# AVIATION INSIGHTS

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***Ajeenkya DY Patil University***



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# "DECODING TOMORROW'S AVIATION. DELIVERING INSIGHTS THAT MOVE THE INDUSTRY FORWARD."



**Gp Capt Sundeep Mehta retd**
**Editor**

The third dimension has always excited the human mind and continues to draw its major attention ... always !

The pace of current development, explosive growth, breakneck innovation, coupled with the AI push have set such a dynamic and wide canvas to aviation Industry; from drones to space, from AI to robotics, to Nano technology, we are compelled and thrilled to bring to you stories of tomorrow with deep and balanced insights.

...Thus is born Aviation Insights. Catapulted into existence like a space-rocket launch!

Through our special interviews of the top innovators, thought leaders, policy makers, scientists, entrepreneurs and academicians, we bring to you the larger complete picture, as well as, the deep insights. Be they about Drones, eVTOL, Space, Avionics, Radars, Satellite Communications, MRO, Training or Simulation, by filling the gaps to make your understanding complete. We spoke to Prof Dr Sanjay Kumar, a visionary leader, highlighting how the ecosystem needs to match pace with the evolving technology by setting up multi-modal heliports and verti-ports. His futuristic VertiNet 2040, HeliNet-AI models. Mr Shekhar Sardessai is a brilliant founder & MD, Kineco Limited and Mr Pawan Ranga, the dynamic CEO & MD Rangson Aerospace, they highlight the sharp, swift and focused transformation that Indian tech companies are making to become globally competent. Not just technologically but in delivering high quality, adopting global best practices and efficient deliveries. Abhishek Mohanty of Supreme Industry gives us insight as to how packaging industry is seeing a transformative change. With high-tech electronics now widely and commonly used by the frontline troops, delivery through drones, terrain, temperature and environmental factors of delivery locations have transformed the earlier simplistic packaging industry into a highly specialised field. Dr M Suresh Kumar, Professor and HOD Aerospace & Aeronautical Engineering told us about the challenges of academia to make young capable innovators, with fire in their belly, in adequate numbers so that the private and start-up aerospace sector of Bharat gains enough muscle, in time, to meet the global challenges. But leading the charge has been Payal Gupta, Cofounder and Director BD, Teknotrove Systems, Her Simulation and Digital Twin based transformative training adaptation is a boon to the aviation ecosystem. An enabler to the high pace of growth for Aviation industry in India. Training and witnessing more than a decade of high growth period without any disruptions or any compromise on quality in a highly complex and sensitive operative environment from Tarmac and Aprons to specialised vehicles is indeed an astonishing feat.

Aviation Insights will keep deep diving into the domains that accelerate growth of aviation sector, speak to the torch bearers, innovators, policy makers as also with behind the scenes and the silent operators to keep the wind blowing under your wings. We hope you enjoy the insights we bring to you together with our Editorial Board: Captain Gurucharan Arora and Gp Capt E K Prasad, both accomplished aviation professionals with enviable credentials. More about them in the next issue.

We will love to hear from you. Wishing you a happy festive season ahead.

Happy Landings !

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Publisher
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Editor-in-Chief
Gp Capt Sundeep Mehta, retd.

Editorial Board
Gp Capt Krishna Prasad (Retd)
Isaac Satyavarapu
Captain Gurucharan Arora

Creative Head
Swati Sharma (Design Garage)

Photographer
Krishanth

Marketing
Gp Capt Sundeep Mehta, retd.
B 501, Jal Vayu Towers, Jhajra,
Dehradun, Uttrakhand 248007
+91 80762 30223
sundeep.mehta@aviationinsights.in

Finance & Administration
Karunandhi (Sr.Manager)
Md. Wajid Ali (Asst.Manager)

Editorial & Advertising Offices
Bharat Insights Media Group
B 501, Jal Vayu Towers, Jhajra,
Dehradun, Uttrakhand 248007

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# Collins Aerospace Launches ARINCDirect OpenAPI for Flight Operations Data

Collins Aerospace has introduced ARINCDirect OpenAPI, expanding its flight-support services with a capability that allows operators to integrate flight-planning, trip and performance data directly into their existing digital systems.

The interface is intended to reduce manual data entry and make operational information more readily available across the tools used by business aviation flight departments. Early adopters have already integrated the API into enterprise platforms, according to Collins Aerospace.



The company said the service is designed to provide secure access to flight-support information and help teams respond more efficiently as schedules and operating plans change. By connecting data across systems, operators can improve the flow of information used for planning and day-to-day decisions.

The launch reflects a wider industry move towards connected aviation software, in which interoperable data services help flight departments streamline workflows and maintain more timely operational awareness.

# DAE COMPLETES UNITED AIRLINES BOEING 737 MAX MANDATE



Dubai Aerospace Enterprise (DAE) has announced the completion of a mandate involving United Airlines' Boeing 737 MAX aircraft. The announcement marks the conclusion of the specified aircraft transaction or delivery commitment between the aviation services company and the airline.

DAE is a global aircraft leasing and aviation services business that works with airlines and other aviation customers. Completion of the mandate forms part of the ongoing activity in the aircraft leasing market, where operators use leasing arrangements to manage fleet requirements and aircraft availability.

