (5) categories according to their weight:

Nano Drones	Less than or equal to 250 grams
Micro Drones	Greater than 250 grams and less than or equal to 2 kgs
Small Drone	Greater than 2 kgs and less than or equal to 25 kgs
Medium Drones	Greater than 25 kgs and less than or equal to 150 kgs
Large Drones	Greater than 150 kgs

Drone Rules 2021 - liberalized

The drone rules were first published on March 15, 2021, which was not very well received by the industry and faced a lot of criticism from industry, entrepreneurs, end-users for putting in place and promoting a license-oriented and excessively restricted drone regime. These rules were repealed and replaced by the Drone Rules, 2021 on August 25, 2022 (Drone Rules).

The Drone Rules are more business-oriented as it seems to be keeping in mind the base of entrepreneurs who are

currently leading the sector – both in terms of technological developments and production. The number of forms to be filled has been reduced to 5 from an earlier requirement of 25 forms. Instead of a drone license, the current regulations require only the Remote Pilot Certificate issued by DGCA through the DigiSky Platform. A very important and far-sighted change was also to now include drones weighing 500kg within the definition of drones. The DigiSky Platform is also being developed as a business-friendly single-window online system and self-generated permission mechanism.

The PLI scheme and the decision of the government to disallow drone imports are all steps in the direction of giving impetus to the domestic market. Drone makers will receive a 20% incentive under PLI system and more corporations and market leaders are expected to invest in drone technology as a result of this program. The Drone Rules also consist of Standard Operating Procedures for the use of drones in the farming sector etc.

The government is aiming at making India a global hub for drones by 2030 and policy initiatives such as the Drone Certification Scheme, PLI scheme, etc are all efforts

in that direction. The Drone Certification Scheme, which was announced on January 26, 2022, under Rule 7 of the Drone Rules would make type certification of drones easier, swifter, and more transparent.

Drone utilization – key examples in the government sector

- The Indian Railways has implemented the new drone-based surveillance systems. These drones are capable of video streaming, tracking time and also aids to help at the emergency sites.
- **Survey of villages and Mapping with Improved Technology in Village Areas (SVAMITVA) drones have aided in mapping of inhabited village locations.**
- **During the pandemic, drones have been deployed for vaccine distribution and have also been used to monitor Covid-19 hotspots and confinement zones to ensure that lockdown procedures are followed strictly.**
- **In the defence sector drones were being used to conduct serious operations during times of emergencies. The Defence Research and Development Organization (DRDO) has created its own drone programs. The main aim of these programs is to develop a domestic arsenal to augment and replace the existing fleet of drones.¹**

Union Budget 2022-2023

The drone sector continues to have government's attention as was showcased by the Union Budget 2022-23. A number of projects such as the Drone Shakti, was introduced in the Union budget and demonstrates the government's vision of providing support to the industry. Kisan drones, which was introduced in the budget proposition is another such initiative towards crop evaluation, digitization of land records, and spraying of fertilizers.

Drone-AS-A-Service (DRaaS) was introduced under the Drone Shakti scheme and allows service providers to communicate the benefits of technology to clients in all sectors with no capital investment and thus providing access to the entire eco system for collaboration

and growth. This is particularly important as developing tech is expensive and may become a challenge for multiple startups.

The Directorate General of Foreign Trade vide notification dated February 2, 2022, prohibited the import of foreign drones i.e., completely built up (CBU), completely knocked down (CKD), or semi-knocked down (SKD) though the prohibition does not include imports "for the sake of defence, protection, and research and development".

Sustainability

The drone infrastructure and focused development definitely is an initiative which supports global goal of reduction in carbon emissions and aligns well with India's commitment to COP26. Multiple corporations in India and globally are invested to achieve this objective.

Zipline, for instance is a medical product delivery company, which manufactures, operates, and designs drones. The zipline drones in Maharashtra delivered the covid vaccines and emergency medicines. Drones can fly in a near-direct path to their delivery location, cutting the distance traveled significantly. Not only does it make deliveries faster, but it also decreases carbon emissions significantly. Medicine from the Sky is another such initiative taken up by the government of Telangana, which uses drones to distribute medications and vaccines to remote locations.

Per the Drone Policy, the government also aims at introducing air taxis in the near future. There has been a continuous effort towards simplifying the process of obtaining a drone license and simultaneously building drone corridors to facilitate freight delivery. Chandigarh was the first city in India to operate an air taxi service.

Air taxis and the electric vertical take-off and Landing (e-VTOL) and the usage of sustainable aviation fuel, in the longer run can definitely bring down carbon footprint that the industry has. Tech Eagle teamed up with the government of Meghalaya under the Smart Village Movement to demonstrate how a hybrid e-VTOL drone can carry vital drugs. It was the first time probably that a hybrid e-VTOL drone was operated in the country.

Conclusion

The Covid outbreak has definitely served as a trigger to showcase the need and reach of drones and the government seems to have taken charge of the sector with a view to supporting it with right policy decisions to achieve multiple objectives of growth, connectivity, technology, speed, penetration and sustainability. The liberalized Drone Rules and the announcements made in the Union Budget 2022-23 are not only indicative of government's commitment but are also key steps in the direction of a sustainable growth story in the Indian aviation sector and otherwise.



