ISSN 2230-9225

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VOL 27 ISSUE 7 • 2024

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NEW LEADERSHIP TO CHART THE COURSE

FIA2024 PREVIEW
RETURNS TO SKYROCKET ITS 75 YEARS LEGACY

LAST WORD
NDA 3.0 – DEFENCE BUDGET

+++

SETTING BENCHMARKS

QATAR EXECUTIVE (QE), THE PRIVATE AVIATION ARM OF QATAR AIRWAYS, HAS BEEN ONE OF THE GLOBAL LEADERS ON THE FRONT OF AN ACTIVE AND WELL-INTEGRATED PRIVATE/BUSINESS AVIATION SECTOR. QE HAS RECENTLY INDUCTED G700 INTO THEIR FLEET REDEFINING LUXURY AND COMFORT FOR THEIR CUSTOMERS.

AIRLINES, AROUND THE GLOBE, YET TO INTEGRATE BUSINESS AVIATION INTO THEIR OVERALL OPERATIONS, MAY TAKE NOTE OF SUCH PROGRESS. PAGE 8

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YOU'RE AN INNOVATOR. TIME TO FLY LIKE IT.

G700™

Farther: 7,750 nm/14,353 km[1]
Faster: Mach 0.935[2]

Request your private consultation

[1]NBAA IFR theoretical maximum range at Mach 0.85 with 8 passengers, 4 crew and NBAA IFR reserves. Actual range will be affected by ATC routing, operating speed, weather, outfitting options and other factors.
[2]Maximum Operating Mach Number.

Gulfstream™

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Subscription/Circulation
Annual Inland: ₹1,200 • Foreign: US$320

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TABLE OF CONTENTS

SP's aviation
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COVER IMAGE
Gulfstream G700 during induction ceremony of Qatar Executive (QE). This corporate jet subsidiary of Qatar Airways Group becomes the worldwide exclusive commercial operator of the aircraft.

*(**Cover Photo**: Rohit Kapur)*
COVER DESIGN BY: *SP's Team*

CIVIL

BUSINESS AVIATION

SHOW PREVIEW

ENGINES

REGULAR DEPARTMENTS

BACA Awards 2017
SPECIAL
CONTRIBUTION TO BUSINESS AVIATION

Aerospace Media Awards — Asia
11th February 2020 – Singapore

NEXT ISSUE: *Independence Day 2024 Special*

Qatar Executive (QE) became the first global customer of Gulfstream G700 and has inducted the plane in its operations. Commercial Airlines around the world should expand their operations into Business Aviation, learning from QE, a highly successful corporate jet subsidiary of Qatar Airways, itself a very successful commercial airline.

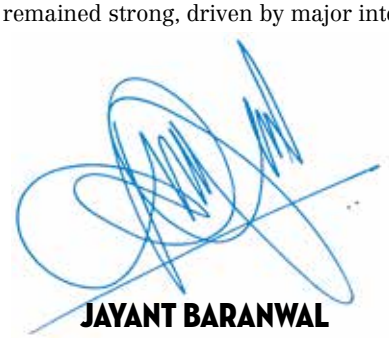
THE LEAD STORY IN THIS ISSUE IS THE INDUCTION OF THE latest Gulfstream G700 into the fleet of Qatar Executive (QE). The G700 represents the future of private air travel, offering a superior flying experience with unrivalled design, technology, comfort and style. The induction of G700 is a fitting addition to Qatar Executive's already ultra-modern-fleet and also a testament to QE's consistent drive to deliver excellence. Also included is a perspective from QE itself on how their adoption of G700 reflects its relentless commitment to excellence and its strategy to remain at the forefront of the industry, by providing its clients with an unparalleled booking and travel experience. Additionally, there is a detailed report on the Gulfstream G700, celebrating its record-breaking performances, unmatched cabin comfort, and cutting-edge technology.

The new leadership team at India's Ministry of Civil Aviation steps in at a pivotal moment for the aviation sector, which is currently experiencing unprecedented growth in both commercial and business aviation in India. Their primary task will be to sustain this momentum and ensure that the growth remains unimpeded. To achieve this, they must focus on strengthening and expanding the country's aviation infrastructure and ecosystem, addressing challenges such as airport capacity, air traffic management, and regulatory frameworks. By fostering innovation and maintaining high standards of safety and efficiency, the leadership can support a thriving aviation industry that continues to meet the increasing demands of travelers and businesses alike. Swaati Ketkar has done a detailed story on what the Aviation sector expects from the new Minister.

One of the most important events on the global aviation scene in the domain of both military and civil aviation that is being held from July 22 to 26 this year, is the biennial Airshow at Farnborough Airport. With 1,200 exhibiting companies and 74,000 trade visitors expected, FIA2024 is ready to again serve as a vital platform for global connections, interactions, and business opportunities. From aviation to defence, sustainability to innovation, expert insights to opportunities for young professionals, displays to discussions and deals, FIA2024 promises a comprehensive showcase of all things aerospace. With stunning flying displays and aircraft on static views and special sections for Space, Advanced Air Mobility and other innovations, FIA2024 will be a huge draw for aviation enthusiasts as well. Ayushee Chaudhary brings you a preview of what to expect at this gala event, in this issue of the magazine.

In this issue, Air Marshal Anil Chopra (Retd) discusses the future of aircraft engines, the most crucial and expensive component driving the aviation industry's green transition. From conventional upgrades to innovative designs like open fans, hybrid-electric systems, and hydrogen-burning engines, the next generation of aero engines promises unprecedented efficiency, reduced emissions, and enhanced performance. Chopra's report highlights how leading manufacturers are pioneering diverse approaches to revolutionise aero engine technology, paving the way for a more sustainable future for air travel. Ayushee Chaudhary covers the business aviation landscape through the first half of 2024. The early months of 2024 revealed a multifaceted narrative of continuity and change within the industry. Despite some regional declines, overall activity remained strong, driven by major international gatherings and seasonal factors, demonstrating the sector's resilience and adaptability.

All this and more in this issue of *SP's Aviation*. Welcome aboard and we wish you many happy landings!



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Owned, published and printed by Jayant Baranwal, printed at Kala Jyothi Process Pvt Ltd and published at A-133, Arjun Nagar (Opposite Defence Colony), New Delhi 110003, India.

THE NEW CIVIL AVIATION MINISTER NEEDS TO FOCUS ON FACILITATING THE GROWTH OF CIVIL AVIATION TO REALISE THE AMBITIOUS PLANS OF INCREASING THE NUMBER OF AIRPORTS AND INTRODUCING HUNDREDS OF NEW AIR ROUTES

NEW LEADERSHIP TO CHART THE COURSE

The new Civil Aviation Minister will need to rise to the challenges and fulfill the demands of India's thriving aviation sector

By SWAATI KETKAR

AMONGST THE ROAR OF JET ENGINES ECHOES ACROSS INDIA and passenger traffic on a record-breaking climb, India recently witnessed the return of Modi 3.0 governance with the reins of the booming Indian aviation sector switching to one of the youngest ministers in Modi cabinet – 36-year-old, Kinjarapu Rammohan Naidu, India's new Civil Aviation Minister. Experts believe he has a host of challenges as the new minister of civil aviation and will need to rise to the challenges of the industry.

COMMERCIAL AVIATION: A PHOENIX RISING

"India's new Civil Aviation Minister enters the ministry at an opportune time," says Prakash Babu Devara, Director of Product Marketing at Cognitus. "The industry outlook is quite positive," he adds, "but there are significant challenges that need to be navigated to sustain growth."

India has one of the largest aircraft orders globally—1,150 aircraft by 2035—but the country's infrastructure must be robust enough to handle the increased aircraft and passenger demand. Developing a sound aviation ecosystem is one of the biggest challenges facing the new minister. Additionally, there's a pressing demand from Middle Eastern carriers for more bilateral flying rights. "Considering this boom, we hope the new minister will address the ongoing demand from the UAE and Qatar for more bilateral flying rights," says Jaideep Mirchandani, Chairman of SkyOne. "We seek a balanced approach that promotes fair competition and growth for all stakeholders."

PHOTOGRAPH: RAMMNK / X

BUSINESS AVIATION: A GLITTERING FUTURE

While commercial aviation caters to the masses, business aviation offers a bespoke experience for the chosen few. CEOs with packed schedules and executives juggling multi-million dollar deals find solace in the time-saving magic of private jets. "Business aviation isn't just a luxury," says Sadaf Herekar, Executive Director of Plexus Aviation. "It's an indispensable tool for economic leaders, a crucial driver of India's growth." It's a sentiment echoed by industry veterans. Atiesh Mishra, Founder and Director of AJM Jet Management, paints a picture with statistics: "From a marginal 1-2 per cent growth in business jet fleets between 2010 and 2021, we've seen a surge to 10-12 per cent since 2022. Our fleet size currently stands at 164 jets, and it's only going up."

The recent "wedding of the century" - the Ambani extravaganza - served as a microcosm of India's booming business aviation scene. Reports suggest Mukesh Ambani arranged a fleet of 100 planes, including 3 Falcon 2000 jets from Club One Air, to ferry elite guests across the country. Now with the upcoming Vidhan Sabha elections across various states in India, time could not have been more right for the new minister of civil aviation to take charge and address the concerns of business aviation fraternity.

This kind of demand, however, exposes the sector's soft underbelly – a system riddled with red tape. "Government policies and regulations primarily focus on the mass market and scheduled airlines," explains Arun Kashyap, Founder and Promoter of newly launched Sirius Aviation. "The private business jet segment, despite thriving on the demand from high-net-worth individuals and corporate leaders, faces an uphill battle."

INDIA'S NEW CIVIL AVIATION MINISTER: THE REINS OF THE BOOMING INDIAN AVIATION SECTOR HAVE BEEN HANDED OVER TO KINJARAPU RAMMOHAN NAIDU

A CHORUS OF DEMANDS: STREAMLINING THE SKIES

The industry has a clear message for the new Minister of Civil Aviation: streamline the processes! Experts like Herekar urge the implementation of tax incentives and a reduction in duties on aircraft imports and maintenance. "This would make operating and maintaining private charters in India more financially viable," she argues. Mishra echoes the sentiment, advocating for a reduction in GST applicable to business aircraft charters to create a level playing field with international operators. The approval and licensing process is another major bottleneck. "It can take days, sometimes weeks, even months," sighs Herekar. "This creates frustration for both private charter companies and their clients." Simplifying and expediting these processes, along with providing clear and consistent regulations, is at the top of the industry's wishlist. Interestingly Rajan Mehra, Chief Executive, Club One Air expects the minister to look into a matter that's not entirely in his control. "If the new minister can put enough pressure on the Oil minister, Finance minister and States (because the States are a stakeholder) to bring fuel under GST, that would be his biggest achievement."

Lovejeet Singh, Partner, Corporate & Aviation at Chandhiok & Mahajan has urged the minister to consider full implementation of Cape Town Convention. Although October 3, 2023 notification was issued to give comfort to lessors when it comes to re-possession and it has also been tested in Go Air case by the Delhi High Court, the lessors still want to see full implementation of Cape Town Convention. Singh also wants the new MoCA to speed up the implementation of fractional ownership policy. "The draft guidelines were issued a while back but the DGCA is yet to issue the final version," Singh says. "The implementation of fractional ownership policy will be a boom for the private aviation," Singh further adds. Supporting Singh's statement Herekar also feels that the government should encourage ownership of aircraft and streamline management and operations.

Kashyap's expectations are in the form of four-point plan for the ministry. They are:

- **Increased Slot Availability:** Ensuring a minimum of five slots per hour during peak traffic times would enhance operational flexibility.
- **Streamlined Clearances:** Implementing single-window time-bound clearances for non-scheduled permit services at the Directorate General of Civil Aviation (DGCA) and the Airport Authority of India (AAI) would expedite processes.
- **Addressing Monopolistic Practices:** Removing monopolistic practices at airports (such as Ground Handling Agencies and maintenance agencies) would promote fair competition.
- **Alignment with International Standards:** Streamlining policies in line with the European Union Aviation Safety Agency (EASA) and the Federal Aviation Administration (FAA) rules would enhance efficiency and safety.

Looking at the above four-points Kashyap feels that implementing thoughtful policy changes can further boost this sector and contribute to India's emergence as a global leader in aviation. Summing up the policy reforms, Herekar states that the Minister should focus on policies that encourage the growth of the private charter sector, such as subsidies or grants for new operators and startups.

INFRASTRUCTURE FOR GROWTH

Business aviation isn't just about luxury travel; it's a pillar of economic development. "This sector can actively promote economic activity and generate employment," emphasises Mehra. Dedicated infrastructure, including exclusive terminals, hangars, and parking spaces at major airports, is a pressing need. Herekar emphasises the importance of promoting private charters not just as a luxury but as a viable and efficient mode of transport for business and leisure, attracting both domestic and international clientele.

Mehra goes a step further, "The current focus seems to be on large cities," he observes. "Small business jets often need to access remote towns where industrialists are setting up

PHOTOGRAPH: RAMMNK / X

plants. Tier II and Tier III airports, even some remote locations, deserve the same priority as larger hubs." Herekar echoes this sentiment, highlighting the need for enhanced regional airport infrastructure to support private charter operations in underserved and remote areas, ultimately promoting better connectivity and economic development in those regions.

"Anything can happen in business aviation," Mehra continues, his voice filled with a hint of excitement. "A business leader traveling on a small plane could end up launching a large industry in a small town, leading to a huge employment generation and a ripple effect on further infrastructure development in terms of roads, hotels, shopping malls, etc."

AIRPORT DEVELOPMENT

Developing more Indian hubs like Dubai is another major issue. Funding for expansion at private airports remains a concern. Mirchandani hopes the ministry will prioritise developing Indian hubs to rival those in Dubai and Doha. "This includes securing funding for airport expansions and solving resource shortages, such as pilots, engineers, and air traffic controllers, to support rapid growth," he says.

"The Minister needs to focus on facilitating the growth of civil aviation to realise the ambitious plans of increasing the number of airports and introducing hundreds of new air routes," says Subir Hazra, Chief Commercial and Strategy Officer at GMR Services, GMR Group. "MoCA should design policies and take initiatives to develop major Indian airports as global transit hubs to boost international traffic, rival the world's premier aviation hubs, and increase operational efficiency," Hazra echoes Mirchandani's thoughts. He outlines the following priorities for the new minister:

- Full support for airport operators to modernise and extend non-aeronautical services.
- Prioritising airport land development to compete with world-class standards, benefiting both the aviation industry and the nation's overall economic development.