The development involves United Airlines' 737 MAX fleet, part of Boeing's narrowbody family used on short- and medium-haul routes. Further transaction details were not included in the accessible source text reviewed for this rewrite.

The completion announcement underscores the role of aircraft lessors in supporting airline fleet planning and the delivery of commercial aircraft into service.



# FAA CERTIFIES BOEING 737-10, CLEARING PATH FOR DELIVERIES

The U.S. Federal Aviation Administration has certified Boeing's 737-10, the largest member of the 737 MAX family, clearing a key regulatory milestone ahead of planned customer deliveries. The approval completes certification of the 737 MAX family's largest variant.

The 737-10 is designed to carry up to 230 passengers in a maximum-seat configuration. Boeing highlights its single-aisle economics, commonality with other MAX aircraft and additional range compared with competing aircraft without auxiliary fuel tanks.

The aircraft also includes safety enhancements, including an improved angle-of-attack system that Boeing says will become standard across the 737 MAX family. Certification follows flight testing and regulatory reviews by the FAA.

The milestone allows Boeing to move towards deliveries and gives airlines another capacity option within the narrowbody market. The timing of individual customer deliveries will depend on production and airline preparations.



# BOEING LAUNCHES DATALINER AIRCRAFT DATA INTELLIGENCE PLATFORM

Boeing has introduced Dataliner, an AI-powered data intelligence platform designed to help airlines turn aviation data into fleet-wide insights for maintenance and operational decisions. The platform aims to connect information that may otherwise remain fragmented across individual aircraft and systems.

Developed in partnership with Microsoft, Dataliner uses Microsoft Azure AI Foundry and data technologies alongside Boeing's aircraft




and engineering expertise. It is designed to help airlines analyse fleet information and gain a broader view of aircraft performance and maintenance needs.

Boeing says airlines can keep data within their own environments and control what information they share, while accessing Boeing and industry intelligence through applications, APIs, analytics and AI-enabled tools.

The platform reflects the growing use of data analytics and AI in airline operations, where better visibility across a fleet can support more informed maintenance planning and operational decisions.

## Safran SkyNaute Navigation System Selected for Airbus A220




Safran Electronics & Defense's SkyNaute inertial navigation system is set to equip the Airbus A220, extending the technology's use from military platforms into commercial aviation. The system combines inertial navigation with satellite-navigation data to help maintain accurate aircraft positioning and trajectory information.

A key feature is its ability to continue providing reliable navigation when Global Navigation Satellite System signals are unavailable, jammed or spoofed. Such resilience is increasingly important as civil aviation faces disruptions to satellite-navigation signals in some regions.

SkyNaute uses Safran's hemispherical resonator gyroscope technology, designed to provide high accuracy in a compact package without mechanical parts subject to wear. The system has already been selected for military aircraft, helicopters and drones operated by several European armed forces.

Its selection for the A220 brings this dual-use navigation capability into commercial airline operations and adds another layer of resilience to aircraft navigation systems.

## CAE ADDS FOUR FULL-FLIGHT SIMULATORS TO AMERICAS TRAINING NETWORK

CAE has expanded its business aviation training capacity in the Americas with four additional full-flight simulators. Announced at the NBAA Business Aviation Convention & Exhibition, the additions are intended to improve access to pilot training on aircraft used by business aviation operators.

The new simulator capacity covers the Bombardier Global 6500, Embraer Praetor 600, Pilatus PC-24 and Cessna Citation CJ4. The additions align CAE's training network with customer demand and the aircraft types in service across the region.

CAE said the expansion is designed to help operators access training where they need it while supporting crew readiness and safe operations. Full-flight simulators allow pilots to practise procedures and respond to operational scenarios in a controlled training environment.

The investment strengthens CAE's regional offering as business aviation operators seek training capacity for a diverse fleet of business jets.



# AFRICA'S AIRPLANE FLEET WILL MORE THAN DOUBLE BY 2045

Africa's commercial aircraft fleet is projected to grow from 755 to 1,625 aircraft by 2045, according to Boeing's 2026 Commercial Market Outlook. The forecast reflects rising air travel demand supported by population growth, urbanisation, a growing middle class and improving infrastructure.

Boeing expects the region to receive nearly 1,200 new aircraft over the period, including about 870 single-aisle jets to support domestic and regional networks. Demand for widebody aircraft is also expected to more than double, while the freighter fleet could increase from 60 to 150 aircraft as logistics, e-commerce and high-value exports expand.

Passenger traffic within Africa is forecast to grow faster than the regional average as connections improve. Europe is expected to remain Africa's largest international passenger market through 2045.



The growth will also create demand for aviation services and skilled workers. Boeing forecasts a $140 billion market for maintenance, repair, overhaul and modifications, and estimates the region will need 75,000 additional aviation professionals, including pilots, technicians and cabin crew.

# BermudAir Becomes Second Global Operator of Embraer E190F Freighter




BermudAir has become the second airline worldwide to operate the Embraer E190F freighter, following an arrangement with aircraft lessor Regional One. The aircraft will be the first E-Freighter deployed in the Americas.

BermudAir will use the converted E190F to add cargo services to its passenger network, which currently connects ten destinations across the Caribbean, the United States and Canada. The airline operates two E175s and two E190s.