Successful launch of PSLV-C52 with EOS-04 Satellite

The Polar Satellite Launch Vehicle PSLV- C52 successfully launched EOS-04 Satellite from the first launch pad of Satish Dhawan Space Centre (SDSC), SHAR, Sriharikota.

After a smooth countdown of 25 hrs 30 minutes the PSLV- C52 launch vehicle lifted off at 05:59 hrs (IST) in the opening of the launch window. The important flight events, namely, stage & strap-on ignitions, heat shield separation, stages & strap-on separation, satellite injection took place exactly as planned.

After a flight of about 17 minutes 34 seconds three satellites namely EOS-04, INSPIRESat-1 and INST-2TD were injected successfully into a sun-synchronous polar orbit of 529 km. The orbit achieved for the satellites is very close to the intended orbits.

After separation, the two solar arrays of EOS-04 deployed automatically and ISRO Telemetry Tracking and Command Network (ISTRAC) at Bangalore has assumed the control of the satellite. In the coming days the satellite will be brought to its final operational configuration following which it will begin to provide the data.



MoD signs contract worth 1075 crore with M/s BEL for the supply of 957 Commander Thermal Imager cum Day Sights for T-90 Tanks

Providing a further boost to the 'Make in India' initiative of the Government of India in the Defence Sector, the Acquisition Wing of the Ministry of Defence has signed a contract for Rs. 1075 crore with M/s Bharat Electronics Limited (BEL) for the retro-modification of Commander Sight of Battle Tanks-T-90. The retro-modification will be carried out in 957 T-90 tanks of the Indian Army.



Commander sight of Battle Tank T-90, India's premier battle tank, is presently fitted with Image Converter (IC) tube-based sight for night viewing. Based on the requirement projected by the Indian Army, DRDO and BEL have jointly designed and developed an advanced Mid Wave Thermal Image (MWIR) based sight as a replacement for the existing IC-based sight.

The new retro-modified Commander sight employs a thermal imager capable of detecting the targets at 8 Kms during day and night and a Laser Ranger Finder (LRF) to find the ranges accurately up to 5 Kms, thereby enhancing its capability to engage target at longer ranges. With the corrections from ballistic software and LRF, the Commander of T-90 can detect, engage and neutralize the targets with phenomenal accuracy. The indigenously developed sight completed extensive evaluations under field conditions successfully.

The successful indigenous development of Thermal Imager based Commander Sight will provide further fillip to indigenous R&D and defence manufacturing.

Anadrone Systems Bags Defence Contract under Make-II Category

Achieving self-reliance in the defence sector took a significant step forward on January 18, as Indian Army signed its first contract worth Rs 96 crore with Anadrone Systems Pvt Ltd under Make-II for Manoeuvrable Expendable Aerial Target.

Under the industry-funded Make in India scheme (Make-II) of the defence ministry, Anadrone Systems Pvt Ltd signed a contract to supply expendable aerial targets to the Army and Air Force. The officials acknowledged it as a critical landmark that will pave the way for more such opportunities.

"It is the first contract under Make II. Efforts are being made to drive industry-led research and development in the defence sector," said Sanjay Jaju, additional secretary-defence production, Ministry of Defence.

The Make-II category was introduced in 2016 as a major step towards engaging the industry. The contract to supply 125 of the Manoeuvrable Expendable Aerial Targets (MEAT) and associated equipment, under this category is meant for research and development projects funded by the



industry with an indigenous content of over 50%.

Though the contract value at Rs 96 crore is low when compared to other defence contracts, the competition saw the winning company pitching its product against defence giant Larsen and Toubro.

The Shikra MEAT system is a localised version of the Banshee Jet 40 system (imported by the armed forces earlier) and is being manufactured by the company. The Shikra is an aerial target designed to be used over land and sea for training of crew on air defence weapon systems. The expendable drone can be manoeuvred at subsonic speeds to simulate an incoming

target for air defence weapons.

According to an Anadrone executive (as reported in media): "The Shikra target solution was the only system able to demonstrate its ability to meet or exceed all of the required operational and performance requirements of the Indian Army and Anadrone was selected as a single source vendor". He further added that at least 50% of the product supplied would have indigenous content.

Over 600 aerial targets have been supplied till now by Anadrone Systems from its Odisha factory in partnership with QinetiQ Target Systems Ltd – a UK defence specialist firm.

Safran Electronics & Defense Services Asia invests in new MRO capabilities in Singapore

Safran Electronics & Defense Services Asia announced that it has increased its scope of MRO activities. Safran Electronics & Defense Services Asia will now carry out Maintenance and Repair Operations on landing gear control systems, such as tire pressure and brake temperature monitoring, for aircraft ranging from business jets to civilian aircraft, at its Singapore site. Safran Electronics & Defense Services Asia's territorial rights to perform these repairs covers Asia Pacific, Europe, Middle East and Africa.

In addition, Safran Electronics & Defense Services Asia received new scopes of repair including a range of products such as external lighting, wiper system, cockpit control systems and cargo door.

"In anticipation of the traffic recovery in the region, we have increased our capacity and scope of repair and we recently upgraded our store to welcome more activity.

Our company now serves as Safran's sole site for repairs in Asia Pacific for A350 avionics equipment and Rotating Pressure Sensor Assembly components," commented Matthieu Pere, CEO of Safran Electronics & Defense Services Asia.