Additionally, the government's plan to lease out 13 airports to private players has been on hold for four years. Mirchandani hopes the ministry will expedite this plan. "We hope the revival will be quick, as it is crucial for modernising our aviation infrastructure and enhancing operational efficiency," he says.

Arvind Chandrashekhar of Lufthansa Consulting sums it up: "Reinvigorating asset development and capacity expansion, including reinitiating stalled airport privatisation, are key areas the new minister needs to focus on."

TAKING FLIGHT WITH TECHNOLOGY

The digital revolution hasn't spared the aviation industry, and India needs to embrace it wholeheartedly. Herekar laments the fact that many Indian airports still lack basic amenities like automation in booking and ground handling. Upgrading air traffic management systems (ATMs) to next-generation technologies like satellite-based navigation (SBN) will be crucial for streamlining operations and ensuring efficiency. Advanced technologies like artificial intelligence (AI) can be harnessed to optimise flight paths, predict maintenance needs, and personalise passenger experiences in business aviation. Machine learning algorithms can help streamline operations and improve safety across the board.

Investment in digital infrastructure, from cloud computing to robust cybersecurity measures, is essential. Ritesh Agarwal, CEO of a leading aviation technology company, emphasises, "Embracing automation in areas like air traffic management and baggage handling will be key to enhancing efficiency and reducing costs." This will not only benefit business aviation but also the commercial sector, creating a more seamless travel experience for all.

DEVELOPING A SOUND COMMERCIAL AVIATION ECOSYSTEM IS ONE OF THE BIGGEST CHALLENGES FACING THE NEW MINISTER

THE UNTAPPED POTENTIAL OF HELICOPTERS

Helicopters, the workhorses of the skies, often get sidelined in the conversation about business aviation. However, Captain Peeush Kumar, Executive Pilot at Chipsan Aviation Private Limited, believes their time is nigh. "The government and stakeholders are finally realising the importance of helicopters, not just for transportation but for overall business and economic growth," he asserts.

Kumar identifies several areas where the MoCA can unlock the true potential of helicopters in India. First, he calls for an electronic platform at the DGCA and AAI that allows operators to address concerns about process delays, application rejections, and outdated regulations. "Currently, the system lacks accountability and transparency," he explains. "There's no forum to raise these issues, leading to unnecessary costs and delays for both operators and personnel." Audits at DGCA and AAI, with a focus on scrutinising timelines and rejected applications, are another recommendation Kumar makes.

PHOTOGRAPH: DELHIAIRPORT / X

The RCS-UDAN scheme, aimed at promoting regional connectivity, has been lauded for its vision. However, Kumar argues that it hasn't fully embraced the potential of helicopters. "Sub-400 km sectors under RCS-UDAN have a low sustainability rate," he points out. "This distance is perfectly suited for helicopter operations. Enabling technology is already available at Indian airports, but helipads remain neglected. This is a missed opportunity." Kumar proposes a comprehensive deployment of helicopters under the RCS-UDAN scheme, utilising Performance Based Navigation (PBN) based operations for all-weather, day-night connectivity, ultimately strengthening the scheme's regional reach.

Finally, Kumar urges the AAI to establish a dedicated section or directorate for helicopter growth, similar to what exists for the DGCA. "This would demonstrate a commitment to the sector and ensure accountability towards maximising its national benefits," he concludes.

THE NEW MINISTER SHOULD FOCUS ON POLICIES THAT ENCOURAGES THE GROWTH OF THE PRIVATE CHARTER SECTOR

PHOTOGRAPH: CIAL

MRO ECOSYSTEM TAKES OFF

While the spotlight often shines on passenger travel, a crucial yet less-discussed aspect of aviation is Maintenance, Repair, and Overhaul (MRO). "A robust MRO sector is the backbone of a thriving aviation industry," explains Anand Kumar, CEO of SkyTech MRO. "It ensures the airworthiness of aircraft, minimises downtime, and keeps them flying safely and efficiently." However, the Indian MRO sector faces challenges. High import duties on spare parts and a lack of skilled technicians can lead to delays and drive up maintenance costs. Experts urge the government to offer tax breaks on MRO imports and invest in skill development programs to create a pool of qualified technicians.

CARGO TAKES FLIGHT: THE UNDISPUTED WORKHORSE

The aviation industry isn't just about transporting people; it's the lifeblood of global trade. Cargo plays a vital role in India's economic growth story. "The demand for air cargo has been phenomenal, especially for essential goods and pharmaceuticals during the pandemic," says Mihir Thadhani, Head of Cargo Sales at a leading Indian airline. "E-commerce is also a major driver, and we expect this growth to continue." Experts believe that streamlining customs clearance processes and developing dedicated cargo terminals at major airports will further boost India's cargo handling capabilities.

SKILLING A WORKFORCE FOR THE FUTURE

A skilled workforce is the fuel that propels the aviation industry forward. "The current education and training infrastructure needs a significant upgrade," says Captain Rohit Prakash, Director of Training at a leading Indian flight school. "We need more government-supported training programs and industry collaboration to bridge the gap between theoretical knowledge and practical skills required for various aviation roles, from pilots and engineers to air traffic controllers and ground handling staff."

FINANCIAL TURBULENCE AND TAILWINDS

The Indian aviation sector has weathered the storm of the pandemic and is now experiencing a period of financial recovery. However, challenges remain. "Fuel price fluctuations and currency volatility continue to exert pressure on airline profitability," says Shashank Sharma, a leading aviation analyst. "Airlines need to adopt innovative cost-cutting measures and explore fuel hedging strategies to mitigate these risks." The growth of the low-cost carrier (LCC) segment is a positive indicator, offering passengers greater affordability and airlines improved load factors. Industry experts believe that a stable regulatory environment and access to affordable financing will be crucial for sustained financial growth in the sector.

A COLLABORATIVE TAKE-OFF

India's new Civil Aviation Minister steps into office at a pivotal moment. The aviation industry is experiencing significant growth, bolstered by the nation's extraordinary economic progress and increasing global influence. Also, studies forecast a substantial rise in the number of millionaires in India, leading to a surge in investable wealth. This positive outlook is tempered by challenges that require strategic management to maintain momentum.

Given this landscape, the new minister's role is critical. Expectations are high for fostering a supportive environment for the commercial aviation and private charter sectors. This includes ensuring regulatory ease, providing infrastructural support, and implementing policy initiatives that drive growth and development. With a shared vision and a commitment to excellence, India's skies can become a canvas for a thriving aviation ecosystem, connecting people, businesses, and ideas like never before. SP

QATAR EXECUTIVE RECENTLY ADDED THE MUCH-ANTICIPATED GULFSTREAM G700 TO ITS FLEET IN A GRAND REVELATION AT AN EXCLUSIVE EVENT AT HAMAD INTERNATIONAL AIRPORT, DOHA

QATAR EXECUTIVE INDUCTS ALL-NEW G700S

Combining the Qatar Airways Group's signature personalised service with leading operational safety and management, the G700 is a fitting addition to Qatar Executive's already ultra-modern-fleet

By **AYUSHEE CHAUDHARY**

PHOTOGRAPH: QATAR EXECUTIVE

QATAR EXECUTIVE, THE CORPORATE jet subsidiary of Qatar Airways Group, continues to set the bar high in business aviation by delivering unparalleled customer service and maintaining a fleet that is both young and state-of-the-art. In a move that underscores this commitment, Qatar Executive recently added the much-anticipated Gulfstream G700 to its fleet, showcasing it in a spectacular reveal event in the month of May, 2024.

The next-generation Gulfstream G700, which received FAA certification less than a month ago, has officially joined the Qatar Executive fleet, with the first two aircraft already delivered to customers and more on the way.

As the demand for top-tier private jets climbs, the overall customer experience remains crucial. Qatar Executive not only prides itself on having one of the youngest fleets in the industry but is also renowned for its exemplary customer service from booking to disembarkation.

QATAR AIRWAYS GROUP CHIEF EXECUTIVE OFFICER, ENGR. BADR MOHAMMED AL-MEER WELCOMED THE GULFSTREAM G700 INTO THE QATAR EXECUTIVE FLEET

The Gulfstream G700 made its grand revelation in Doha at an exclusive event at Hamad International Airport. Qatar Executive is currently the only international operator offering the ultra-modern G700 on a private charter basis and was the first Gulfstream customer to receive this aircraft.

Qatar Airways Group Chief Executive Officer, Engr. Badr Mohammed Al-Meer, stated, "We welcome the industry's highest performance ultra-long-range business jet, Gulfstream G700 aircraft to the Qatar Executive fleet. We are proud to enhance our existing fleet of 15 Gulfstream G650ER aircraft to include the pinnacle of business aviation excellence and look forward to seeing our guests on board soon to experience this technologically advanced aircraft."

The G700 represents the future of private air travel, offering an exceptional flying experience with unmatched design, technology, comfort, and style. The aircraft features a spacious passenger cabin with four distinct living areas, including a private rear stateroom with a fixed bed, as highlighted by Qatar Executive.

The new G700 was prominently displayed at the 2024 European Business Aviation Convention & Exhibition (EBACE) in Geneva, Switzerland, Europe's premier on-demand aviation and advanced air mobility event. Notably, it was the only jet at EBACE not fenced off, allowing attendees to view it up close.

Powered by Rolls-Royce's Pearl 700 engines, the G700 can reach speeds of Mach 0.925 (709 mph) and has a range of 8,630 miles, making it one of the farthest-reaching jets in the industry. The enhanced flight vision system, located beneath the cockpit window, aids pilots in landing under low-visibility conditions.

Al-Meer also commented, "Ultimate luxury, highest levels of personalised service and comfort, privacy and convenience through flexible and individual travel to any place in the world. Today, Qatar Executive offers its most discerning passengers the epitome in elite luxury travel. As part of the Qatar Airways Group, Qatar Executive offers the exclusivity and comfort of a private jet and the global expertise and proven track record of an award-winning five-star airline."

Qatar Executive has officially welcomed the delivery of four Gulfstream G700 aircraft, making it the exclusive commercial operator of the aircraft worldwide. The company expects an additional six G700s to be delivered soon. The new G700 fleet is ready to enter full commercial service in the second half of the year, and Qatar Executive is already receiving advance interest from clients wishing to charter the aircraft.

> Qatar Airways Group Chief Executive Officer, Engr. Badr Mohammed Al-Meer, stated, "Today we welcome the industry's highest performance ultra-long-range business jet, Gulfstream G700 aircraft to the Qatar Executive fleet."

Gulfstream President Mark Burns remarked, "Qatar Executive has been a valued Gulfstream customer for nearly 10 years. We are honored to have them as our international partner for the launch and first deliveries of the all-new G700. We look forward to growing their fleet in the months ahead."

ELEVATING PASSENGER EXPERIENCE

Qatar Executive consistently upholds one of the highest standards of service in the industry. Coupled with top-tier personalised service and excellence in operational safety and management, the addition of the G700 to Qatar Executive's

PHOTOGRAPH: QATAR AIRWAYS

GULFSTREAM PRESIDENT MARK BURNS COMMENDED QATAR EXECUTIVE AS THEIR INTERNATIONAL PARTNER FOR THE LAUNCH AND FIRST DELIVERIES OF THE ALL NEW G700

already ultra-modern fleet underscores the company's relentless pursuit of excellence.

This high standard of service is rooted in extensive industry experience. As the private jet charter division of the esteemed and award-winning Qatar Airways, Qatar Executive has always excelled in creating exceptional private jet experiences. Since its inception in 2009, Qatar Executive has grown steadily to become one of the world's leading charter companies, expanding its reach while maintaining high-quality service for its loyal clientele.

Understanding the value of time for private jet travelers, QE and Gulfstream prioritise flexibility from the initial inquiry. Available 24/7, their services cater to clients worldwide, regardless of time zone. With extensive experience serving C-Suite and ultra-high-net-worth individuals, Qatar Executive builds efficient relationships with personal assistants and agents. Passengers can specify their preferred departure and destination points, often selecting lesser-known airports to save valuable travel time. Qatar Executive's commitment to flexibility extends to every aspect of the journey, ensuring streamlined boarding, accommodating unusual flight times, and reaching uncommon destinations, all designed to maximise the customer's time efficiently. Gulfstream G700's range further enhances time savings. Fewer flight hours mean longer intervals between scheduled maintenance visits, higher potential aircraft value, and fresher crews.

As private jet travel becomes more mainstream, frequent flyers have higher expectations. Beyond efficiency, the ability to personalise every detail is a significant attraction. Qatar Executive allows passengers to tailor their flights extensively, making the aircraft feel like home. Additionally, the G700 comes handy in making it more customised and convenient for the customers for instance the aircraft can comfortably accommodate up to 19 passengers and provide sleeping arrangements for up to 13.

Qatar Executive excels in post-flight service by building strong relationships with loyal customers. Crew members take note of passengers' preferences, ensuring future flights are tailored to their liking without needing to ask. This personalised approach streamlines the booking process and enhances the overall experience.

The bespoke cabins of the G700 have been meticulously crafted to meet the highest standards of Qatar Executive's most discerning customers. The passenger experience is enhanced by a revolutionary lighting system, the industry's lowest cabin pressure altitude, and natural lighting through 20 windows. The G700's cabin can be pressurised to 2,916 feet, the lowest altitude of any business jet, reducing the effects of fatigue and jet lag. Qatar Executive describes the cabin as "whisper-quiet," thanks in part to the flush design of the overwing emergency exit. Additionally, the G700 offers 100 per cent fresh air replenished every 2-3 minutes and an ionising system for the cabin air, providing the highest air quality possible in a business jet, ensuring passengers arrive more refreshed than with any other aircraft type.

Al-Meer further added, "With an ultra-modern fleet, Qatar Executive provides a service using only the most advanced business jets, specialising in long and ultra-long range travel. Each aircraft is equipped with cutting-edge technologies, exceptional facilities, and the finest materials and fittings, coupled with the ultimate in luxury and sophisticated service. At Qatar Executive, we are confident that with this exceptional way of flying, tailored to your requirements, we will consistently exceed your expectations whenever you choose to fly with us."