The new freighter is intended to support express shipments, local businesses, e-commerce and time-sensitive freight across the islands and North American markets served by BermudAir. The move adds a cargo business to the carrier's existing regional operations.

Regional One has placed five firm orders for the E190F programme, with two converted aircraft already delivered and in service. Embraer says the E190F is designed to address regional cargo needs by combining payload, cargo volume, range and operating efficiency.

# EMBRAER DELIVERS ITS 2,000TH E-JET TO AZUL

Embraer has delivered its 2,000th E-Jet, marking a major milestone for the commercial aircraft family that entered service in 2004. The milestone aircraft, an E195-E2, was handed over to Azul Linhas Aéreas, Brazil's largest airline by number of destinations served.

The E-Jet family has become a key platform for regional and short- to medium-haul connectivity. Across more than two decades, the aircraft have served over 90 airlines in more than 60 countries, accumulating approximately 48 million flight hours and carrying more than 2.85 billion passengers, according to Embraer.

Azul has been a major operator of Embraer aircraft since launching services in 2008. The airline has operated more than 140 E-Jets and was the launch customer for the E195-E2, receiving its first aircraft in 2019.

The delivery also marks Azul's 50th E2 aircraft, highlighting the long-running relationship between the manufacturer and the Brazilian carrier.



# KOREAN AIR TO INTRODUCE COMPLIMENTARY STARLINK WI-FI ON SELECT FLIGHTS

Korean Air plans to begin offering complimentary high-speed in-flight Wi-Fi powered by Starlink on selected flights from September 15. The service will allow passengers to browse the internet, stream content and use cloud-based applications during their journey.

The initial rollout will cover four retrofitted widebody aircraft: three Airbus A350-900s and one Boeing 777-300ER. These aircraft are expected to operate medium- and long-haul routes across the Americas,



Europe and Southeast Asia, as well as selected shorter routes.

Korean Air intends to expand Starlink connectivity across its in-service fleet by the end of 2027. Voice and video calls will remain restricted to maintain cabin comfort. Aircraft awaiting retrofit will continue to offer the airline's existing paid Wi-Fi service during the transition. The introduction positions Korean Air among the early full-service carriers in East Asia adopting low-Earth-orbit satellite connectivity for passenger broadband.

## ANA HOLDINGS ADDS EIGHT EMBRAER E190-E2 AIRCRAFT TO ORDER




ANA Holdings has signed an agreement with Embraer for eight additional E190-E2 aircraft, formalising a decision announced in July 2026. The order builds on a 2025 contract for 15 aircraft and brings ANA Holdings' firm E2 orders to 23, with options for five more E190-E2s.

The additional aircraft are intended to support the development of Japan's regional aviation network. ANA Holdings says the E190-E2's fuel efficiency and operating economics will help manage costs and environmental impact while improving connections between cities.

Embraer says the aircraft's efficiency, cabin space and passenger comfort make it suitable for expanding regional services. The order deepens the manufacturer's relationship with ANA Holdings as the group plans its future fleet and regional connectivity.

The E190-E2 is part of Embraer's E2 family of next-generation narrowbody aircraft, designed for airlines seeking capacity and efficiency on regional routes.

## Ethiopian Airlines Orders 10 Boeing Freighters to Expand Cargo Fleet

Ethiopian Airlines has ordered eight Boeing 777-8 Freighters and two 777 Freighters to increase cargo capacity and support its growing international network. The order makes Ethiopian Airlines the first African carrier to purchase the next-generation 777-8 Freighter.

The aircraft will complement the airline's existing freighter fleet, which serves more than 70 cargo markets across Africa, Asia, Europe, the Middle East and North America. Ethiopian Airlines currently operates 777 and 767 freighters as well as converted 737-800 cargo aircraft.

Boeing says the 777-8 Freighter is designed to combine long range with high payload capability and improved operating efficiency. With a maximum structural payload of 118 tonnes, the aircraft is intended to help airlines serve additional markets and move large or heavy cargo.

The order also extends Ethiopian Airlines' commitment to Boeing's 777X family, following its earlier order for 777-9 passenger aircraft. The new freighters are expected to strengthen the airline's role as a cargo gateway between Africa and global markets.



# CDB AVIATION DELIVERS FIRST BOEING 737-8 TO NORWEGIAN

CDB Aviation has delivered the first of four Boeing 737-8 aircraft to Norwegian, marking the lessor's first aircraft lease to the airline. The aircraft are covered by lease agreements signed by the companies in December 2024.

The delivery supports Norwegian's fleet-renewal strategy, which focuses on modernising its aircraft with more fuel-efficient models. The remaining three 737-8 aircraft are part of the same arrangement and are expected to contribute to the airline's fleet plans.

CDB Aviation, an Irish subsidiary of China Development Bank Financial Leasing, said the aircraft would help improve operational efficiency and provide financial flexibility for the carrier. Norwegian described the delivery as an important step in its fleet renewal and welcomed the new relationship with the lessor.



The Boeing 737-8 is part of the 737 MAX family and is designed for short- and medium-haul services. The lease arrangement reflects the role of aircraft lessors in helping airlines renew fleets while managing capital commitments.