"We welcome Safran Electronics & Defense Services Asia's

decision to expand its MRO capabilities in Singapore. It is a testimony to Safran's confidence in Singapore as a leading aerospace hub," said Lim Tse Yong, Vice President, Capital Goods and Vice President, Conglomerates, Singapore Economic Development Board. "We look forward to partnering with our industry partners, including Safran, to seize opportunities with the recovery."





Lockheed Martin Sikorsky-Boeing Selects Honeywell Engine to Power DEFiant X®

Sikorsky, a Lockheed Martin Company and Boeing announced Honeywell as the engine provider for DEFiant X, the advanced helicopter for the U.S. Army's Future Long-Range Assault Aircraft (FLRAA) competition.

With Honeywell providing the HTS7500 turboshaft engine, Team DEFiant brings unsurpassed Army Aviation experience to revolutionize Army air assault while seamlessly integrating with legacy platforms, proven tactics and existing infrastructure. DEFiant X® will be the fastest, most maneuverable and survivable

assault helicopter in history.

"Team DEFiant's strength is built on the experience of Sikorsky and Boeing, and a commitment to Army Aviation," said Mark Cherry, vice president and general manager of Boeing Vertical Lift. "Honeywell's history with Boeing and the U.S. Army makes us even more confident that DEFiant X® is the best fit for the Army's total mission."

"DEFiant X® is a transformational aircraft, and Honeywell is giving us a transformational engine to power it," said Paul Lemmo, president of Sikorsky. "DEFiant X® is optimized for operational effectiveness, sustainment and interoperability with the enduring fleet, and will transform the Army."

DEFiant X® is a complete weapon system that builds on the handling

qualities and capabilities proven by the team's technology demonstrator, SB>1 DEFiant®. It flies twice as far and fast as the venerable Black Hawk helicopter it is designed to replace. Currently undergoing testing in a digital combat environment, the aircraft continues to prove itself as the most survivable platform for mission requirements.

"Honeywell is excited to be a part of Team DEFiant and proud to play a part in the future of vertical lift for the U.S. Army," said Ricky Freeman, president, Defense & Space at Honeywell Aerospace. "We're confident our HTS7500 engine on the DEFiant X® platform will provide the Army with an agile, fast and maneuverable platform that will help ensure overmatch capability in the future battlespace."

DRDO Developed MMICs Onboard EOS 04

Defence Research and Development Organisation (DRDO) developed Monolithic Microwave Integrated Circuits (MMICs) have been used in radar imaging satellite modules of EOS 04, which was launched by ISRO on 14th Feb 2022. Many of the Monolithic Microwave Integrated Circuits (MMIC) were designed/ developed and produced at Solid State Physics Laboratory (SSPL) DRDO and Gallium Arsenide Enabling

Technology Centre (GAETEC) foundry of DRDO.

The TR-Modules used in the payload for Radar imaging have been developed using these MMICs. More than 30,000 modules have been produced at GAETEC foundry for various space missions. This is an example of collaborative achievement between two advanced technology departments of Government of India along with support of industry partners. The use of indigenously designed and developed MMICs is an important step towards Atmanibhar Bharat.



Emergence of Engine MRO



Can you explain your journey in the field of Aviation and especially in the Engine MRO. What is the need to develop and establish strong INDIAN ENGINE MRO?

My journey started with ground up in the ENGINE MRO. We were one of the first groups in INDIA for this exposure in 1980s. With Keen to learn we made quick advances in acquiring technical knowledge and there upon effectively managed large ENGINE MRO SHOP.

With new opportunities in INDIA in the year 2000 I have taken-up leadership role and transitioned from military to commercial engines. WE started building new teams and trained engineers in the high skilled areas. This formed in developing cross-functional teams and expand with new strategic partnerships that facilitated company goals. This was the magic moment for the whole team in travelling the globe and attending the high demands

of technical challenges and on top digital transformation. I was on the first to start TECHNICAL PUBLICATION teams across the enterprise and converted millions of pages from standard manuals to DIGITAL.

We facilitated young engineers training in the advance Engine MRO capabilities and started very highly sophisticated AERO ENGINE REPAIR development for PRATT AND WHITNEY, GE and other Engines.

I really enjoyed the journey travelling through this pinnacle moment and enjoyed knowledge exposure in the international MRO forums.

What is your view on the current Global Engine MRO market in the world?

Engine MRO requirement is on a rise and demand for the engine maintenance are distributed across globally. Currently, Engine MROs are primarily from the following regions which are OEM dominated:

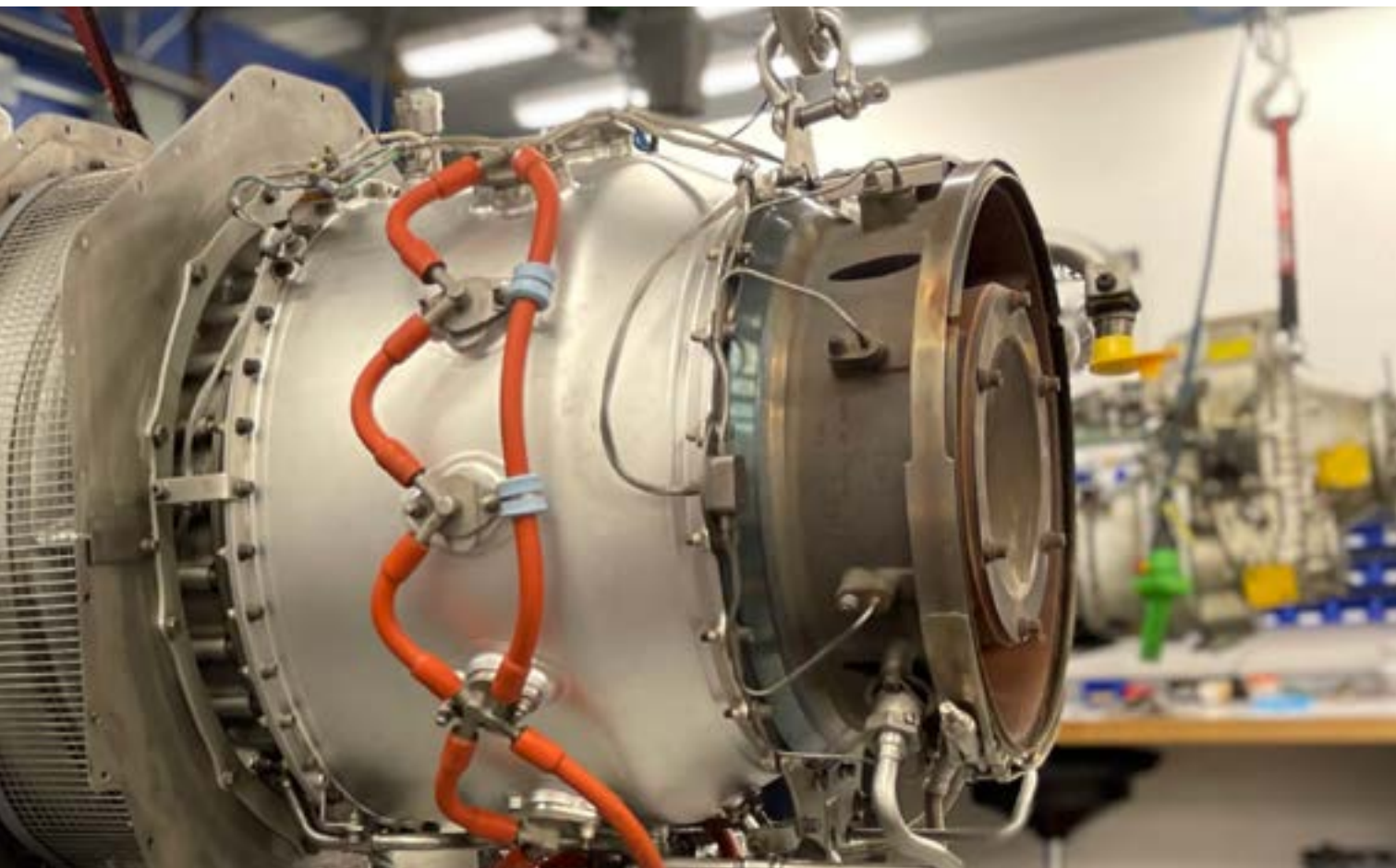
1. North America
2. Europe

These continents take the major share of business and have OEM support extensively. This entails most of the small airlines and big airlines scramble to send their engines to these entities.

The other global markets and demand are from:

1. Latin America
2. Africa and Middle East
3. Asia (China)
4. South-East Asia (India, Malaysia, Bangladesh, Singapore and Indonesia)
5. Far East Asia (Japan)
6. Australia

What are the current predictions for engine arising for wide body, narrow body and regional?



Prediction and analysis can put globally the Engine MRO size to combine wide body; narrow body and regional which has \$ 300 plus Billions in the market size for the next decade and thus averaging 20 to 25 billion every year. Asia alone has the wide body, narrow body and regional combined to almost \$100 Billion plus for the next decade.

India holds considerable number of wide body, large number of narrow body and regional body aircrafts that are owned and leased. The lessors in agreement with the operators send their engines to major Engine MRO shops across the globe. So, most of the revenue generated in the country gets dissipated into various countries which have Engine MROs.

India has very good infrastructure, manpower and opportunities for setting up the large MROs. There is huge GAP in the understanding of the latest technologies currently among aviation enterprise. The funding is almost negligible to establish new technologies, regulatory understanding in setting up new ENGINE MROs.

The only current AirIndia ENGINE MRO needs complete transition and infuse new technologies with enhanced training of manpower and addition of critical machines for repairs. We expect India to gearup for building engine MROs in the near future.

The global arising for narrow body engines per year by 2025

The engine arising for engine repairs, module exchange and core restoration which needs shop visits across the globe are as below:

1. CFM 56-5: Estimated arisings are approximately 1,500 Engines across the globe.
2. CFM 56-7: Estimated arisings are approximately 3,900 Engines across the globe.
3. V2500: Estimated arisings are approximately 1,300 Engines across the globe.

The arising for regional jets needs to be

established and the numbers can be shared across the following categories of Engines:

1. Piston Engines
2. Turboprop Engines
3. Turbo Shaft Engines
4. Turbo Fan Engines

What are the current aviation scenarios Globally?