> **Gulfstream President Mark Burns remarked, "Qatar Executive has been a valued Gulfstream customer for nearly 10 years. We look forward to growing their fleet in the months ahead."**

The G700 represents the future of private air travel, offering a superior flying experience with unrivaled design, technology, comfort, and style. The aircraft features an exceptionally spacious passenger cabin with four distinct living areas, including a dedicated private rear stateroom with a permanent fixed bed.

Qatar Executive combined with Gulfstream G700 promises to be a combination that the business aviation customers will love to have. SP

PHOTOGRAPH: QATAR AIRWAYS

THE G700 IS ONE OF THE MOST ADVANCED BUSINESS JETS AVAILABLE TODAY, FEATURING THE LARGEST CABIN IN ITS CLASS, SUPERIOR DESIGN, PERFORMANCE, AND TECHNOLOGICAL ADVANCEMENTS

QATAR EXECUTIVE REDEFINING PRIVATE JET LUXURY

PHOTOGRAPHS: QATAR EXECUTIVE

Qatar Executive's adoption of G700 reflects its relentless commitment to excellence and its strategy to remain at the forefront of the industry, by providing its clients with an unparalleled booking and travel experience.

By **QATAR EXECUTIVE**

IN APRIL 2024, QATAR EXECUTIVE (QE), the private jet charter division of Qatar Airways, marked a significant milestone in its history by becoming the first global launch customer for the Gulfstream G700 after taking delivery of its new G700 at the Gulfstream facility in Savannah, Georgia. The G700 is one of the most advanced business jets available today & is the flagship of the Gulfstream range. Since that time QE has taken a further three new G700's into its fleet with another six yet to be delivered over the coming months. This move not only underscores Qatar Executive's commitment to offering unparalleled luxury and state-of-the-art technology to its clientele but also highlights the G700's superior design, performance, and technological advancements.

The Gulfstream G700, which was first unveiled in October 2019, boasts the largest cabin in its class, providing an unmatched level of comfort and flexibility. The aircraft can accommodate up to 13 and sleep up to 8 passengers. The spacious cabin is complemented by 20 panoramic windows that flood the interior with natural light, creating a serene and productive environment for both working and relaxing.

QATAR EXECUTIVE HAS INTEGRATED THE G700 INTO ITS FLEET, EMPHASIZING ITS STRATEGY OF OFFERING TECHNOLOGICALLY ADVANCED AND COMFORTABLE JETS COMBINED WITH UNPARALLELED SERVICE

A PARTNERSHIP IN INNOVATION AND EXCELLENCE

Qatar Executive's decision to integrate the G700 into its fleet aligns with its strategy of maintaining a fleet of the most technologically advanced and comfortable jets in the world – combined with the unparalleled service of QE cabin crew, the experience offered is always second to none. The G700 is powered by Rolls-Royce Pearl 700 engines, which offer exceptional efficiency and reliability. It has a maximum range of 7,750 nautical miles at Mach 0.85, allowing nonstop flights from Doha to New York or Tokyo, making it ideal for ultra-long-range & long-range travel. Additionally, the jet's top speed of Mach 0.90 ensures swift travel times, further enhancing its appeal to high-end clients who value both time and comfort.

For QE, the acquisition of the G700 reinforces its position as a leader in the business jet charter market. The company already operates a dominant fleet of Gulfstream aircraft, including fifteen G650ER, also known for their long-range capabilities and beautifully designed interiors. With the addition of the G700, QE is able to offer an even more extensive range of options to its clients, catering to their varying needs and preferences.

The entry into service of the G700 with Qatar Executive also signifies a broader trend in the business aviation industry, where there is a growing demand for aircraft that combine long-range capabilities with exceptional cabin comfort and advanced technology. As businesses and high-net-worth individuals increasingly seek efficient, private and timely travel solutions, the G700 is ideally positioned to meet these demands.

> The entry of the G700 into service with Qatar Executive signifies a broader trend in the business aviation industry towards long-range capabilities, exceptional cabin comfort, and advanced technology

A NEW BENCHMARK IN BUSINESS AVIATION

QE's role as the launch customer for the G700 is not just a commercial transaction; it is a partnership that emphasizes innovation and excellence. Gulfstream's commitment to outstanding aeronautical engineering, and QE's dedication to providing the ultimate in private jet travel experiences, create a perfect synergy to deliver an unparalleled service to the client.

In conclusion, the entry into service of the Gulfstream G700 with Qatar Executive marks a significant development in the business aviation sector. With its unmatched combination of range, speed, cabin comfort, and technology, the G700 redefines standards in private jet travel. Qatar Executive's adoption of this aircraft reflects its relentless commitment to excellence and its strategy to remain at the forefront of the industry, by providing its clients with an unparalleled booking and travel experience. SP

ALL ABOUT GULFSTREAM G700

The Gulfstream G700, already renowned for its record-breaking performance, unparalleled cabin comfort, and cutting-edge technology, is redefining business aviation with its spacious interior, advanced features, and exceptional range and speed

By **AYUSHEE CHAUDHARY**

THE G700 SETS NEW STANDARDS IN PRIVATE JET TRAVEL WITH ITS EXCEPTIONAL RANGE, SPEED, CABIN COMFORT, AND CUTTING-EDGE TECHNOLOGY

PHOTOGRAPHS: GULFSTREAM

THE G700 IS PERFECTLY SUITED TO MEET THE RISING DEMAND FOR EFFICIENT, PRIVATE, AND TIMELY TRAVEL SOLUTIONS AMONG BUSINESS TRAVELLERS

IN APRIL, GULFSTREAM AEROSPACE CORPORATION MARKED a monumental milestone with the commencement of customer deliveries for the much-anticipated Gulfstream G700. The first four G700 aircraft, now in service, exemplify the pinnacle of business aviation.

"Beginning G700 customer deliveries less than one month after achieving Federal Aviation Administration type certification marks an incredible milestone in Gulfstream's history of raising the bar for the business aviation industry," said Mark Burns, President of Gulfstream. "We appreciate the confidence our customers have demonstrated in our aircraft and look forward to continuing these deliveries in the weeks ahead."

The Gulfstream G700 boasts the most spacious cabin in the industry, offering the Gulfstream Cabin Experience which includes 100 per cent fresh air, whisper-quiet noise levels, natural light from 20 Gulfstream Panoramic Oval Windows, and the industry's lowest cabin altitude. The aircraft set more than 50 city-pair speed records before entering service, capable of flying 7,750 nautical miles (14,353 kilometers) at Mach 0.85 or 6,650 nautical miles (12,316 kilometers) at Mach 0.90. With a maximum operating speed of Mach 0.935, the G700 is the fastest aircraft in the Gulfstream fleet.

"We are excited for our customers to experience the unparalleled G700 as we continue to deliver this exceptional aircraft around the world," added Burns.

Following its Federal Aviation Administration (FAA) type certification in March, the G700 also received European Union Aviation Safety Agency (EASA) type certification in May. "The Gulfstream team is proud to add EASA to our growing G700 certification accomplishments," said Burns. "During the flight test programme, we took the G700 across the globe, and the response to the aircraft's cabin size, flexibility, and performance has been outstanding. This EASA certification unlocks G700 deliveries for many more of our international customers, and we are excited to see our next-generation fleet grow around the world."

Before FAA certification, Gulfstream announced significant performance enhancements for the G700, increasing its range to 7,750 nautical miles (14,353 kilometers) at Mach 0.85 or 6,650 nautical miles (12,316 kilometers) at Mach 0.90, gaining 250 nautical miles (463 kilometers) at both speeds over original projections. The G700's maximum operating speed increased to Mach 0.935, making it the fastest in the Gulfstream fleet. Its cabin altitude, already the lowest in business aviation, was reduced to 2,840 feet (866 meters) while flying at 41,000 feet (12,497 meters), providing even more comfort for passengers.

> More powerful, faster, and larger than its peers, it can travel ultra-long distances: over 14,300 kilometers at Mach 0.85

The FAA certification also confirmed additional performance improvements, including a balanced field length take-off distance of 5,995 feet (1,827 meters) and a landing distance of 3,150 feet (960 meters) on a standard ISA day at sea level, both shorter than originally anticipated.

"Receiving these additional clearances so quickly on the heels of FAA type

G700 TECHNICAL SPECIFICATIONS

PERFORMANCE	
Maximum Range	7,750 nm | 14,353 km
Long-Range Cruise	Mach 0.85
High-Speed Cruise Range	6,650 nm | 12,316 km
High-Speed Cruise	Mach 0.90
Maximum Operating Mach Number (Mmo)	Mach 0.935
Takeoff Distance (SL, ISA, MTOW)	5,995 ft | 1,827 m
Initial Cruise Altitude	41,000 ft | 12,497 m
Maximum Cruise Altitude	51,000 ft | 15,545 m
CABIN	
Living Areas	Up to 5
Seats	Up to 19
Sleeps	Up to 13
Cabin Altitude	2,840 ft at 41,000 ft
Gulfstream Panoramic Oval Windows	20
Galley	Forward Ultragalley
Vacuum Lavatory	Forward and Aft
WEIGHTS	
Maximum Takeoff	1,07,600 lb | 48,807 kg
Maximum Landing	83,500 lb | 37,875 kg
Maximum Zero Fuel	62,750 lb | 28,463 kg
Basic Operating (including 4 crew)	56,765 lb | 25,748 kg
Maximum Payload	5,985 lb | 2,715 kg
Maximum Payload/Full Fuel	1,835 lb | 832 kg
Maximum Fuel	49,400 lb | 22,407 kg
SYSTEMS	
Avionics	Gulfstream Symmetry Flight Deck™
Engines	Two Rolls-Royce Pearl 700
Rated Takeoff Thrust (each)	18,250 lb | 81.20 kN
MEASUREMENTS	
Finished Cabin Height	6 ft 3 in | 1.91 m
Finished Cabin Width	8 ft 2 in | 2.49 m
Cabin Length (excluding baggage)	56 ft 11 in | 17.35 m
Total Interior Length	63 ft 8 in | 19.41 m
Cabin Volume	2,603 cu ft | 73.71 cu m
Baggage Compartment Volume	195 cu ft | 5.52 cu m
Exterior Height	25 ft 5 in | 7.75 m
Exterior Length	109 ft 10 in | 33.48 m
Overall Wingspan	103 ft | 31.39 m

Source: Gulfstream

certification showcases how mature the G700 programme is," said Burns. "Thanks to the investments made in advanced manufacturing and interior innovations, operators will benefit from the industry-leading quality, fit, and finish of the G700. We look forward to our customers experiencing firsthand the cabin comfort and performance capabilities of this fine aircraft."

The G700's cabin can be configured with up to five living areas, including a grand suite with an expanded lavatory or the industry's largest ultra galley. The award-winning Gulfstream Symmetry Flight Deck features active control sidesticks and intuitive touch-screen avionics, reducing pilot workload and aircraft startup time. The new Combined Vision System (CVS), shown on the dual head-up display, increases pilot situational awareness and provides access to more airports. Other key safety features include the Predictive Landing Performance System.

Manufactured at Gulfstream's Savannah headquarters, the G700 benefits from advanced production methods, including automation, 3D model designs, and robotic and bonding techniques that ensure unprecedented quality and precision.

"I would also like to extend my thanks to the FAA G700 certification team for their support," said Burns. "On behalf of Gulfstream's more than 20,000 employees worldwide, I am proud and excited to begin our G700 customer deliveries."

The G700 has been making headlines and breaking records since its launch. In February, the aircraft surpassed 50 city-pair speed records en route to the Singapore Airshow. It achieved its 50th speed record on a carbon-neutral flight from Los Angeles to Nice, France, traveling 5,197 nautical miles (9,625 kilometers) in 10 hours and 13 minutes at an average speed of Mach 0.90. The G700 then set its 51st speed record on another carbon-neutral flight from Nice to Singapore, completing the 5,754 nautical mile (10,656 kilometer) trip in just 11 hours and 30 minutes at an average speed of Mach 0.90.

"These latest records once again prove that the G700 can help our customers reach their destinations faster," said Burns.

The flagship of Gulfstream, the G700, is now considered the business jet that breaks all records. More powerful, faster, and larger than its peers, it can travel ultra-long distances: over 14,300 kilometers at Mach 0.85. "Imagine the length of an A319neo, the range of a 787 and a maximum cruising speed 15 per cent higher than a commercial aircraft," explains Thibaud Normand, G700 Nacelle Programme Director at Safran Nacelles. Inside, the G700 features a large modular cabin that can be partitioned into five "rooms," including four "living rooms" with lounge, dining room, suite, bathroom, and toilet. It can accommodate up to 19 passengers in flight.

Gulfstream's aerodynamic wing and all-new winglet, combined with Rolls-Royce Pearl 700 engines and next-generation avionics, support fuel-efficient flight. Gulfstream also leads the industry in sustainability innovation, from new aircraft technology to environmentally responsible practices.

On the propulsion side, Safran supplies Rolls-Royce with the power transmission system and the entire nacelle for the Pearl 700 engines. Safran Aerosystems supports the fuel quantity indication and oxygen systems, while Safran Electronics & Defense contributes the landing gear control levers, illuminated cockpit panels, and the Horizontal Stabilizer Trim System (HSTS). Additionally, the cockpit and cabin tables are produced by Safran Cabin.

The G700's commitment to excellence, performance, and customer satisfaction makes it a game-changer in the business aviation industry, setting new benchmarks for comfort, speed, and innovation. SP

(FILE PHOTO) FLYING DISPLAY AT FARNBOROUGH INTERNATIONAL AIRSHOW

FARNBOROUGH RETURNS TO SKYROCKET ITS 75 YEARS LEGACY

From aviation to defence, from sustainability to innovation, from experts' excerpts to opportunities for young professionals, displays to discussions and deals, FIA is certain to be a buffet of all things aerospace

By AYUSHEE CHAUDHARY

PHOTOGRAPH: AIRBUS

THE FARNBOROUGH AIRSHOW, ESTABLISHED IN 1948, HAS become a premier event in the aviation world occurring biennially. The Farnborough International Airshow (FIA) 2024 stands as a beacon of innovation, showcasing the latest advancements in aviation, space exploration, and defence technology. In 2022, the show attracted over 80,000 trade visitors and boasted more than 1,500 exhibitors from around the globe. Even when COVID hit the world, the show took an entirely virtual form but continued to connect the industry. With 1,200 exhibiting companies and 74,000 trade visitors expected, FIA2024 is ready to again serve as a vital platform for global connections, interactions, and business opportunities.