# BIMAN BANGLADESH AIRLINES ORDERS 11 MORE BOEING 787 AND 737 MAX JETS




Biman Bangladesh Airlines has placed an additional order for 11 Boeing aircraft, comprising five 787-10 Dreamliners and six 737-8 jets. The purchase follows the airline's earlier order for 14 787 Dreamliner and 737 MAX aircraft and supports its fleet-renewal and network-expansion plans. Biman operates 787, 777 and 737 Next-Generation aircraft across its international network, linking Bangladesh with major hubs in the Middle East, South and Southeast Asia, and Europe. The new aircraft are intended to provide additional capacity and improve operating efficiency as the airline develops its route network. Boeing says the 787 Dreamliner and 737 MAX families can deliver 20–25% better fuel efficiency than the aircraft they replace. The order was announced alongside government representatives from Bangladesh and the United States. Biman said the purchase forms part of a broader plan to strengthen international connectivity for travellers, businesses, tourism and the Bangladeshi diaspora.

# AIR CAIRO ORDERS 15 AIRBUS A320NEO AIRCRAFT FOR EXPANSION

Air Cairo has signed a firm order for 15 Airbus A320neo aircraft, announced at the El Alamein International Airshow 2026. The deal marks the airline's move to add directly owned aircraft alongside its leased Airbus fleet as it plans further growth.

Air Cairo's fleet has expanded from seven aircraft five years ago to more than 45 today. The airline aims to operate over 130 aircraft by 2034, using the A320neo order to support domestic, regional and international network development.

The A320neo is designed to provide improved fuel efficiency and operating economics for single-aisle operations. Air Cairo said combining owned aircraft with leased aircraft would provide greater operational flexibility as it responds to travel demand and supports Egypt's tourism sector.

The agreement represents the airline's first direct acquisition of Airbus aircraft and reinforces its partnership with the manufacturer as it prepares for its next stage of expansion.



# EMBRAER AND MAHINDRA IDENTIFY NAGPUR FOR POTENTIAL C-390 ASSEMBLY FACILITY

Embraer and Mahindra Group have identified Nagpur, Maharashtra, as a potential location for a final assembly line for the C-390 Millennium military transport aircraft in India. The proposal remains conditional on the aircraft being selected for the Indian Air Force's Medium Transport Aircraft programme and a subsequent order being placed.

The companies are working with the Maharashtra government on preparations for a possible industrial and support ecosystem.



If the programme proceeds, the facility could support local assembly, systems integration, manufacturing engineering and development of an Indian supply chain.

The partnership is also considering maintenance, repair and overhaul, training and lifecycle support capabilities. The initiative builds on cooperation agreements between Embraer and Mahindra aimed at advancing the C-390 for India's transport-aircraft requirement. The C-390 is a multi-mission aircraft designed for troop and cargo transport, airdrop, medical evacuation, search and rescue, firefighting and humanitarian operations. No final assembly programme has been confirmed; progress depends on the Indian government's procurement decision.

## KLM Receives Its First Airbus A350-900 for Long-Haul Fleet Renewal




KLM Royal Dutch Airlines has taken delivery of its first Airbus A350-900, marking a step in the carrier's long-haul fleet renewal. The aircraft is expected to operate international services from the airline's hub at Amsterdam Airport Schiphol, including routes such as Toronto.

Configured for 331 passengers, the aircraft features 34 Business Class suites, 26 Premium Comfort seats and 271 Economy seats. Its Airspace cabin includes larger luggage compartments, ambient lighting and high-speed satellite connectivity, with design features intended to improve comfort for passengers and crew.

The A350-900 will join KLM's existing Airbus fleet, which includes A330-family aircraft and A321neo jets. Introducing the next-generation widebody is intended to support the airline's long-distance network while renewing its aircraft fleet.

The delivery adds another operator to the A350 family and gives KLM a modern widebody platform for serving key international markets.

## Biman Bangladesh Airlines Orders 10 Airbus Aircraft for Fleet Modernisation

Biman Bangladesh Airlines has placed a firm order for 10 Airbus aircraft, comprising four A350-900 widebodies and six A321neo single-aisle jets. The order supports the Bangladeshi flag carrier's fleet modernisation plans and its ambition to expand international services.

Operating from Dhaka, Biman expects the aircraft to help strengthen connections to destinations in North America, Europe and the Middle East. The A350-900 is designed for long-haul operations, while the A321neo can serve regional and longer, thinner routes with the economics of a single-aisle aircraft.

Airbus has pointed to Bangladesh's growing travel demand, overseas diaspora and expanding trade as factors supporting the country's aviation market. Cargo demand is also expected to benefit from increased international commerce.

The order represents a significant addition to Biman's fleet plans, giving the airline a mix of widebody and narrowbody aircraft to serve different route requirements.



# VIETJET EXPANDS COLLINS AEROSPACE SUPPORT CONTRACT FOR 44 ADDITIONAL AIRCRAFT




Collins Aerospace has expanded its agreement with Vietjet Air to provide FlightSense technical and maintenance support for an additional 44 GTF-powered Airbus A320neo-family aircraft. The contract extension is intended to help the Vietnamese airline improve fleet reliability and make maintenance planning more predictable.