Due to the pandemic situation global airlines had seen massive Fleet Grounding, Airline Restructuring Financially, Lease Rental Restructuring, Asset Consolidation and rigorous Financial Planning.

Airlines across the globe have initiated the process of restoring their grounded aircrafts to fly-worthy condition. This needed highly trained personnel to execute this massive task and there is a need for aviation regulatory authorities to ramp up inspections. The new aircrafts need inspections with understanding of

new technologies. This needs extensive deployment of training programs by OEMs and industry experts for MRO engineers, inspectors and administration teams for their skill development. There is an immediate need for augmenting experienced resources either by contracting or consulting from various regulatory authorities of other countries.

What are the factors you wish if changes can contribute to the growth of the MROs in India?

India has four large MROs which has control and capacities in full for the India Operated Aircrafts with minimal international fleet induction. Indian MROs need expansion in all respects to compete with international MROs to bring narrow body and wide body Aircrafts into Indian MROs. The current aviation growth in the country needs addition of atleast two major Engine MROs in cooperation and consent with OEMs. This may need aviation ministry to support the expansion programs with ease of establishment.

Are you seeing a resurgence in demand for older engines following the pandemic?

Globally, engines arising after massive grounding of airlines has surged and spiked and filled the capacities. There is a need for greater taskforce to inspect, re-certify the engines across the airlines which were preserved due to grounding.

What are your priorities for 2022-2025?

We are planning to have joint ventures with different entities in the aviation. We are also planning to set up wheels and brakes, heat exchanger, nacelle, fuel nozzle overhaul and small engine development with overhaul capabilities.

We also are looking at establishing small drone engine development programs. We also are in discussion with micro turbine engine development companies for integrating into new technologies.

Our next plan is to have comprehensive and technical support to Airlines, Business Jets and Helicopter operators. We have enhanced our capabilities in tying up with



different engine shops across the globe. This will entail all operators in predicting and financially plan for engine arising.

What are the new associations for GNAT Aviation?

1. GNAT aviation has signed the representation and management of engines with **KOPT TURBINES Inc. (d.b.a. KOPTAIR) Montreal, Canada** for PW100, PW200 and PT6 Engines, HSI and Engine Overhaul management through KOPT Air.



Ghislain Paré

Accountable Manager, Kopt Turbines Inc. Engine Overhaul Expert for PW100, PW200, PT6 and PW1100 Series Aero Engines.

2. GNAT aviation has signed the representation and management of engines with IAG Group, USA & Rome for CMF56, CF6 and PW4000 Series Engines.



Niranjan Kumar Madari

CEO, GNAT Aviation India & US. He has acquired vast knowledge in aero engine technologies and MRO. He has to his credit major publications and paper in Aviation. He has built new teams in enhancing the aviation MRO and drone engines.

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MARCH | 2022 **27**

Textron Aviation Unveils its First Production Cessna Skycourier Large Utility Turboprop

Textron Aviation announced the rollout of the first production unit of the twin-engine, large-utility turboprop, the Cessna SkyCourier, at the company's manufacturing facility in Wichita. The new, clean-sheet design has allowed for the incorporation of the latest state-of-the-art assembly and fabrication processes and techniques into the manufacturing of the aircraft.

"Today is a rewarding day for our employees who have worked to design and build what I believe will become a legendary airplane for our company," said Ron Draper, president and CEO, Textron Aviation. "The SkyCourier brings an impressive combination of cabin flexibility, payload capability, performance and low operating costs to the twin engine utility segment. We look forward to this highly versatile aircraft entering the market very soon."

From the SkyCourier's inception, launch customer FedEx Express and other members of Textron Aviation's Customer Advisory Board were instrumental in shaping the aircraft's design, from manufacturing



methods and materials, to product features and serviceability. Textron Aviation's highly skilled employees incorporated this feedback and found opportunities to maximize quality and precision, while meeting and exceeding customer expectations.

Production of the SkyCourier incorporates many of the latest advancements in aircraft manufacturing, including the use of monolithic machining throughout the airframe. With this technique, major assemblies are milled from a single piece of metal rather than assembled from smaller pieces, reducing the overall number of parts and resulting in a more precise tolerances for easier assembly.

Designed with serviceability at the forefront, the SkyCourier features quick access points throughout the aircraft for inspection and repairs. The team also developed innovative patent-pending quick release seats and overhead bins that can be installed quickly by a single operator.

The SkyCourier celebrated its inaugural flight in May 2020, and the flight test program's three aircraft have accumulated more than 2,100 hours. Following certification, which is anticipated in the first half of 2022, this first production unit will be delivered to the launch customer, FedEx Express, which has agreed to purchase up to 100 aircraft, with an initial fleet order of 50 cargo aircraft and options for 50 more.

Antonov Airlines confirms Big Bird Mriya damaged

Ukraine-based Antonov Airlines confirmed that as a result of attack and capture of Ukrainian civil Kyiv-Antonov airport (Gostomel, GML) by Russian troops, the largest aircraft in the world AN-225 Mriya was damaged and burned down. "The aircraft was at the home base in Ukraine for maintenance. The loss of this unique aircraft, which was the real piece of technical art, is a great loss not only for Antonov Company and Ukraine but for the entire aviation world..."