75 YEARS OF AVIATION INNOVATION AND CONNECTION

Farnborough International Airshow celebrated 75 years of pioneering aviation and innovation on September 7, 2023. It was in 1948 that The Society of British Aircraft Constructors (SBAC), chose Farnborough as its new home for its growing airshow. The first event took place between the September 7-12, 1948 which featured sixty-six different British aircraft, including the launch of the Cierva W.II Air Horse, across the static and flying display.

Since its launch, Farnborough has been a home of historic firsts for the aerospace industry, including the launch of the world's first jet airliner de Havilland DH.106 Comet 1 in 1949, the Black Arrows' record-breaking 22-aircraft formation loop in 1958, BAC-Aerospatiale Concorde's triumphant Farnborough debut in 1970 with a low fly pass over spectators and the Airbus A380 debut in 2006. Fast forward 75 years, FIA is a catalyst for the evolution of the aerospace industry and is the global platform for showcasing technological breakthroughs and feats of engineering. It is also where historic partnerships are made, and goals such as sustainable aviation are pursued. The iconic airshow convenes more than 74,000 global aerospace, political and military leaders plus international media, from over 100 countries, in the very same location as the first event three quarters of a century ago.

Keeping up with this legacy, the FIA2024 is centered around six key themes, addressing critical issues in the aerospace industry:

Space. With everything from deep space exploration to commercial flights commanding the global headlines, how we utilise space technology in the years to come is a more vital question than ever before. As the world beyond our skies becomes more accessible to businesses around the world, the increasing commercialisation of space, the development of new international spaceport infrastructure and the ever-moving boundaries of what is possible in the sector will be explored at FIA2024. The Space Zone, hosted in one of the site's state-of-the-art sound stages, always proves to be one of the most popular and successful parts of the show. Featuring exhibitors from a wide range of space-driven companies and Space Agencies from around the globe, the variety of ideas being shared and showcased is immense. The dedicated Space Theatre will also host a packed schedule of pioneering and engaging content, welcoming inspirational speakers and key figures from the space industry.

Addressing the success and attention that the Space Zone has received at FIA and the advancement that the industry is going through, a separate Farnborough International Space Show is being planned to be launched in March 2025. The annual space industry event is being designed to pioneer the commercial space age and advance space domain defence. Building on FIA's trusted convening power across global advanced manufacturing sectors, defence and government, the Space Show aims to be delivered for the sector, by the sector.

The inaugural Farnborough International Space Show will continue many of the insightful discussions that take place at FIA's Space Zone Theatre during the 2024 airshow.

SHOWCASING THE LATEST IN MILITARY TECHNOLOGIES AT FIA:
FILE PHOTOS: (TOP) LOCKHEED MARTIN F-35; (ABOVE) EMBRAER C-390.

Defence. In a rapidly evolving defence landscape which is pioneering new approaches to tackle the security challenges facing the modern world, it is essential to ensure that the private sector and governments from across the globe are able to convene effectively. FIA2024 is geared to play a vital role in bringing defence companies together with the strategic decision-makers behind military delegations at the show. The latest technological advancements will be on display in the exhibition halls as well as outside in the flying and static displays. Some of the military aircraft to be present at the show include Airbus, CAPA-X and C295; Diamond Aircraft Industries GMBH, DART-750; Embraer, C-390 Millennium and A-29 Super Tucano; Helioperations, Sea King; Lockheed Martin, UH-60M (Black Hawk).

Sustainability. Now more than ever, the impact of climate change and the need for immediate action to safeguard the future of our planet is one of the most pressing issues at the heart of the aerospace industry. Sustainability and the path to Net Zero continues to be a

> From captivating aerial performances to up-close views of cutting-edge aircraft, the flying and static displays at FIA2024 will also offer a glimpse into the future of aviation

PHOTOGRAPHS: ASDS MEDIA, FIAFARNBOROUGH / X

huge driving force at Farnborough, enabling world leaders and industry pioneers to come together and collaborate on the future of aviation. Visitors to FIA2024 will be able to attend thought-leading sessions dedicated to accelerating discussion on sustainability and focusing on the importance of collaboration across global sectors.

Innovation. For over a century, Farnborough has been synonymous with pioneering triumphs across aviation, with the Farnborough International Airshow playing host to a number of important historic milestones. As the industry continually looks to enhance modern life with technological advancements and radical new approaches, FIA2024 acts as a platform for the latest and greatest innovations that are pioneering the future of aerospace. FIA2024 provides a huge global platform to showcase the developments setting the agenda for the industry in the years ahead, discuss the challenges shaping the direction of the sector and debate the best course of action for some of the biggest questions facing aviation.

Future Flight. As the race to develop new future flight technologies accelerates, there is no question that our skies will soon be transformed through advancements in Advanced Air Mobility (AAM) solutions. FIA2024 aims to provide a global platform to showcase the companies redefining and revolutionising the aerospace sector from those pioneers making AAM a reality, to the vital technological advancements being made in R&D and manufacturing. With dedicated exhibition areas for companies, showcases in the conference programmes and displays of these innovations at work, FIA2024 will celebrate the future of flight as it is happening.

Workforce. Following an era of dramatic change across the aerospace industry, the face of the industry's workforce is changing more rapidly than ever before. Gareth Rogers, Chief Executive of Farnborough International says, "With an estimated shortage of over 1,73,000 professionals in the STEM sector, it is vital for the industry to inspire the next generation of leaders and close the skills gap that has been persistent across the last four years." The Workforce theme is an important discussion point throughout the five days at FIA2024 but truly takes centre stage on the last day with the Pioneers of Tomorrow event. Aimed at students and young professionals interested in a career in the sector, this event was created to inspire future generations and enable companies to highlight the opportunities they have on offer. FIA affirms the belief that developing the future of the workforce is an investment in the future of sustainability, growth and prosperity of businesses, communities and societies as a whole. Industries, including aerospace, continuously evolve, requiring a pool of talent with relevant skills and competencies.

By participating in Pioneers in Tomorrow, not only do the students and professionals benefit but even the exhibitors can fill their workplace vacancies by meeting graduates and career movers but also scope out long-term prospects and inspire the younger generations.

The organisers highlighted that the return of the Delegations Programme in 2022 proved to be hugely popular as delegates were able to facilitate networking and business and so will continue for the 2024 edition. At FIA2024, attendees can expect thought-provoking sessions, engaging exhibitions, and opportunities to network with leaders and pioneers in the aerospace sector. The event aims to drive discussion, collaboration, and innovation, shaping the future of aviation for generations to come.

> Keeping up with this legacy, the FIA2024 is centered around six key themes of Space, Defence, Sustainability, Innovation, Future Flight, and Workforce

SIGNING UP MEGA DEALS WITH OPERATORS FOR COMMERCIAL AIRCRAFT AT FIA: FILE PHOTOS: (TOP) BOEING 777; (ABOVE) AIRBUS A350.

PHOTOGRAPHS: BOEING / X, AIRBUS

AN UNPARALLELED SIGHT

The 2024 Farnborough International Airshow promises to be a spectacular event, with an array of aircraft from leading manufacturers and exciting new prototypes on display. Global leaders, including Airbus, Boeing, Rolls-Royce, RTX, GKN and GE Aerospace, will be exhibiting their latest aircraft, innovations and technology at the event. CFM International's participation at the show will feature their RISE programme with its Open Fan Architecture, Hybrid Electric Systems, Compact Core Technology and Alternate Fuel Compatibility.

The Royal Danish Air Force (RDAF) will debut at the Farnborough

DISPLAYING AAM AND BUSINESS AVIATION SOLUTIONS AT FIA:
FILE PHOTOS: (TOP) WISK UAM; (ABOVE) PIAGGIO PRIVATE JET.

International Airshow with its new F-16 Dannebrog aircraft. The E-006, replacing the retired E-191 now aiding Ukraine, features a refreshed livery celebrating the 50th anniversary of the F-16's first flight. While it will display the Danish flag at global events, the E-006 will primarily be used for training and operational missions.

As a major European manufacturer, Airbus is unsurprisingly at the forefront, with its aircraft dominating the airshow's listings. Featured in the lineup are 's A350-900, the A220-300, the A321XLR, and the A330-900. On the military side, Airbus will present the A400M transport plane, along with the Aliaca and Capa-X drones. Additionally, the H135M and H160 helicopters will be part of Airbus's impressive display. Boeing, though more understated initially, is expected to announce more aircraft soon. Currently, Qatar Airways' Boeing 787-9 and Gulfstream G700 are confirmed, adding a touch of luxury to the lineup.

Brazilian manufacturer Embraer will showcase a diverse range of planes, including the E195-E2 and E-Jet freighter on the commercial side, and the KC-390 transport plane and Super Tucano attack aircraft on the military side. ATR will present the 72-600 and 72-600F. Embraer plans to unveil updates for its commercial E-Jets at FIA. These enhancements include lower maintenance costs, cabin upgrades, and more. KLM Cityhopper has reported a 30 per cent fuel reduction with its E195-E2s, influencing airlines like American Airlines.

For light aircraft enthusiasts, Diamond will display the DA-62 and Dart 750, while helicopter fans can look forward to Helioperations' AW139 and Sea King, as well as the Lockheed Martin UH-60M Black Hawk. Turkish Aerospace plans to showcase the Hürjet military trainer and Gökbey, with Textron's King Air 260C completing the first wave.

Dassault Systèmes will announce new developments at the Farnborough Airshow, showcasing the integration of AI into their solutions to drive innovation. They will also host roundtable discussions with customers, focusing on this year's theme, "Securing the Future," and leading conversations on five different themes each day.

Vertical Aerospace, the electric vertical take-off and landing (eVTOL) developer, had announced plans to fly its VX4 prototype at the Airshow. In a letter to shareholders released on November 9, the electric vertical take-off and landing (eVTOL) developer outlined a campaign of "multiple public flight demonstrations" for the piloted VX4 in 2024.

EXPLORING AEROSPACE INNOVATION

At FIA, innovation is sure to take flight as the world's leading aerospace companies gather to showcase groundbreaking advancements in the industry. From space exploration to future flight technologies, the event offers a unique platform for exhibitors to connect with industry leaders and explore new business opportunities through the following key features.

Space Zone. An opportunity to step into the future of space exploration at the Space Zone, where exhibitors and visitors come together to engage with the global space community. Located within one of the show's state-of-the-art sound stages, the Space Zone offers unparalleled networking opportunities and showcases pioneering companies at the forefront of the space industry. Following the success of the Space Zone at FIA2022, which featured insightful presentations from industry experts and notable figures such as ESA Astronaut Tim Peake and NASA Astronaut Charles Duke, the Space Zone at FIA2024 is sure to be a highlight of the event.

Flying & Static Display. FIA is set to bring out the thrill of aviation innovation at the flying and static displays, featuring some of the most advanced aircraft in commercial and military design. With over 90 aircraft on display at FIA2022, visitors had the opportunity to witness firsthand the latest developments in aerospace technology. From captivating aerial performances to up-close views of cutting-edge aircraft, the flying and static displays at FIA2024 will also offer a glimpse into the future of aviation.

With over 1,200 exhibiting companies and 74,000 trade visitors, FIA2024, is ready to again serve as a vital platform for global connections, interactions, and business opportunities

PHOTOGRAPHS: ASDS MEDIA, FIAFARNBOROUGH / X

FINN Sessions. Delve into thought-provoking discussions and presentations at the FINN Theatres, where industry leaders and experts share insights on topics ranging from sustainability to workforce development. As a key feature of the Farnborough International Airshow, the FINN Sessions provide a platform for dialogue and collaboration among stakeholders in the aerospace and aviation community.

Airline Leaders Summit. At the Airline Leaders Summit, global airline executives will come together to discuss key issues and trends shaping the future of the industry. With past speakers including Sir Tim Clark, President of Emirates Airline, and Willie Walsh, Director General of International Air Transport Association (IATA), the Airline Leaders Summit offers invaluable insights into the challenges and opportunities facing the aviation sector.

Pioneers of Tomorrow. Aimed to inspire the next generation of aerospace leaders, Pioneers of Tomorrow is a dedicated STEM-focused event aimed at engaging students and young professionals. Through hands-on activities, career workshops, and inspirational speakers, Pioneers of Tomorrow provides a unique opportunity for attendees to discover the exciting possibilities within the aerospace industry.

AVIATION INDUSTRY FLAG BEARERS AND THOUGHT LEADERS CONVERGE AT FIA TO DISCUSS AND CHART OUT THE FUTURE AT VARIOUS CONFERENCES AND SEMINARS (FILE PHOTOS ABOVE).

SETTING NEW HEIGHTS FOR AEROSPACE EXCELLENCE

In a testament to the soaring optimism within the aerospace industry, the upcoming edition of the Farnborough International Airshow in 2024 is witnessing an unprecedented surge in demand for exhibition space, sponsorship packages, and marketing opportunities, as underlined by the organisers. With commercial revenues projected to surge by 14 per cent year-on-year, the airshow is poised to redefine itself as the premier marketplace for an industry poised for growth.

Despite ongoing challenges in the supply chain, both the aerospace and space sectors are poised for remarkable growth in the coming year. Projections from IATA had anticipated the global airline industry to return to profitability in 2023, with estimated profits reaching $5 billion. Additionally, the Maintenance, Repair, and Overhaul (MRO) sector was forecasted to maintain steady recovery, with executives expecting budgets to remain stable or increase over the next 24 months. Venturing beyond Earth's atmosphere, the global space market has witnessed exponential growth, with its value surging from $280 billion in 2010 to approximately $447 billion. Projections from McKinsey and the World Economic Forum suggest that the space industry could reach a staggering $1 trillion by 2030. All these numbers not only indicate optimism towards the FIA's key themes but also showcase its timely occurrence.