FlightSense provides component support designed to improve availability and reduce aircraft downtime, while helping operators manage maintenance costs. Collins Aerospace said the service will use data from Vietjet's A320neo and A321XLR aircraft to anticipate maintenance requirements and support operational reliability.

Vietjet said the expanded arrangement would strengthen its engineering and operational processes as it develops its fleet and network. The agreement adds to the technical support available for the airline's growing narrowbody operations.

The contract reflects the role of aftermarket services and data-informed maintenance in supporting airline fleet expansion and keeping aircraft available for scheduled operations.

# AVOLON ORDERS 110 AIRBUS AIRCRAFT TO SUPPORT AIRLINE FLEET DEMAND



Aircraft lessor Avolon has placed a firm order for 110 Airbus aircraft: 35 A330-900 widebodies and 75 A320neo-family aircraft. The transaction expands the lessor's order book and strengthens its pipeline of new aircraft for airline customers.

Following the agreement, Avolon's total orders for the A330-900 will reach 114 aircraft, while its cumulative A320-family orders will rise to approximately 650. The company said the investment reflects continued demand for new aircraft as airlines plan fleet growth and replace older aircraft over the coming decade.

The A330-900 serves long-haul markets, while the A320neo family is designed for single-aisle operations across a broad range of routes. Having both types in its portfolio gives Avolon options to meet different airline capacity and network requirements. The order further deepens Avolon's longstanding relationship with Airbus and adds to the global leasing sector's role in financing airline fleet renewal.



# AVIATION CAPITAL GROUP PLACES RECORD ORDER FOR 75 AIRBUS A320NEO JETS

Aviation Capital Group (ACG) has signed a firm order for 75 Airbus A320neo-family aircraft, marking the largest order in the aircraft lessor's nearly 40-year history. The agreement raises ACG's total historical orders for the type to 190 aircraft.

Headquartered in Newport Beach, California, ACG said its portfolio strategy prioritises new-technology narrowbody aircraft that are in demand among airlines worldwide. The order is intended to support customer requirements for fleet expansion and replacement well into the next decade.

Airbus describes the A320neo family as a modern single-aisle range offering operating efficiency and flexibility for airlines. The aircraft are widely suited to short- and medium-haul routes, making them an important option for carriers managing capacity and operating costs.

The deal builds on the companies' relationship, which began with ACG's first Airbus order in 2007, and reinforces expectations for continued demand for fuel-efficient narrowbody aircraft.



# BEYOND PACKAGING:
## PROTECTING INDIA'S DEFENCE CAPABILITIES

***As India expands its indigenous defence manufacturing capabilities, protective packaging is becoming an increasingly important part of the defence supply chain. Advanced military equipment must withstand transportation, storage and challenging environmental conditions while remaining ready for deployment. Abhishek Mohanty, Head – Defence Business at Supreme Industries Ltd., discusses the growing importance of engineered packaging, emerging technologies, sustainability and opportunities for Indian manufacturers.***




## Abhishek Mohanty

**Head – Defence Business, Supreme Industries Ltd., in conversation with Sundeep Mehta, Editor, Aviation Insights**


**Q** **Protective packaging is often viewed as a secondary element in the defence supply chain. Why is it becoming increasingly important?**

**A** Protective packaging is much more than a transportation requirement in defence. It ensures that critical equipment reaches the end user in the same condition in which it left the manufacturing facility, ready for deployment.

At Supreme Industries, we develop customized, foam-based and engineered packaging solutions to protect military equipment, ammunition components, electronics and other critical assets against shock, vibration, moisture, dust and electrostatic discharge (ESD).

Our solutions include custom-moulded foam




inserts, protective buffers, transit cases and specialized packaging systems. We also provide ESD-safe packaging for sensitive applications and work with defence establishments, including projects associated with ARDE/DRDO and ordnance factories.

Every application requires a different approach. Equipment sensitivity, transportation modes, climatic exposure, handling conditions and storage duration must be considered during design. Our objective is to deliver reliable protection throughout the equipment's journey and ensure that it remains ready for operational use.

**Q** **Modern defence platforms incorporate increasingly sophisticated electronics and technologies. What are the major challenges in protecting these systems?**

**A** The growing sophistication of defence equipment has made packaging requirements considerably more demanding. One major challenge is mechanical stress. Equipment may travel by road, rail, air and sea, experiencing different levels of shock, vibration and impact. Even minor damage to sensitive components can affect performance and mission readiness.

*"We see this as an opportunity to support indigenous defence manufacturing through customized protective solutions."*

Environmental exposure is another concern. Equipment may be stored in deserts, coastal areas, high-altitude locations or extremely cold environments. Humidity, salt-laden air, dust and temperature fluctuations can compromise equipment if it is not adequately protected.

The growing use of electronic systems also makes ESD protection increasingly important. In addition, defence assets may remain in storage for extended periods while still needing to be operational at short notice.

Packaging must therefore provide suitable protection against mechanical and environmental risks while remaining durable, lightweight, reusable and cost-effective. Testing and close coordination with customers are essential to developing solutions that meet these requirements.

**Q** **How is indigenous defence manufacturing creating opportunities for packaging suppliers?**

**A** The expansion of domestic defence manufacturing under the Atmanirbhar Bharat initiative has created significant opportunities for Indian packaging companies.