Earlier, Antonov, which owns and flies the unique 250-tonne payload AN-225 Mriya (meaning dream or inspiration) has said that "until the AN-225 has been inspected by experts, we cannot report on the technical condition of the aircraft."

Mriya holds multiple records including the heaviest aircraft ever built and the absolute world record for an airlifted single-item payload of 189,980 kg and an airlifted total payload of 253,820 kg. It also transported a payload of 247,000 kg on a commercial flight.

Antonov specialises in the transportation of outsized and project cargo worldwide using its fleet of seven AN-124-100 Ruslan aircraft (two with payload up to 150 tonnes)

and the 60-tonne payload AN-22. It also operates smaller AN-74 and AN-26 aircraft. Founded more than 30 years ago, Antonov Airlines is a division of Antonov Company, headquartered in Kyiv, Ukraine, and a Ukrainian state-owned enterprise, which designs, develops, produces, and maintains the AN aircraft. It is also a member of leading international project cargo specialist group The Heavy Lift Group.



Western Global Airlines Purchases Two Boeing 777 Freighters

Boeing and Western Global Airlines announced a firm order for two 777 Freighters, the first new-production freighters for the all-Boeing cargo operator based in Estero, Fla. The order was finalized in January 2022 and is currently listed as unidentified in Boeing's order backlog. The agreement also includes an additional purchase option.

"Western Global is pleased to acquire new-build 777 Freighter aircraft. As the world's fastest growing cargo airline, we have determined that augmenting our existing fleet with new 777 Freighters will enable us to best serve our customers while providing a clear path to our future fleet plans," said Jim Neff, Western Global Airlines CEO & founder.

Boeing's market-leading 777 Freighter is the world's largest, longest-range and most



capable twin-engine freighter currently flying, with the lowest trip cost and highest reliability of any large freighter. With a range of 4,970 nautical miles (9,200 kilometers), the 777 Freighter can carry a maximum structural payload of 107 metric tons (235,900 pounds), while reducing fuel use and CO2 emissions compared to prior airplanes. This capability and exceptional efficiency translate into significant savings for cargo operators, with fewer stops and associated landing fees.

Boeing has forecast that the global freighter fleet will grow by 70% in the next 20 years, with freight carriers such as Western Global

supporting a rapidly expanding global e-commerce business and evolving supply chains.

"The addition of 777 Freighters will enable Western Global to continue its growth, providing increased capability and flexibility to its operations," said Ihssane Mounir, Boeing senior vice president of Commercial Sales and Marketing. "These new freighters will complement its existing all-Boeing fleet and we are committed to deepening the partnership between our companies, which has existed since Western Global's inception."

Introducing E-Jet cargo conversions

We've just launched a new freighter program that will right-size the cargo industry with E-Jets. In response to the explosive growth in e-commerce and increased demand for cargo capacity, especially to smaller markets, we've developed a program to convert pre-owned E190s and E195s from passenger jets to freighters. First deliveries are planned for 2024.

Rather than simple quick-change procedures in which seats are removed from passenger cabins, our E-Jet freighters have structural modifications. Overhead bins are removed, there are new smoke detection and fire suppression systems, the main deck floor is reinforced and has a cargo handling system, and there is a new forward cargo door.

What really makes the E-Jet freighters attractive is their ability to offer optimized loading configurations. Cargo carriers can therefore maximize efficiency by better

matching capacity to demand. The E-Jet freighters offer greater frequency and better operating economics in smaller markets than larger aircraft.

How much can our E-Jets freighters carry? Combining under-floor bulk cargo and main

	Load Configuration	Volume (ft ³ /m ³)	Payload (lb/kg)
E190F	7 ULDs main deck + under floor	3,632 / 102.8	23,608 / 10,709
E195F	8 ULDs main deck + under floor	4,171 / 118.1	27,112 / 12,298

The range and payload capacity of the E195F is similar to the B737-300SF (nearly 2,500 nm) yet the E195F burns less fuel, generates fewer emissions, and has lower maintenance and cash operating costs.

Our E-Jet freighter conversion program is another example of an innovative solution to an emerging market opportunity. They are, in fact, bringing the concept of right-sizing to the cargo industry by tapping the gap between turboprop and larger narrow body freighters.

Cargo airlines can now put right-capacity E190F and E195F freighters on the right

deck, the maximum gross structural payload is 13,150kg for the E190F and 14,300kg for the E195F. Considering typical e-commerce cargo density and main deck configured with ULDs, the net weights and volumes are also impressive:

routes with the right frequency and right economics. Moreover, airlines can now access new smaller markets while deploying their larger aircraft on routes where they are more economical.



DHL Express Places New Order for Six Additional 777 Freighters

DHL Express and Boeing announced that the world-leading express service provider has placed an order for six additional 777 Freighters. The purchase takes DHL Express' order book total to 28 777 Freighters since it placed its first direct order in 2018 for today's largest and most capable twin-engine freighter.

"With the order of six new, large widebody freighter aircraft, we continue to invest in our future and further enhance the capability and reach of our global air network. The Boeing 777 Freighter is the most fuel-efficient aircraft in its class and will connect DHL's global hubs in Cincinnati, Leipzig and Hong Kong as well as serving other key markets," said Geoff Kehr, senior vice president, Global Air Fleet Management, DHL Express. "We are committed to providing the highest quality and efficient services to our customers while at the same time lowering our carbon emissions by modernizing our fleet with the



most efficient aircraft type available. The new aircraft will significantly contribute to our aspiration to reduce our greenhouse gas emissions to under 29 million tons by 2030."