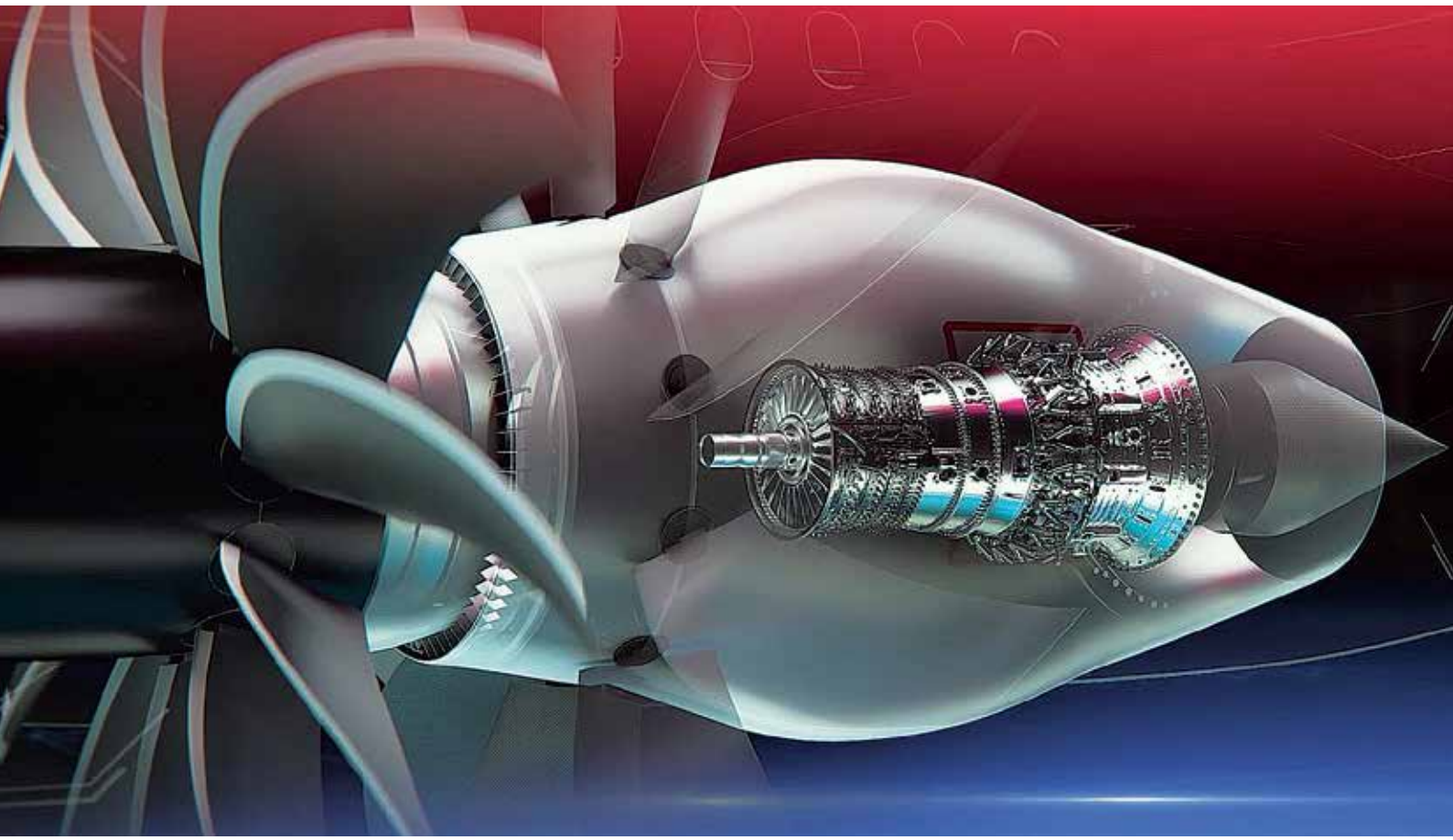
In anticipation of the show, initial industry reports hint at significant announcements which have always been an extremely important part of the show. One of the most noteworthy could be Qatar Airways' large order for new widebody aircraft to bolster its long-haul fleet. Both Airbus and Boeing stand to benefit from such a deal.

> From space exploration to future flight technologies, the event offers a unique platform for exhibitors to connect with industry leaders and explore new business opportunities

The burgeoning demand for exhibition opportunities at the FIA2024 reflect the industry's robust recovery to pre-pandemic levels. With over 90 per cent of commercial exhibition spaces and chalets already reserved, the event is set to welcome a diverse array of industry leaders and innovators from around the globe. To accommodate the unprecedented demand, Farnborough International is also constructing 17 new chalets, with more than half already sold.

Returning from July 22 to 26, 2024, the Farnborough International Airshow promises five days of unparalleled opportunities for industry leaders to explore cutting-edge technology, forge new partnerships, and advance sustainable aerospace initiatives. Against the backdrop of its 75th anniversary, the airshow is ready to take flight towards shaping the future of the aerospace industry for generations to come. As FIA continues to evolve and innovate, it remains a cornerstone of the aerospace calendar, driving progress and shaping the future of aviation for years to come. SP

PHOTOGRAPHS: FIAFARNBOROUGH / X, ESA / P. SEBIROT



THE CFM RISE (REVOLUTIONARY INNOVATION FOR SUSTAINABLE ENGINES) PROGRAMME WILL BE COMPATIBLE WITH 100 PER CENT SUSTAINABLE AVIATION FUEL (SAF), CAPABLE OF HYBRID-ELECTRIC OPERATION, AND POSSIBLY PERMIT RUNNING ON HYDROGEN

NEXT GEN AERO ENGINES

The development of aircraft engines, the most crucial and expensive component, will drive the airline industry's green transition, with options ranging from conventional upgrades to innovative designs like open fans, hybrid-electric systems, and hydrogen-burning engines

By AIR MARSHAL ANIL CHOPRA (RETD)

PHOTOGRAPH: BLOG.GEAVIATION.COM

THE NEXT GENERATION OF AERO ENGINES IS SET TO revolutionise aviation, heralding an era of unprecedented efficiency, reduced emissions, and enhanced performance across both commercial and military sectors. These advanced engines are at the forefront of propulsion technology, promising a cleaner and more sustainable future for air travel. As we delve into the specific technologies and leading products driving this innovation, it becomes evident that the future of flight is being reshaped by these groundbreaking developments.

Central to the design of future civil aerospace engines is a focus on efficiency, which directly impacts fuel consumption, operating costs, and environmental sustainability. Leading engine manufacturers are unveiling new technologies aimed at burning less fuel, reducing CO_2 emissions, and minimising noise. In addition to enhancing engine efficiencies, there is significant exploration into electric and hybrid propulsion systems. With the rise of drones and Urban Air Mobility (UAM) vehicles over populated areas, the aero-acoustics of these engines are

THE NEW GTF ADVANTAGE ENGINE WILL BE THE MOST ENVIRONMENTALLY FRIENDLY OPTION.
PRATT & WHITNEY VIEWS THE GTF'S NEW DESIGNS, WITH HIGHER BYPASS RATIOS, AS THE ARCHITECTURE OF THE FUTURE.

also becoming a crucial design consideration. Advances in propulsion technology are poised to shorten engine development cycles, reduce weight, enhance performance, lower fuel consumption, increase reliability, and extend component life, all while reducing emissions and maintenance requirements. The four leading engine manufacturers are taking diverse approaches as they develop new models, each contributing to the transformative landscape of aero engine technology.

CFM INTERNATIONAL

CFM International, a joint venture between GE Aviation and Safran, were behind the best-selling aircraft engine of all time, the CFM56, and now the high-bypass turbofan LEAP (Leading Edge Aviation Propulsion) engine. LEAP has been flying with components from Ceramic matrix composites (CMC) and has 3D-printed fuel nozzles. CFM has already announced their potential successor which is being hyped as "the future of flight". The CFM new RISE (Revolutionary Innovation for Sustainable Engines) programme will produce the next-generation CFM engine by the mid-2030s. The programme targets are to reduce fuel consumption and carbon emissions by more than 20 per cent while also being 100 per cent compatible with both Sustainable Aviation Fuel (SAF) and hydrogen. The RISE programme would be the first of its kind open-fan architecture that will yield the greatest benefit. It will help optimise engine operation across each segment of flight.

PRATT & WHITNEY

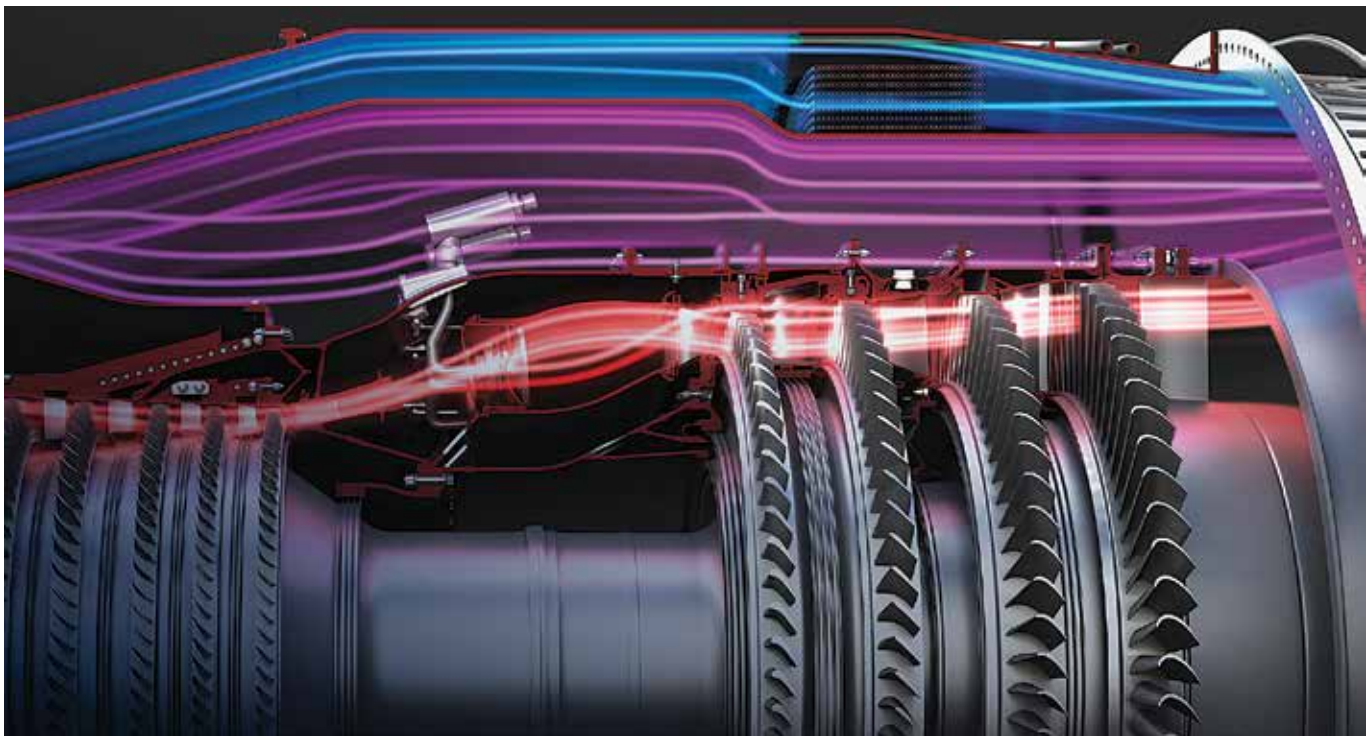
Pratt & Whitney is best known for the six variants that collectively form the GTF family. The GTF engine fans rotate much slower than the compressor and turbine, which gives them a 12:1 bypass ratio, which is the highest in the industry. The geared turbofan design results in "double-digit reductions in fuel efficiency, noise and emissions". Pratt & Whitney views the GTF's new designs with even higher bypass ratios as "the architecture of the future". The new GTF Advantage engine will be the most environmentally friendly option capable of even lower lifecycle emissions with sustainable aviation fuel (SAF). Successfully tested on 100 per cent SAF, GTF Advantage engines will be available soon.

Pratt & Whitney is also working on a hybrid-electric turboprop demonstrator on the De Havilland Canada's Dash 8-100. It is expected to begin flight tests in 2024. The regional market's will be the first to benefit from the lower-carbon technologies like all-electric, hybrid-electric and hydrogen-powered propulsion. The same will later percolate to larger aircraft. Also, advancements in turboprop technology could lead to a resurgence in this fuel-efficient design for regional aircraft. Turboprop engines use a propeller driven by a turbine engine, offering significantly lower fuel consumption compared to turbofans.

GE AVIATION

GE Aviation had its large turbofan GE90 engine that introduced the composite fan blades. The engine was also the first to use FAA-approved 3-D printed parts. The GE90 and newer technologies were ported to the GEnx, which is around 15 per cent more fuel-efficient. The GE9X is GE's latest engine and has the world record for the highest thrust, at 1,34,300 pounds. The reduced fan blade thickness improves aerodynamic efficiency, while its lower fan-radius-ratio maximises air-flow and minimises drag. Combined with fewer fan blades than many others, GE9X boasts the most efficient fan that increases performance and decreases fuel burn. GE9X incorporates more than 65 CMC components, the most of any commercial aircraft engine to date. These CMC components weigh a third of conventional parts, and yet are twice as strong for greater durability. Leveraging additive manufacturing,

PHOTOGRAPH: PRATT & WHITNEY



GE AVIATION'S REVOLUTIONARY ADAPTIVE CYCLE ENGINE (ACE) IS DESIGNED TO INCREASE COMBAT AIRCRAFT THRUST BY UP TO 20 PER CENT, IMPROVE FUEL CONSUMPTION BY 25 PER CENT AND EXTEND RANGE BY MORE THAN 30 PER CENT

GE9X combined more than 300 engine parts into just seven 3D printed components, resulting in less weight.

GE is also working on the MESTANG (More Electric Systems and Technologies for Aircraft in the Next Generation) technology. These other technologies include composite fan blades, heat resistant light metal alloys, advanced cooling methods and additive manufacturing.

ROLLS-ROYCE

Rolls-Royce has been famous for its high-bypass Trent turbofans that power many large airliners. Their forthcoming engines feature new architectures and innovative technological improvements to deliver 2-shaft and 3-shaft engine solutions for future aircraft applications. Rolls-Royce is working on building world's largest jet engine. Called the UltraFan demonstrator, the engine has the largest fan diameter ever of 140 inches. Its power gearbox has reached 87,000 horsepower, which is a new record. In the long run, the engine will have the potential to power very wide body jets.