India is manufacturing increasingly sophisticated defence products, including missiles, radars, electronic warfare systems, communication equipment, unmanned systems, armoured vehicle components and aerospace assemblies. These assets require specialized protection throughout manufacturing, testing, transportation, storage and deployment.

Defence organizations and original equipment manufacturers are increasingly recognizing that




packaging is integral to product integrity rather than simply a logistics expense. This creates opportunities for domestic suppliers to develop application-specific solutions that meet stringent requirements while reducing dependence on imported packaging systems.

The growth of defence exports adds another dimension. As Indian equipment reaches international markets, packaging must meet the relevant transportation, handling and storage requirements of global supply chains.

At Supreme Industries, we see this as an opportunity to support indigenous defence manufacturing through customized protective solutions. By safeguarding equipment throughout its lifecycle, packaging suppliers can contribute to the reliability and operational readiness of India's defence systems.

**Q Which innovations are shaping defence packaging?**

**A** Innovation is centred on advanced materials, customized design and lifecycle performance. Engineered foam-based packaging, including specialized inserts and transit cases, can provide shock and vibration protection for electronics, communication systems, aerospace components and other mission-critical equipment.

ESD-safe and anti-static solutions are also becoming increasingly important as defence platforms incorporate more electronic and electromechanical systems.

Reusable transit packaging represents another significant development. These systems can withstand multiple transportation cycles, helping reduce packaging waste and lifecycle costs while maintaining consistent protection.

Manufacturers are also developing solutions to protect against moisture, corrosion, dust and harsh environmental conditions, particularly for equipment requiring extended storage.

Digital manufacturing tools and advanced material engineering support the development of packaging tailored to specific applications. This allows manufacturers to optimize material use, simplify handling and improve transportation and storage efficiency.

The industry's direction is clear: packaging must deliver dependable protection and long-term value, rather than simply meet immediate transportation requirements.

**Q How can sustainability be balanced with defence performance requirements?**

**A** Sustainability is becoming an important consideration across the defence supply chain, but it cannot compromise the protection and reliability required for military equipment.

Defence assets often operate in demanding environments and require packaging that withstands shock, vibration, moisture, corrosion and temperature extremes. Sustainable solutions must therefore satisfy the technical requirements of each application.

Reusable and returnable packaging systems are one practical approach. Where suitable, they reduce waste by allowing packaging to be used repeatedly while maintaining protection.

Material optimization and lightweight engineering can also reduce resource consumption without compromising structural integrity. Recyclable materials and circular-economy practices can be adopted wherever application requirements permit.

Lifecycle thinking is equally important.

Durable packaging that remains effective over multiple uses can reduce replacement frequency, resource consumption and logistics expenditure.

At Supreme Industries, we believe sustainability and performance can complement each other through thoughtful engineering. The objective is to integrate environmental responsibility into packaging design while maintaining the reliability required by defence customers.

**Q How does packaging contribute to equipment longevity and operational readiness?**

**A** Protective packaging supports equipment preservation at every stage, from manufacturing and transportation to storage, deployment and refurbishment.

Defence equipment frequently passes through multiple handling and transportation stages before reaching its final user. Effective packaging reduces exposure to impact, vibration, moisture, dust, corrosion and other environmental stresses.

Preventing damage at the source can reduce unnecessary inspections, repairs and component replacements. This is particularly important for high-value electronics, communication systems, aerospace components and precision-engineered assemblies.

Packaging also helps preserve equipment during long-term storage. Defence assets are expected to remain serviceable for extended periods, and appropriate protective systems help maintain their structural integrity and functional performance.

From a lifecycle perspective, packaging connects manufacturing, storage, transportation, deployment and maintenance. Well-designed solutions help maintain equipment condition throughout this journey, supporting availability and reducing avoidable costs.

We therefore view protective packaging as a strategic enabler rather than a supporting accessory. Its value lies in protecting critical assets, improving readiness and helping defence organizations maximize the service life of their equipment.

**Q What differentiates Supreme Industries when defence customers select packaging suppliers?**

**A** Defence customers evaluate suppliers on reliability, flexibility, customization, technical support and long-term value, rather than price alone.

Our approach emphasizes customer-specific engineering. Defence programmes may involve development projects, specialized low-volume requirements or larger production programmes. We aim to accommodate different requirements while maintaining consistent quality and performance.

Customization is particularly important because packaging must be designed around the equipment being protected. We work closely with customers, defence laboratories and system integrators to understand operational requirements, transportation conditions, storage environments and lifecycle expectations.

We also focus on total cost of ownership. A well-engineered packaging solution can help reduce transit damage, maintenance expenditure, replacement costs and downtime. Its overall value therefore extends beyond the initial purchase price.

Our domestic manufacturing presence and material expertise support responsive supply and technical collaboration. We aim to act as a technology and protection partner, developing solutions that improve asset protection, logistics efficiency and operational readiness.

**Q What trends will shape the future of defence packaging?**

**A** The industry will increasingly be influenced by advanced military technologies, evolving logistics requirements and the expansion of indigenous manufacturing.

Electronics-intensive systems, including radars, communication equipment, electronic warfare systems and unmanned platforms, will require packaging with enhanced protection against shock, vibration, ESD and environmental stresses.