The 777 Freighter improves fuel efficiency and reduces CO₂ emissions by 17% compared to legacy airplanes. DHL Express has taken delivery of 15 777 Freighters to date.

"DHL Express' continued confidence in the 777 Freighter is testament to the airplane's outstanding capabilities in supporting

global cargo demand," said Ihsane Mounir, Boeing's senior vice president of Commercial Sales and Marketing. "The 777 Freighter's unmatched operating efficiency is enabling DHL to meet its sustainability commitments by reducing carbon emissions and contributing to its overall goal of net zero emissions by 2050."

The 777 Freighter is Boeing's best-selling freighter of all time. Customers from around the world have ordered more than 300 777 Freighters since the program began in 2005.

ATSG commits to 29 A330P2Fs, EFW to do conversions

Air Transport Services Group (ATSG), the world's largest lessor of freighter aircraft, has committed to 29 Airbus A330 Passenger-to-Freighter (P2F) conversion slots with Elbe Flugzeugwerke (EFW), a joint venture between ST Engineering and Airbus. "The A330-300 passenger-to-freighter conversion is a natural next step for ATSG as it is an excellent complement to the Boeing 767-300 medium wide-body freighter, which has long been the freighter of choice for the e-commerce air cargo market," says Mike Berger, chief commercial officer, ATSG.

"The availability of feedstock combined with impressive cargo capacity make the

A330 a very attractive option for conversion and will enable ATSG to continue to meet the demands for full-capacity freighters long into the future. The customer response to the news that we will have A330-300 freighters available for lease has been exceptionally strong, and we already have customer deposits toward future leases for half of these 29 converted freighters."

Andreas Sperl, CEO, EFW added: "To have a key market player like ATSG adopting the A330P2F programme with such a high commitment is a major milestone for us. This is a great sign of confidence in next-generation Airbus freighters and trust in EFW's competency as a centre of excellence for Airbus freighter conversions."

The A330P2F programme comes with two variants – the

A330-200P2F and A330-300P2F – which are both equipped with advanced technology that offer airlines additional operational and economic benefits. "The A330-200P2F can carry a gross payload of up to 61 tonnes to over 7,700 km. The A330-300P2F offers a gross payload of up to 63 tonnes and a containerised volume of up to ~18,581ft³ (~526m³), which brings a new paradigm of efficiency with 23% more cargo volume than other freighter aircraft in the same class."





Propelling into the greener future through innovation

Amit Pathak GM Pratt & Whitney

Covid-19 has affected the aviation industry too globally. How did Pratt & Whitney overcome the impact caused by the pandemic? What are the major projects in the post-pandemic period?

The Covid-19 pandemic in the past two years has impacted the aviation industry in India and the world. In India we are seeing signs of recovery as the domestic passenger traffic slowly climbs towards pre-pandemic levels. Our primary focus during the pandemic was to support our airline customers and working with them closely to ensure that they were ready for a well-supported return to demand.

However, the COVID-19 pandemic has given us – and the industry – a chance to evaluate, prioritize and perhaps accelerate adoption of advanced technologies, and perhaps work towards achieving sustainable aviation in the future.

As the industry steps on the path to recovery, the need for more efficient, more sustainable air travel has become more important than ever – and this is where engines like the GTF have played a crucial role. In fact, in the past two years

dominated by the pandemic, global data indicates that on the Airbus A320neo, GTF utilization has been higher and GTF-equipped aircraft are usually the last planes taken out of service, and the first planes returned to service.

In India (and globally) the GTF has met or exceeded its fuel efficiency, emissions, and noise commitments from day one and has since achieved a strong record of dependability and low operating cost. This is the first new-architecture engine of its kind, allowing the fan and turbine to spin at their optimal speeds. The geared turbofan is the future of aviation.

In India, there are now more than 190 GTF powered aircraft that are helping drive the post-pandemic recovery for our customers like IndiGo and GoFirst. They are delivering the fuel-economics and efficiency airlines need. In the past 5 years, over 100 million passengers in India have flown on GTF powered aircraft. The engines have clocked more than 3 million engine flight hours for our Indian customers and saved 600 million liters of fuel for them.

The Aviation industry is turning towards greener aircraft for the future. Do you think the Indian

airspace is equipped for such a transition? When do you think will be the earliest the greener aircraft will be dominating our skies?

As we emerge from the Covid-19 pandemic, the aerospace industry, in India and globally, is poised to return to a rapid rate of growth. We need to ensure that this growth continues on a sustainable basis. Although aviation is currently responsible for only 2.4% of global CO2 emissions, this is forecast to rise as other sectors of the economy decarbonize.

India has taken timely steps towards CO2 reduction with hundreds of new and efficient aircraft in its inventory. With the government and industry working to develop new regional routes, India's commercial airlines will add more of such efficient aircraft to make connectivity affordable and sustainable. Recently, major Indian airlines and industry stakeholders have also committed to explore the potential of using SAFs in aircraft and to increase its supply in the market. In India, we are also constantly engaging, sharing our perspective and our expertise with diverse bodies like the Bio-ATF Program Committee, our airline customers, and the



Ministry of Civil Aviation among others.