PROPULSION TECHNOLOGY NEW APPROACH

The new engine technologies will involve engine-airframe integration, new and improved materials and material-processing techniques, advances in turbo-machine technology, progress in combustion technology and vastly improved utilisation of Computational Fluid Dynamics (CFD) in engine design procedures. The carbon-fibre blades allowed high-bypass jet engines that allowed developing efficient long-haul jets that could use just two engines rather than four. Novel technologies such as "smart engines" and the use of magnetic bearings will change the course of engine development. Additive manufacturing offers lighter, cheaper and quick-to-manufacture parts which will cut assembly costs and time, simplify maintenance and save on fuel.

GREENER ENGINE APPROACH

The future of aviation is likely to involve a shift towards cleaner fuels. Increased use of Sustainable Aviation Fuel (SAF) and even hydrogen are being explored to reduce the industry's environmental footprint. SAF is a biofuel derived from renewable sources like plant oils or waste feedstocks and can significantly reduce lifecycle carbon emissions compared to traditional jet fuel. Recently, Rolls-Royce publicly confirmed that it has successfully completed compatibility testing of 100 per cent Sustainable Aviation Fuel (SAF) on all its in-production civil aero engine types. This demonstrates that there are no engine technology barriers to the use of 100 per cent SAF and that the use of it does not affect engine performance.

Hydrogen, while still in early development for aviation use, holds immense promise as a clean-burning fuel that produces only water vapor as a byproduct. Challenges include onboard storage and infrastructure development, but companies like Airbus are already conducting research flights using hydrogen-powered engines.

Cutting emissions and noise abatement has been possible through technological innovations. Newer models of the most-widely used aircraft today not only carry more passengers, but also burn 23 per cent less fuel, through much better fuel burn efficiency. Lightweight low pressure turbofans using composite fan blades, high efficiency low pressure turbine, 3D-printed components, hybrid-electric systems, advanced heat-transfer circuits are other breakthrough technologies.

ELECTRIC AND HYBRID-ELECTRIC ENGINES

There is intense activity in the field of battery-driven electric aircraft. However, range is a huge limitation. One litre of lithium-ion battery pack stores 20 times less energy than one litre

PHOTOGRAPH: GE AVIATION

of jet fuel. Also, unlike jet fuel, the battery weight stays constant throughout the flight. Hybrid-electric aircraft are probably a more practical solution as they can achieve the best of both worlds. In a hybrid-electric configuration, the aircraft uses a combination of energy sources – jet fuel and electricity – either in tandem or alternately. This can optimise the overall energy efficiency and reduce fuel consumption.

GE has teamed up with NASA to test a megawatt-class, multi-kilovolt hybrid-electric propulsion system in simulated high-altitude conditions (up to 45,000 feet). The company will continue testing the system as part of NASA's Electrified Powertrain Flight Demonstration (EPFD) project. Under a European Union-funded project, the Sustainable Water-Injecting Turbofan Comprising Hybrid-Electrics (SWITCH), several agencies have got together to progress two key technologies – hybrid-electric and water-enhanced turbofan. They will use a Pratt & Whitney GTF engine and work towards combining the technologies for short and medium range aircraft. The Water-Injecting Turbofan (WET) uses residual heat from exhaust gasses to vaporize water and inject it into the combustor. As an integrated system of hybrid electric and WET technologies, SWITCH could achieve up to 25 per cent improvement in fuel efficiency, and sharply reduce CO_2 emissions compared to today's best engines. It will also enable an 80 per cent reduction in NOx emissions and significantly reduced contrail generation.

ATR AIRCRAFT HAVE DEMONSTRATED SUCCESSFUL FLIGHTS USING 100 PER CENT SUSTAINABLE AVIATION FUELS (SAF)

PHOTOGRAPH: ATR

HEAT RECOVERY CONCEPT

Two new engine concepts under investigation include the 'Combined Brayton Cycle Aero Engine' and 'Multi-Fuel Hybrid Engine'. Currently, over 50 per cent of the energy gets ejected as waste heat. A heat exchanger integrated in a turbofan core can convert recovered heat into useful power which can be used for on-board systems or to power an electrically driven fan to produce auxiliary thrust. A dual combustion chamber, wherein the high temperature generated in the first stage, allows ignition-less combustion in the inter stage, thus reducing CO and NOx emissions. Cryogenic bleed air cooling can enhance the engine's thermodynamic efficiency.

OTHER NEW INNOVATIONS

The US Department of Defense's Adaptive Versatile Engine Technology (a) and Adaptive Engine Technology Development (AETD) programmes, and the GE Adaptive Cycle Engine (ACE) are areas of action. Unlike traditional fixed airflow engines, the variable cycle engines automatically alternate between a high-thrust mode for maximum power and a high-efficiency mode for optimum fuel savings. Incorporating heat-resistant materials and additive manufactured components in the Pulse Detonation Engine (PDE), gives it the potential to radically increase thermal efficiency. These adaptive features also have additional stream of cooling air to improve fuel efficiency and dissipate aircraft heat load. Such engines will increase aircraft engine thrust by up to 20 per cent, improve fuel consumption by 25 per cent and extend range by more than 30 per cent.

CONCLUSION

New technologies will bring change, challenge and opportunity. Developing next-generation aero engines is a complex endeavour, involving the need to balance efficiency and noise, ensure reliability and safety, and manage high development costs. Increased efficiency is crucial, but reducing noise from next-gen engines, especially in urban areas, remains a significant concern, with open-fan architectures presenting specific noise challenges that need addressing. Rigorous testing and certification are necessary to ensure the highest levels of reliability and safety for passengers and crew. The research and development required for these advanced engines can be expensive, necessitating collaboration and investment from governments, airlines, and engine manufacturers. Despite these challenges, the potential benefits of next-generation aero engines are undeniable, promising to propel the aviation industry towards a more sustainable future with cleaner skies, reduced fuel consumption, and improved performance. These advancements will revolutionize air travel and play a crucial role in mitigating the environmental impact of aviation, leading to a future where air travel is faster, more efficient, cleaner, and more sustainable. SP

BUSINESS AVIATION IS EXPERIENCING A SIGNIFICANT UPTICK IN ACTIVITIES SINCE THE BEGINNING OF SECOND QUARTER OF 2024

NAVIGATING A TURBULENT SKY

According to WingX Advance data, the second quarter of 2024 showcased a resilient global business aviation industry, with significant regional variations and growth in key markets despite geopolitical tensions and fluctuating demands

By **AYUSHEE CHAUDHARY**

PHOTOGRAPH: PILATUS

THE EARLY MONTHS OF 2024 UNVEILED A LANDSCAPE marked by both continuity and shifts for the business aviation industry. While overall flight volumes maintained a striking similarity to the previous year, the nuances across regions and operator types revealed a multifaceted narrative of the industry's trajectory.

According to WingX Advance, in 2023, global flight activity had dropped by three per cent compared to 2022, aligning with market expectations following the post-pandemic slowdown. Globally, 5.1 million business jet and turboprop flights were recorded, at a 3.4 per cent compound annual growth rate over four years, with North America and Europe contributing 92

per cent of the activity. While business jet traffic decreased by four per cent compared to 2022, turboprop flights surged, particularly in South America and Africa, doubling since 2019. In December 2023, bizjet activity had dropped by three per cent from 2022 but remained 16 per cent higher than December 2019.

Beginning of 2024, global business aviation experienced a slowdown, with activity down four per cent compared to the previous year but still 16 per cent higher than January 2019

Q1 BIZJET ACTIVITY ROUNDUP

In January 2024, global business aviation experienced a slowdown, with activity down four per cent compared to the previous year but still 16 per cent higher than January 2019. Adverse weather in the US contributed to the decline, while Spain, Italy, and Turkey showed resilient demand. February saw a rebound in global business jet demand, especially in South America and Asia, while the US remained stable. February's bizjet activity increased by four per cent year-on-year. March 2024 maintained strong global business aviation activity, with the US market showing slight improvement compared to last March but still below the March 2022 peak. Overall, March activity was two per cent higher than last year and 36 per cent higher than March 2019, despite being three per cent lower than 2022. By Week 13, global bizjet activity saw a four per cent decline from the previous year, with 66,983 sectors flown, marking a nine per cent decrease from the previous week. In the US, Week 13 recorded 46,127 business jet sectors, a nine per cent drop from the previous week and four per cent lower than Week 13 in 2023. European business jet activity in Week 13 declined by 13 per cent from 2023 but maintained a one per cent lead over 2019, with Italy as the only standout performer. Meanwhile, the Middle East saw a three per cent decline, and China surged by 60 per cent year-on-year and 56 per cent compared to five years ago, emphasizing resilience amidst regional disparities. Despite these fluctuations, the Q1 activity was slightly ahead of last year and showed a 32 per cent increase compared to 2019, indicating a promising start to Q2.

The first quarter of 2024 presented a mixed picture for global business aviation, with fluctuations across regions and operator types. January saw a downturn in activity, but February and March showed a rebound with varying performance across markets. As the industry entered the second quarter, April indicated a promising uptick, particularly in the US. Despite challenges, the business aviation sector demonstrated resilience and adaptability, signaling potential for continued growth and recovery. Global bizjet activity in Q1 came out to be flat on last year, and -2 per cent as compared to 2022. However, Q2 appeared to be starting out on a better note.

Q2 BEGINS ON A STRONG NOTE

As the second quarter of 2024 began, the aviation industry experienced a significant uptick in activity, particularly in the business jet sector. Analysis by WingX revealed that April's performance was stronger across most major markets compared to the same period last year, except for some European countries where the charter market had weakened. The United States, in contrast, saw robust demand for large business jets, driving overall sector growth, despite a slight slowdown in charter demand with Part 135 flights declining by six per cent in week 16. From April 1st to 21st, global business jet sectors increased by four per cent compared to last year, although they were three per cent below April 2022 levels. Activity was notably 37 per cent higher than five years ago, indicating significant long-term growth.

In April, Cessna bizjets were the most active in the US in both flights and hours flown, with 4,711 unique aircraft being active in April, flying seven per cent fewer sectors than in April 2022. In contrast, Bombardier and Embraer business jets saw all time peaks in activity in the US. Embraer bizjets represented 13 per cent of all bizjet departures in the US in April, activity 11 per cent ahead of April last year, 76 per cent ahead of April 2019. New York was the largest metro area departure point for Embraer aircraft, Flexjet the largest operator in terms of flights flown.

In Europe, the business aviation landscape showed signs of softening, especially in Germany and France, where utilisation levels fell below 2019 levels. Conversely, the US market remained resilient, particularly among large fleet operators in the charter and fractional space. Globally, in Week 17 (April 22-28), business jet sectors totaled 71,000, down one per cent from the previous week but up four per cent compared to the same period in 2023. Scheduled flight activity surged by 19 per cent compared to 2023, while cargo operators recorded a six per cent increase from last year and a substantial 26 per cent jump from five years ago. In the US, 48,462 business jet sectors were flown during Week 17, with Teterboro as the busiest departure airport. European

JANUARY 1 - MARCH 31 ACTIVITY BY SECTOR, COMPARED TO PREVIOUS YEARS. (BUSINESS AVIATION = BUSINESS JETS ONLY)

Market Sector	Flights	vs 1Y ago: Flights	vs 2Y ago: Flights	vs 3Y ago: Flights	vs 4Y ago: Flights	vs 5Y ago: Fights
Scheduled Operation	71,39,784	16.8%	43.9%	91.3%	14.0%	8.5%
Other	9,38,276	27.2%	71.4%	117.2%	100.4%	122.7%
Business Aviation	8,58,273	0.3%	- 2.0%	29.3%	33.5%	32.2%
Cargo	2,69,295	- 1.5%	- 6.6%	- 3.5%	7.6%	24.3%
Grand Total	**92,05,628**	**15.4%**	**37.9%**	**80.3%**	**20.7%**	**17.0%**

Source: WingX

JUNE 1-9, 2024, ACTIVITY BY SECTOR
BUSINESS AVIATION = BUSINESS JETS ONLY

Market Sector	Flights	vs 1Y ago: Flights	vs 2Y ago: Flights	vs 3Y ago: Flights	vs 4Y ago: Flights	vs 5Y ago: Fights
Scheduled Operation	7,52,097	2.6%	32.2%	70.2%	424.4%	10.3%
Business Aviation	88,098	- 4.5%	- 7.0%	1.8%	91.1%	32.2%
Other	81,851	4.4%	87.3%	140.0%	653.6%	136.8%
Cargo	22,122	-11.3%	-15.4%	-14.1%	-4.6%	19.3%
Grand Total	**9,44,168**	**1.7%**	**28.7%**	**60.5%**	**322.3%**	**17.8%**

Source: WingX

business jet activity saw a three per cent decline compared to the same week in 2023, with notable decreases in France, Germany, and the UK. Despite fluctuations, trans-Atlantic bizjet activity remained resilient, showing a three per cent increase from last year and a 13 per cent surge compared to five years ago. In the Middle East, bizjet activity grew by 16 per cent from the previous week, signaling a positive trend despite challenges.

The second quarter of 2024 presented a dynamic landscape for global business aviation, marked by geopolitical tensions, fluctuating market demands, and significant events driving activity.

Geopolitical tensions in the Middle East led to a 20 per cent drop in bizjet demand in April. Despite this, global bizjet sectors from April 1-21 increased by 4 per cent year-on-year and 37 per cent from five years ago, though they were three per cent below April 2022 levels. In the Middle East, Week 16 bizjet activity was 11 per cent below last year but 14 per cent above the previous week. Year-to-date, Middle East activity is 8 per cent below 2023 but 46 per cent above 2019. While the region saw fluctuations, notable increases were reported in Bodrum and Doha by June.

In Europe, the bizjet market experienced mixed performance. The market remained stagnant at levels from five years ago in April. In May, activity declined, particularly in Germany and France, falling below 2019 levels. However, the D-Day anniversary in June boosted business jet arrivals in Normandy, France. Summer activity increased by three per cent from five years ago, although there were declines in arrivals from France and the UK at the start of Ibiza's party season. Events like the Champions League Finals and the upcoming Olympics in Paris are expected to drive peak traffic. Overall, Europe's bizjet activity was slightly down year-on-year but above 2019 levels.