Lifecycle management will also become more important. Defence organizations need packaging that supports not only transportation but also long-term storage, maintenance, refurbishment and redeployment. This creates opportunities for reusable systems and integrated asset-preservation solutions.

India's defence manufacturing initiatives and expanding exports will further increase the need for packaging that meets international supply-chain requirements. Sustainability will remain another priority, encouraging innovation in reusable, recyclable and resource-efficient designs.

At Supreme Industries, our focus is on engineering capabilities, material expertise, product innovation and customer-oriented solutions. We are also strengthening collaboration with defence OEMs, system integrators, research organizations and government stakeholders to understand emerging requirements.

India's expanding defence ecosystem presents a significant opportunity for domestic suppliers. By combining manufacturing capabilities with application-specific engineering, the industry can improve equipment protection and support India's broader defence modernization ambitions.

### Closing perspective

**As India's defence manufacturing sector grows in sophistication and international reach, protective packaging will play an increasingly strategic role. Its contribution extends beyond transportation to equipment preservation, lifecycle efficiency and operational readiness. Delivering customized, reliable and sustainable solutions will be essential to supporting the next phase of India's defence manufacturing journey.**

# BUILDING INDIA'S GLOBAL AEROSPACE COMPOSITES CAPABILITY

## KINECO'S JOURNEY AND VISION

*An exclusive conversation with Sundeep Mehta, Editor, on Kineco's aerospace composites journey, India's growing role in global aerospace manufacturing, and the company's vision for advanced composites across aviation, defence, autonomous systems and space.*

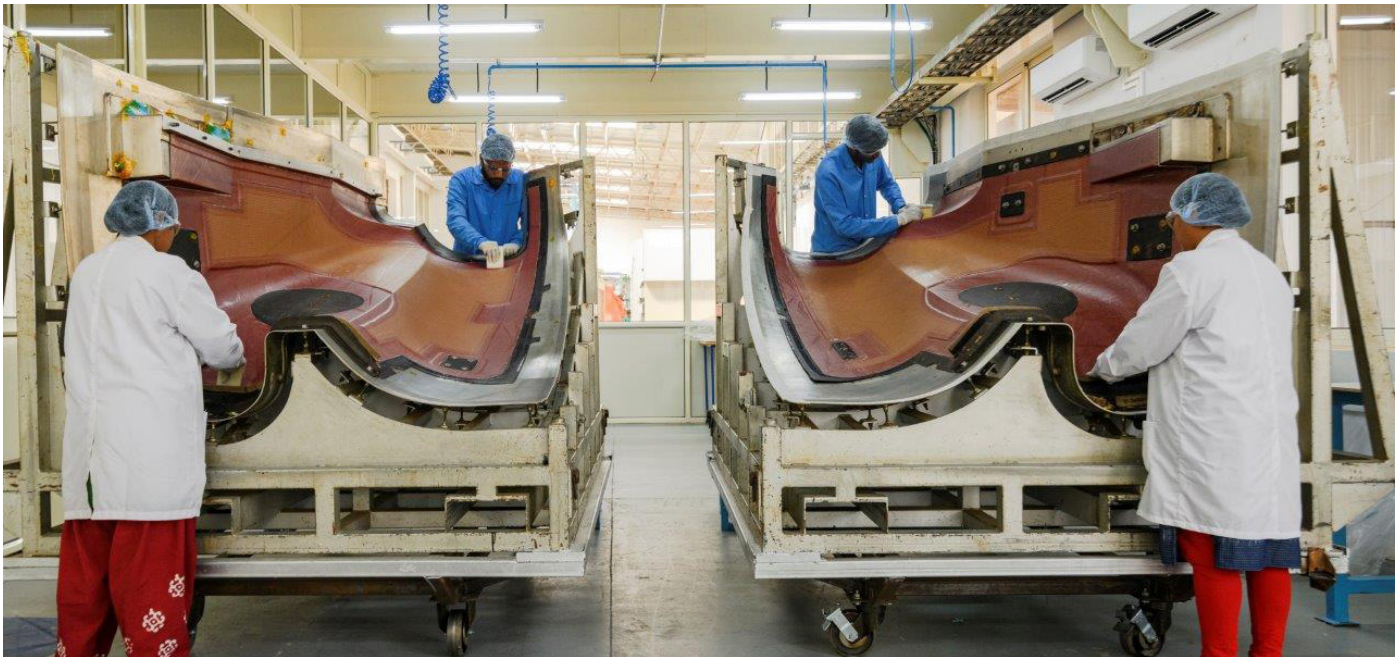


**Shekhar Sardessai**

**Founder & Managing Director – Kineco Limited.**

**Q** **Kineco has evolved from a composites manufacturer into a global aerospace supplier. What have been the key milestones in this journey, and how has the company's aerospace business evolved?**

**A** Kineco's aerospace journey has been one of progressive capability building. We entered into the aerospace domain in 2009-10, initially focused on manufacturing of Composite Tools for HAL for their Helicopters. Then came the real push in the aerospace business vertical when we carved out our Advanced Composites Division and converted into a JV with Kaman Aerospace Group in 2012 and won our first of many aerospace businesses from BAE Systems for the supply of Mission Crew Workstations for the Boeing P-8 Poseidon Aircrafts. On the back of this flagship work package which is still continuing strong after 14 years, over the years



*"The real opportunity is to establish India as a strategic aerospace manufacturing and engineering base that can support global programmes over decades."*

we have built the Infrastructure, Capabilities, Processes, Qualifications, Certifications, and Customer partnerships which are required to succeed and grow in increasingly demanding global programmes.