All of this creates a great opportunity to drive policy towards accelerating SAF uptake in the short term – and pursuing a range of technology solutions, developed for different applications, in the long term.

For sustainable aviation – apart from developing SAFs and thermal propulsion technology, hydrogen-fueled and electric-powered aircraft are also offering exciting opportunities to further reduce or even eliminate aircraft CO₂ emissions. These technologies are already being developed for regional aircraft – like our recently announced hybrid-electric propulsion technology and flight demonstrator program.

The program targets a 30% improvement in fuel efficiency compared to today's most advanced turboprops, and we are working with De Havilland Aircraft of Canada Limited to integrate this hybrid-electric technology into a Dash 8-100 flight demonstrator. Technologies like these may well be introduced into regional airline services by late 2030s – and given India's thrust on UDAN and regional connectivity – there is an opportunity for India to take the lead in the future.

What are your expectations from aviation industry in 2022?

As the airlines continue to recover, we are confident that our GTF engine will be

delivering the fuel economics and efficiency they need to accelerate that recovery and future growth – and we will continue to support them. We also see regional aviation shaping up in a big way, with the government's policies and measures giving UDAN the boost it needs.

Finally, we believe that the far-sighted measures we saw in the 2022 budget when it comes to energy transition, and climate action will be crucial towards securing India's bright future. Given the focus on climate action, India should also look at measures to shape its sustainable flight roadmap – including leading the way with sustainable regional aviation growth, and incentivizing aviation stakeholders for SAF (Sustainable Aviation Fuel) adoption.

Could you elaborate more on what you're doing to support India's MRO and skill development ambitions?

India's aerospace industry is building a strong footprint and is poised to continue the positive momentum in the coming decades – and the government's progressive policies and efforts in MRO, skilling and regional aviation will positively impact this growth in the years to come.

In India, not only does Pratt & Whitey provide its most advanced and dependable propulsion technology to India; we are also invested in strengthening the

country's aerospace ecosystem. As part of our investments, we established our India Customer Training Center (CTC) in Hyderabad. Launched in 2015, the center in Hyderabad is one of three Pratt & Whitney training centers operating globally which offer specialized DGCA and EASA Part 147 approved trainings. The center provides advanced training for airline customers, MRO operators, as well as industry and university skill development programs, to spur the growth of the aviation sector in India. The India CTC has imparted 11,500 student days of training to over 39 operators representing over 27 nationalities since its launch.

Another example of our continued involvement in India's aerospace growth story is our R&D presence through the Center of Excellence (COE) located at the Indian Institute of Science (IISc), Bengaluru. The COE has been engaged in state-of-the-art research since 2012, in the areas of advanced materials, combustion, and mechanical design. The center also recently expanded its capabilities to include research in advanced gas turbine technologies. The team at center also identifies and monitors new collaborations and projects with leading universities in India, including IIT, Bombay and University of Hyderabad.

For the MRO and aviation ecosystem to grow in India, as a sector, we need to focus on building scale that encourages OEMs to invest, use civil and defense commonality to our advantage, and develop our engineering talent.

What are the business prospects for the company in the fast-growing Indian civil aviation industry?

In India, Pratt & Whitney's 1700 engines and APUs power over 900 aircraft for more than 185 operators. We are proud to say that we have the largest footprint of any engine maker in the country, and one in every two people flying in India, fly on planes powered by Pratt & Whitney engines.

At this juncture, we look forward to our revolutionary GTF engine, that's currently on more than a 190 aircraft, delivering the fuel efficiency and economics that our



customers like IndiGo and Go First need. We have also introduced the GTF Advantage engine which further extends the economic and environmental benefits of the existing GTF – by reducing fuel consumption by an additional 1% – and extends its lead as the most efficient powerplant for the A320neo family. We expect the GTF Advantage, with its incremental thrust and efficiency gains, to bring additional benefits to India in the future.

We have shaped regional aviation worldwide, and in India, we have been powering the regional market with the De Havilland Dash 8 (PW150 engines) and the ATR 72 and 42 (PW100 engines). As regional aviation under UDAN takes a strong form in India, we will continue to support the regional airline operators in powering green, clean and affordable air travel through our engine and propulsion technology.

India is an important strategic market for us, and we see tremendous opportunities in the Indian government's UDAN scheme, which aims to accelerate air travel penetration

through regional connectivity and make flying affordable.

Could you share with us your visions and priorities for the company? What is the roadmap ahead and what are the major objectives?

Pratt & Whitney is proud to have contributed to each and every phase of the country's aerospace growth. From the 'Parshuram' Douglas DC-3 aircraft that served the armed forces in 1947, and the JT9D on the 747s, to the V2500s on IndiGo's A320ceo fleet in mid 2000s that ushered in the new age of private aviation in India, and the revolutionary and fuel-efficient GTF engines that are powering India's modern commercial fleet – Pratt & Whitney has been central in supporting India's

aerospace growth story for the last seven decades.

Our commitment to India is more than just the market it represents; and we see India as a mutual partner for success. We will continue to build our India presence through partnered investments in innovation, research, supply chain and sustainment – working with leading Indian aerospace suppliers. We look forward to sharing more on how we are accelerating our presence in India soon.





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