The US market demonstrated resilience and growth. Bizjet activity increased by 15 per cent year-on-year during the Masters golf tournament in April. While there were fluctuations, overall trends remained strong. Early May activity was down four per cent year-on-year but 30 per cent ahead of May 2019. Las Vegas Harry Reid airport saw significant growth with almost 2,000 departures in May, up 16 per cent from the previous year. Despite a slow start to June, US bizjet activity significantly surpassed June 2019 levels. Fractional operators like Netjets and Flexjet saw significant growth throughout the quarter. By June, Dallas Love Field saw a six per cent increase compared to last year, while Chicago Midway experienced a decline.

Globally, bizjet activity experienced minor fluctuations but remained robust overall. In April, 72,000 global bizjet sectors were flown in Week 16, up two per cent from the previous week and four per cent year-on-year. Scheduled flights and cargo operations saw significant growth, contrasting with declines in Part 135 and 91K sectors. By June, 70,613 bizjet sectors were flown in Week 23, down one per cent from the same week in 2023, with Part 135 & 91K sectors falling by four per cent year-on-year. Despite these declines, global bizjet sectors were up 30 per cent from 2019.

China saw a remarkable 94 per cent year-on-year increase in bizjet activity in April, though the F1 Grand Prix had little impact on arrivals. The region continued to show growth into June, albeit with minor fluctuations. South America also saw positive trends, with bizjet flights from Sao Paolo up 15 per cent year-on-year by June.

The second quarter of 2024 highlighted the resilience and volatility of the global business aviation market, influenced by geopolitical events, seasonal factors, and major international gatherings. While some regions faced declines, overall activity remained strong, with significant growth in certain markets and aircraft categories.

> The second quarter of 2024 highlighted the resilience and volatility of the global business aviation market, and as the industry navigates through the rest of the year, these patterns of resilience and adaptability will likely continue to shape the trajectory of global business aviation

LOOKING AHEAD: RESILIENCE AND VOLATILITY

The second quarter of 2024 highlighted the resilience and volatility of the global business aviation market, influenced by geopolitical events, seasonal factors, and major international gatherings. While some regions faced declines, overall activity remained strong, with significant growth in certain markets and aircraft categories. As the industry navigates through the rest of the year, these patterns of resilience and adaptability will likely continue to shape the trajectory of global business aviation. SP

PIPER J-3 CUB: TRUSTED TRAINER

When the Civilian Pilot Training (CPT) programme was established in anticipation of US involvement in World War II, the Piper J-3 Cub was chosen as the primary training aircraft. Ultimately, 75 per cent of all CPT pilots trained on a Cub

THE PIPER J-3 CUB WAS AN AMERICAN LIGHT AIRCRAFT, originally designed as a trainer and sports plane. It turned out to be one of the most influential light aircraft ever manufactured. In fact, 85 years after it first appeared, it remains practically synonymous with general aviation in the United States. The qualities that contributed to its sterling reputation were its simple, lightweight design, good low-speed handling, and excellent short-field performance. Its affordability and popularity gave it the tag of "the Ford Model T of the air".

The Cub's ancestry goes back to the Taylor E-2 model manufactured by Taylor Aircraft Company in 1930. A few years following the E-2's introduction, it was redesigned as the Taylor J-2 Cub. In 1937, the company passed into the hands of William Piper and became the Piper Aircraft Corporation. The Piper J-3 Cub was introduced the same year.

The Cub was a high-wing, strut-braced monoplane with a large-area rectangular wing. Its fuselage was a welded steel frame covered in fabric, seating two people in tandem. Even for a light aircraft, the Cub was small. It was powered by a single Lycoming 65-hp engine, driving a fixed-pitch propeller. It cruised at approximately 112 km/h and had a maximum speed of 137 km/h with a ceiling of 2,800 m. The fuel tank held only 45.4 litres petrol, sufficient to cover a distance of 350 km. As compared to the J-2, the J-3 Cub had large, upholstered seating with more legroom, a less cluttered cabin and better controls. However, it had only the bare necessities to function as an aircraft – no electrical system, no flaps and no radio. That was the secret of its light weight and reliability. A unique feature was that due to the location of its centre of gravity it could be flown solo only from the rear seat. The pilot had to look out over the side of the cockpit at an angle best suited for executing a proper landing. While the take-off distance was 110 m, the landing distance was even shorter – just 80 m.

The plane's 1937 entry into service was very fortunate. When the Civilian Pilot Training (CPT) programme was established in anticipation of US involvement in World War II, the Piper J-3 Cub was chosen as the primary training aircraft. Ultimately, 75 per cent of all CPT pilots trained on a Cub. Sales took off correspondingly. In 1939, Piper produced around 1,300 J-3 Cubs and in 1940, over 3,000. Soon enough, a Cub was being built every 20 minutes. With the entry of America into the War, the US military also urgently required a large number of light aircraft for reconnaissance, observation and liaison duties. And the Cub came in handy, being small and agile, and allowing for quick movement even from semi-prepared grass strips. The Army purchased as many as 5,677 modified J-3 Cubs, commonly known as Grasshoppers. The striking yellow coat of the Cub was changed to olive green and Army J-3s were employed throughout the war. By war's end, 80 per cent of all US military pilots had received their initial flight training in Piper Cubs. First Lady Eleanor Roosevelt took a flight in a J-3 Cub, posing for a series of publicity photos to help promote the CPT programme. And media images of wartime leaders, such as Generals Dwight Eisenhower, George Patton and George Marshall, often showed them touring the battlefields of Europe in Piper Cubs.

After the War, Piper continued to build record numbers of new Cubs – one every 10 minutes – to meet the surging demand for affordable, light, general aviation aircraft. The plane was cannily priced within the reach of returning war veteran pilots who yearned to relive happy memories of flying their beloved Cubs. When production ended in 1947, 19,888 Piper Cubs had been built, and at least a couple of thousand aircraft are probably flying even today.

Finally, here are two interesting bits of trivia regarding the Piper J-3 Cub during wartime. First, on December 7, 1941, a student pilot, Marcus Poston was on a solo training flight in a Cub, just as the Japanese fighter planes reached Pearl Harbour. On being hit by Japanese fire, Poston kept his cool, bailed out, and parachuted to safety. The Cub thus became the first American plane to be shot down during World War II. The second notable episode happened following the Allied breakout in France when a few Piper Cubs (designated L-4 in US Army parlance) were equipped with improvised racks of infantry bazookas for ground attack against German armoured units. The most famous of these planes was "Rosie the Rocketer", piloted by Major Charles Carpenter. Its six bazooka rocket launchers were credited with eliminating six enemy tanks and several armoured cars during the War. No mean feat for a lightweight, trainer aircraft! SP

— JOSEPH NORONHA

MILITARY

MINISTER VISITS HAL

The Minister of State for Defence, Sanjay Seth visited HAL facilities and said the Company has a huge role to play in achieving 'Make in India' dream in Defence. The Minister assured HAL of the Government support and called upon the Company to ensure that various challenges on design and development, production and delivery fronts are addressed in time to contribute to achieve Viksit Bharat as envisaged by the Government.

EXERCISE PITCH BLACK 2024

An Indian Air Force (IAF) contingent landed at the Royal Australian Air Force (RAAF) Base Darwin, Australia for participating in Exercise Pitch Black 2024. The exercise is scheduled to be conducted from July 12 to August 2, 2024, and is a biennial, multi- national exercise hosted by the RAAF. This edition is slated to be the largest in the 43 year long history of Ex Pitch Black, which includes participation by 20 countries, with over 140 aircraft and 4,400 military personnel of various air forces. The exercise will be focusing on Large Force Employment warfare aimed at strengthening international cooperation and shall facilitate experience enhancement with the IAF Su-30 MKI operating alongside the F-35, F-22, F-18, F-15, Gripen and Typhoon fighter aircraft.

LANDMARK 350TH IDEX CONTRACT INKED

Innovations for Defence Excellence (iDEX), the flagship initiative of the Ministry of Defence, signed the landmark 350th contract in New Delhi on June 25, 2024. The contract was inked with SpacePixxel Technologies for the design and development of a 'Miniaturised satellite capable of carrying Electro-Optical, Infrared, Synthetic Aperture Radar, and Hyperspectral payloads up to 150 kgs'. This challenge is being led by the Indian Air Force. The 150th iDEX contract was signed in December 2022, and within a span of 18 months, the 350th contract has been signed.

ABHYAS' SUCCESSFULLY COMPLETES DEVELOPMENTAL TRIALS

Defence Research and Development Organisation (DRDO) has successfully completed six consecutive developmental trials of High Speed Expendable Aerial Target (HEAT) 'ABHYAS' with improved booster configuration. With this, ABHYAS has successfully completed 10 developmental trials demonstrating the reliability of the system.

The trials were carried out with improved Radar Cross Section, Visual and Infrared augmentation systems. During the trials, various mission objectives covering safe release of booster, launcher clearance, and endurance performance were successfully validated. Two launches were conducted back-to-back within a gap of 30 minutes, demonstrating the ease of operation with minimum logistics. Representatives from the Services witnessed the flight trials.

ABHYAS has been designed by DRDO's Aeronautical Development Establishment, Bengaluru, and developed through Production Agencies - Hindustan Aeronautics Limited & Larsen & Toubro. With identified production agencies, ABHYAS is now ready for production.

APPOINTMENTS

GULFSTREAM APPOINTS CHIEF SUSTAINABILITY OFFICER

Gulfstream Aerospace has appointed Smitha Hariharan as Vice President and Chief Sustainability Officer, effective immediately. In this newly created role, Hariharan will help to drive Gulfstream's sustainable transformation and stated industry goals by aligning its business strategies with sustainability principles while creating long-term value through impactful thought leadership.

ATR'S HEAD OF REGION AMERICAS

ATR has appointed Christopher Jones as the company's Head of Region Americas, effective July 1, 2024 and Managing Director & President ATR Americas, Inc., effective August 1, 2024. Christopher comes to ATR with over 30 years of commercial success in aircraft sales, and has held senior leadership positions with Airbus, Bombardier, and British Aerospace. As Head of Region Americas, Christopher will play a pivotal role in developing ATR in the region, especially in the US, and supporting the company's customers.

DUNCAN AVIATION'S MANAGER OF MRO RAPID RESPONSE TEAMS

Duncan Aviation is pleased to announce the appointment of Russ Haugen as the Manager of the company's MRO (Maintenance, Repair, and Overhaul) Airframe RRTs (Rapid Response Teams). These teams are based out of Duncan Aviation's MRO facilities in Battle Creek, Michigan; Lincoln, Nebraska; and Provo, Utah; and specialize in mobile response for airframe and engine AOG (Aircraft on Ground) and inspection services.

ADVANCING THE INDIAN AIR FORCE TRAINING CAPABILITIES

A NEW CHAPTER HAS BEEN INTRODUCED IN THE HISTORY OF the Indian Air Force (IAF) with the inauguration of the Weapon Systems School (WSS) by Air Chief Marshal V.R. Chaudhari, Chief of the Air Staff (CAS), at Air Force Station Begumpet, Hyderabad on July 1, 2024.

This follows the approval of a new branch of officers in the IAF, the Weapon System (WS) branch in 2022. This specialised branch will train operators of various ground-based and specialist weapon systems. With greater operational efficiency the WSS aims to foster and adopt a more cohesive approach to offensive strategies. The WSS is aimed at recalibrating and transforming the Indian Air Force as a future-oriented force.

According to the statement from the IAF, the formation of this new training establishment is a gigantic leap for the Armed Forces in general, and the IAF in particular. The addition of the WSS has been one of the key initiatives of Air Chief Marshal V.R. Chaudhari.

INAUGURATION OF THE WEAPON SYSTEM SCHOOL OF THE IAF BY CHIEF OF THE AIR STAFF

Air Vice Marshal Premkumar Krishnaswamy, Commandant, Weapon Systems School will spearhead the training with Air Marshal Nagesh Kapoor, Air Officer Commanding-in-Chief, Training Command.

The WSS will impart contemporary effect-based training and prepare officers of the newly formed branch in line with the requirements of the IAF. The new special branch will have four streams; Flying stream to operate the weapons and systems in airborne platforms like the Sukhoi-30 MKI and C-130J; Remote stream to operate Remotely Piloted Aircraft; Mission Commanders and operators for Surface to Air and Surface-to-Surface weapon systems, and Intelligence stream for handling space-based intelligence and imagery. Flight Cadets of the WS Branch will undergo their second semester of training at this institute.

During the interaction, the CAS highlighted that with the creation of the WS Branch, operators of ground-based and specialist weapon systems will come under one umbrella, enhancing the warfighting capabilities of the IAF significantly.

The objective and the purpose of the course are to train students to be tactical experts in their combat speciality while also learning the art of battle-space dominance and integration of joint assets. This integrated approach also aims to strengthen combat power in any domain of conflict. Using an integrated approach means that WSS graduates get extensively familiar with their respective mission design series, but are also trained in how all assets can be employed in concert to achieve synergistic effects.

The course aims to combine all assets in challenging scenarios, involving contemporary and future threats. According to a senior IAF official who commanded the multiple training programme for the fighter pilots explained that the WSS module demonstrates the ability to lead and instruct while effectively integrating multiple weapons systems across the land, air, space, and cyber domains. SP

— By Manish Kumar Jha

MoU TO SET UP TESTING FACILITIES IN UAS, EW & EO DOMAINS

Ministry of Defence (MoD) has signed an MoU to establish three state-of-the-art testing facilities in Chennai under the Tamil Nadu Defence Industrial Corridor - one each in Unmanned Aerial System (UAS), Electronic Warfare (EW) and Electro Optics (EO) domains. The MoU, under the Defence Testing Infrastructure Scheme (DTIS), was exchanged between senior officials of MoD and Tamil Nadu Industrial Development Corporation Limited in the presence of Defence Secretary Giridhar Aramane in New Delhi on July 2, 2024.

With an outlay of Rs 400 crore, the DTIS was launched by Defence Minister Rajnath Singh in May 2020 to set up state-of-the-art testing facilities in collaboration with private industry and Central/State Government, promoting indigenous defence production, reducing military equipment imports and enhancing self-reliance. To provide impetus to the defence and aerospace sectors within the Defence Industrial Corridors, seven testing facilities were approved - four in Tamil Nadu and three in Uttar Pradesh. The MoU for three facilities in Tamil Nadu has been signed now.

EMBRAER DELIVERS THE SECOND KC-390 MILLENNIUM

Embraer delivered the second KC-390 multi-mission aircraft to the Portuguese Air Force (FAP). The platform includes standard NATO (North Atlantic Treaty Organisation) equipment already integrated into the aircraft and meets the requirements set by the National Aeronautical Authority (AAN) of Portugal. In 2019, FAP ordered five KC-390, including a comprehensive services and support package and a flight simulator. The first aircraft entered into service in October 2023 at Beja Air Base.

The C-390 can carry more payload (26 tonnes) compared to other medium-sized military transport aircraft and flies faster (470 knots) and farther, being capable of performing a wide range of missions operating on temporary or unpaved runways. The aircraft configured with air-to-air refuelling equipment, with the designation KC-390, has already proven its aerial refuelling capacity both as a tanker and as a receiver.

CIVIL

GULFSTREAM COMPLETES SAVANNAH SERVICE CENTER EXPANSION

Gulfstream Aerospace announced the official opening of its expanded Customer Support service centre at Savannah/Hilton Head International Airport. Savannah Service Center East has added more than 200 new jobs and significantly expands Gulfstream's maintenance, repair and overhaul facility capabilities in the region.

"We continue to expand and enhance our service capabilities in support of the continued growth of Gulfstream's next-generation fleet including the recently certified G700," said Derek Zimmerman, President, Gulfstream Customer Support. "The Savannah Service Centre East expansion is part of our long-term strategic plan to create the industry's most modern and sustainable service network, while significantly enhancing access and convenience for our customers."

Gulfstream has invested more than $150 million in the 3,67,000-square-foot/34,000-square-meter facility located on the east side of the airport. The new building complements the main Savannah Service Centre by adding more hangar space, offices and back shops, all optimised for efficiency. This additional space allows Gulfstream to accommodate up to 26 more aircraft at any given time.

EMBRAER'S STRONG PRESENCE AT FARNBOROUGH AIRSHOW

Embraer will have a strong presence at the Farnborough International Airshow. At the event, Embraer will debut the brand-new E-Freighter, the E190F, marking its first public appearance. Embraer's lineup at the show highlights its leading portfolio of aircraft for commercial aviation and defence, which includes the E195-E2, the world's most efficient and quietest narrowbody; the E190F, an E-Jet cargo conversion that is making its debut at the show; the C-390 Millennium multi-mission military tactical transport; and the A-29 Super Tucano multi-role aircraft, the gold standard for a broad range of missions such as light attack, aerial surveillance and interception, and counterinsurgency. The C-390 Millennium and the E195-E2 will also take part in the flight display.

The E190F, which performed its maiden flight earlier this year, is a passenger jet converted to a freighter (E-Freighter). The E-Jets freighters (E190F and E195F) were launched in 2022 to meet the changing demands of e-commerce and modern trade, which require fast deliveries and decentralised operations.

SITA BECOMES LEADER IN AIRPORT SOLUTIONS

SITA, the global leader in technology solutions for the air transport industry, has completed the regulatory formalities and legal procedures to acquire Materna IPS. This strategic move will reshape the aviation industry, resulting in the world's most powerful passenger portfolio for airports and digital travel.

The acquisition represents an unprecedented acceleration of global aviation industry digitalisation, streamlining check-in, baggage handling, and security processes. Travelers can expect reduced wait times, smoother journeys, and a new era of personalized digital services.

This strategic move will see SITA become number one in terms of market share of solutions like self-bag drop while it strengthens its leadership of areas such as biometrics, with 85 per cent of international air passengers served globally, and in Common Use Terminal Equipment (CUTE) and Common Use Self Service (CUSS) kiosks. All this will strongly benefit the entire travel industry as it tackles pressing demands for increased terminal capacities and best-in-class secure solutions leading to easy travel for all passengers. It'll allow the industry to transform airports from simple transit hubs to digital, personalized experiences for travelers across the world.

BOEING TO ACQUIRE SPIRIT AEROSYSTEMS

Boeing announced it has entered into a definitive agreement to acquire Spirit AeroSystems. The merger is an all-stock transaction at an equity value of approximately $4.7 billion, or $37.25 per share. The total transaction value is approximately $8.3 billion, including Spirit's last reported net debt.

"We believe this deal is in the best interest of the flying public, our airline customers, the employees of Spirit and Boeing, our shareholders and the country more broadly," said Boeing President and CEO Dave Calhoun. "By reintegrating Spirit, we can fully align our commercial production systems, including our Safety and Quality Management Systems, and our workforce to the same priorities, incentives and outcomes – centred on safety and quality."

PRATT & WHITNEY EXPANDS INDIA OPERATIONS

New center will employ 150 aerospace experts and drive customer service and operations support

PRATT & WHITNEY, AN RTX BUSINESS, announced the establishment of its new Customer Service Center in Bengaluru. The new center will be part of Pratt & Whitney's India Capability Center (legal India entity UTCIPL) and will drive customer service and operations support for Pratt & Whitney Canada's 68,000 engines in service.

The facility is expected to employ more than 150 aerospace experts and engineers who will support a global customer service ecosystem. The center will be co-located with Pratt & Whitney's supply chain operations, engineering, and digital transformation centers of excellence in India.

"With the new Customer Service Center, we are leveraging our existing investments in India and using regional talent to augment our world-class product and service dependability and customer experience service level," said Nivine Kallab, Vice President, Customer Programs, Pratt & Whitney Canada.

Employees at the Customer Service Center will deliver a wide range of services such as maintenance, repair and operations (MRO) support, spare part management, engine leasing, engine reliability analysis and contract administration. The center's customers are expected to include Indian and global airlines, original equipment manufacturers, MROs, regulatory bodies and small operators.

"We have invested over $40 million in India across our centers and expanded our talent pool to over 600 employees within last three years. The Customer Service center will aim to enhance our worldwide service transformation and deliver operational excellence," adds Sandeep Sharma, director, India Capability Center, Pratt & Whitney (UTCIPL).

Pratt & Whitney Canada's turboprop engine families power majority of India's regional aviation fleet. Indian airlines like IndiGo, Alliance Air, Fly91 and SpiceJet operate over 90 ATR-72, ATR-42 and DHC-8-400 aircraft, powered by PW127, PW127XT and PW150 engines. The PW127G also powers Indian Air Force's C-295 aircraft while the PT6A powers its PC-7 trainers.

The PW100 engine family celebrates its 40th anniversary in 2024. This engine family is the benchmark for low fuel consumption on routes of 350 miles or less, consuming 25 per cent to 40 per cent less fuel and avoiding an equal measure of CO_2 emissions than similar-sized regional jets. SP

NDA 3.0 — BOOST DEFENCE ALLOCATIONS

With India already a $5 trillion economy and aiming for $7 trillion by 2030, an annual defence budget of 4-5 per cent of GDP is needed through the next decade

By LT GENERAL P.C. KATOCH (RETD)

THE NEW INDIAN GOVERNMENT LED BY PRIME MINISTER Narendra Modi has been sworn in on June 9, 2024. The Union Defence Minister, Home Minister, Foreign Minister and Finance minister remain unchanged.

Amid the prevailing geostrategic dynamics and the race for global domination, the threats to India are also rising. The China-Pakistan nexus is growing stronger and has extended into the maritime domain including China supplying submarines to Pakistan. Heads of States of some of India's immediate neighborhood attended the swearing in of the new government but many of them are being drawn further into China's strategic sphere; new Nepalese maps claiming Indian Territory and Maldives ordering review of Indian projects are just two examples.

It is important to study the War in Ukraine that has become a laboratory for high-end technological military applications. The potential strategic benefit of integrating AI with EW and cyber has the potential to reshape the landscape of future warfare. This is what we are likely to face in the next war with China. Similarly, the Israel-Hamas war has been witnessing Israel's AI-enabled bombings and the intricacies of the extensive tunnel warfare, both of which need to be studied. It would also be useful to examine how the Houthi have already shot down (kinetically or using EW?) six American MQ-9 Reaper drones, since we are also acquiring similar drones.

China has been increasing its activities in the Indian Ocean Region (IOR) and is upping the ante in the South China Sea. The establishment of an Information Support Force (ISF) is also significant. China's hectic pace of consolidation along the Line of Actual Control (LAC) and deployment of J-20 fighter aircraft, AWACS and air defence systems at Shigaste adjacent to the India-China-Bhutan junction indicates Beijing's aggressive designs. Consequently, we need credible capabilities vis-à-vis China in space, EW-AI-Cyber and an Indian version of 'Assassin's Mace' weapons including long-range vectors (rockets and missiles). The 'Rocket Force' must be speedily formed. In addition, we must also have tactical nuclear weapons (TNWs) and their delivery systems as part of our nuclear deterrence.

In the above backdrop, we urgently need a 'potent' national security strategy, the military security portion of which must include the nuclear, conventional, hybrid and unconventional aspects. Moreover, to establish credibility of any deterrence, we need to demonstrate it. Also, our military has equipment voids and continues to hold some obsolete equipment. The Indian Air Force is quite short of the authorised number of operational fighter squadrons. The Navy is grossly short of underwater capabilities. The number of SSBNs needs to be increased and minesweeping capability established. All these shortages need to be addressed holistically, not piecemeal.

The Theatre Commands (TCs) are work in progress. There appears to be a move to announce them soon. Obviously, the overall assets, including those of the IAF and Army's reserve formations, would be taken into account. At the same time, ramifications of grouping the Siachen-Kargil area with either the China-specific or Pakistan-specific TC needs to be carefully weighed.

Indigenisation of the defence sector should be top priority. We cannot afford to keep relying on imports. The focus should be towards "complete privatisation", as is the case in counties having modern militaries. The private sector including startups and MSMEs should be allowed to break the umbilical cord with the DRDO even after they come up with new innovations. Restructuring of the DRDO is underway but if it generally retains the same hierarchy, oversight and work culture then nothing much is likely to be gained; eventual privatisation should be examined.

The Agnipath system of Agniveers has unfortunately become a political issue and some tweaking is in the air, like increasing the percentage of absorption of Agniveers into the military. The system has serious implications in degrading the man behind the machine and in turn for national security. Moreover, Agniveer-equivalents in the Russian and Ukrainian forces have proved to be cannon fodder in the Ukraine War.

Taking these into account, defence allocations must be seriously addressed by the new NDA government, especially since economic power by itself does not make the nation a super power. Witness how much Japan, which does not even have a land border with China, has had to hike its defence budget in the last two years. With India already a $5 trillion economy and aimed at $7 trillion by 2030, an annual defence budget of 4-5 per cent of GDP is needed through the next decade if we want to catch up/overtake China. SP

PHOTOGRAPH: PIB

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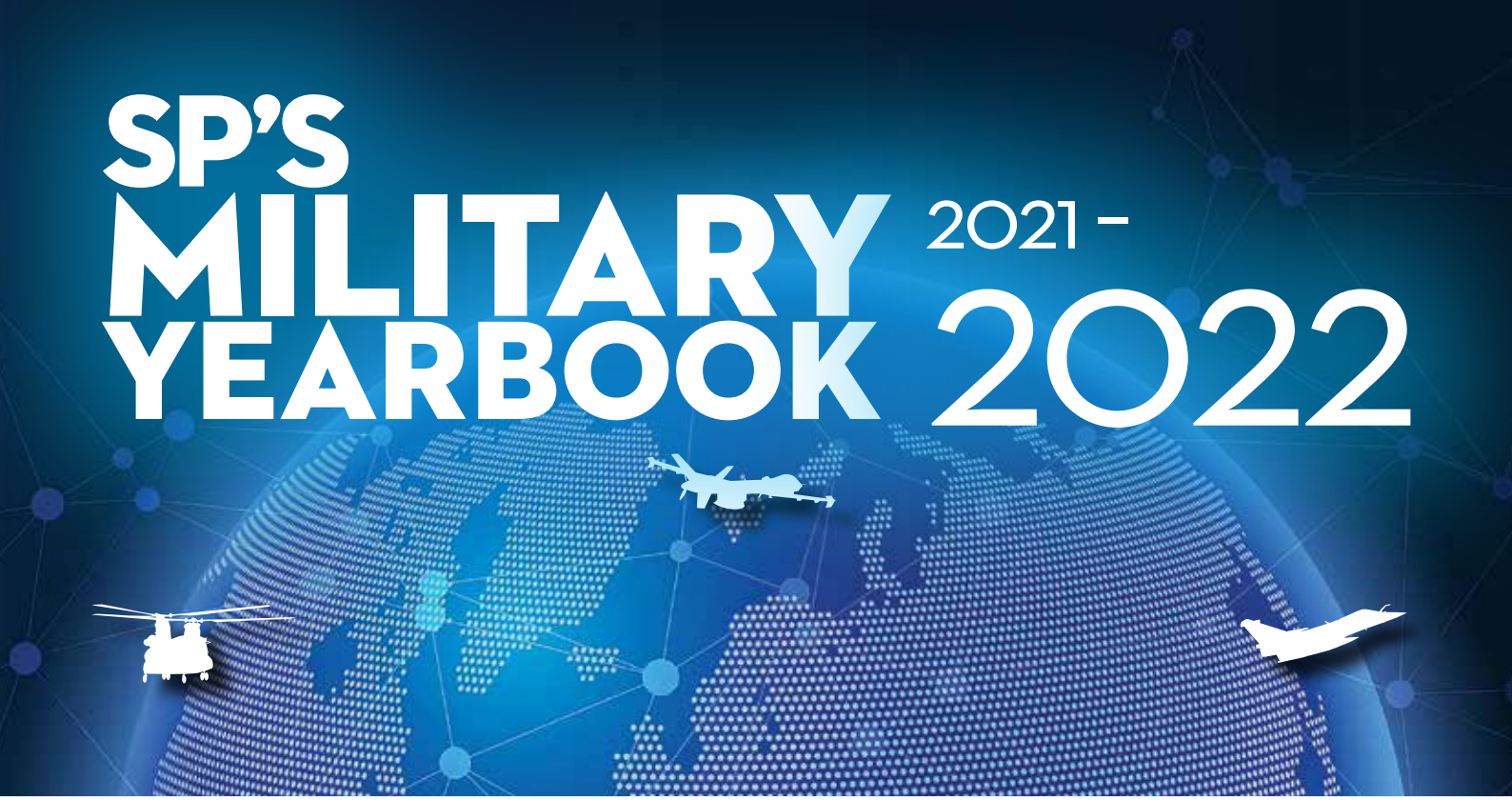

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