Our evolution has been from build-to-print manufacturing towards a broader engineering and industrialisation capability. Today, Kineco Aerospace & Defence has experience across structural and semi-structural composite components and assemblies, Engine Components, aircraft interiors, UAVs and space applications, supported by autoclave manufacturing, precision machining, advanced NDI and stringent aerospace quality systems.

We have also developed long-term relationships with global OEMs and Tier-1 suppliers, including Airbus, Boeing, Safran, Israel Aerospace Industries, GKN Aerospace and FACC. The next phase is about moving further up the value chain — from being a reliable Components manufacturing partner to becoming a Partner capable of supporting industrialisation, engineering and eventually growth partner.

**Q Kineco has capabilities across aircraft, helicopter and space applications. What capabilities give the company an edge when competing for demanding global aerospace programmes?**

**A** In aerospace, the differentiator is rarely a single machine or process. It is the ability to integrate material, process, quality, engineering and programme execution at aerospace certified scale consistently with no failure. Kineco has built capabilities across the complete composite manufacturing chain: material handling and traceability, tooling, complex lay-up, autoclave curing, machining, NDI including automated ultrasonic inspection, dimensional inspection and aerospace-quality systems. Our experience across defence and commercial aircrafts, UAV and space projects gives us exposure to different levels of performance, reliability and qualification requirements. Importantly, we have demonstrated that these capabilities can be deployed not only for development but also for repeatable series production. What gives us edge when competing for demanding global aerospace programmes is our 30 years lineage of working with Composite business since 1995 composites supplier operating across diversified businesses: Railways, Defence, Aerospace, and Renewable Energy. For global customers, that combination of capability, quality discipline, responsiveness and the ability to scale is what makes the difference.

**Q India is becoming an increasingly important aerospace manufacturing hub. What opportunities do you see for Indian composite manufacturers within the global aircraft supply chain?**

**A** The opportunities for Indian Composite manufacturers are abundant and significant because global aerospace supply chain is going through its toughest phase and is is looking towards India for additional, resilient and competitive sources of supply, while India is developing a much deeper aerospace manufacturing ecosystem.

Composites are particularly interesting because India can build capabilities around the entire value chain from material processing




*"To build globally competitive advanced-composites capability from India, for the world."*

and tooling to manufacturing, machining, inspection and eventually engineering. However, the opportunity goes beyond simply moving manufacturing to India. The real opportunity is to establish India as a strategic aerospace manufacturing and engineering base that can support global programmes over decades.

For Indian composite manufacturers, this means developing the necessary capacity and capabilities to win awards from global aerospace Tier-1s and OEMS, demonstrate consistent quality and delivery performance, build the confidence required for critical aerospace applications and then confidently deep dive to take on increasingly complex work packages.

**Q What are international aerospace OEMs looking for from Indian suppliers today, beyond cost competitiveness?**

**A** Cost remains important, but it is no longer sufficient. International customers are looking for quality, delivery reliability, technical capability, scalability and supply-chain resilience. They want suppliers who understand aerospace processes and can demonstrate repeatability, traceability and configuration control. They also increasingly expect suppliers to participate in industrialisation, process improvement and engineering rather than simply manufacture against a drawing.

Perhaps most importantly, OEMs need confidence that a supplier can support a programme for the long term. They want Suppliers who can perform consistently in quality and delivery and grow with them by investing in capacity and capabilities ahead of time. Aerospace programmes have very long lifecycles, so the question is not simply "Can you make this part?" but "Can you reliably support this programme as volumes, specifications and requirements evolve?" That is the level at which Indian suppliers need to compete.

**Q Composite materials are becoming increasingly important in modern aircraft and spacecraft. Where do you see the next major opportunities for advanced composites in aviation?**

**A** The opportunity extends well beyond simply increasing the percentage of composites in conventional aircraft structures. We see significant potential in next-generation aircraft architectures, UAVs, eVTOL and autonomous platforms, spacecraft and satellites, and increasingly complex aircraft interiors and systems integration. Since the Ukraine Russia war and later on in US-Iran conflict, we have seen the way modern warfare is and will be fought. Autonomous platforms are particularly interesting because weight efficiency, aerodynamic performance, payload capacity and structural integration are critical. Kineco is therefore developing capabilities around what we call our Composite Centre of Excellence for Autonomous Solutions, covering applications across UAVs, VTOL and other autonomous platforms. Another major opportunity is the increasing integration of composite structures with metallic components, systems and functional elements. The future will increasingly be about engineered composite systems rather than individual composite parts.

**Q Kineco's acquisition of the remaining stake in Kineco Kaman Composites India strengthened its position in aerospace. How does this development support the company's long-term global aerospace strategy?**

**A** tThe consolidation of the Aerospace Composite business with the Kineco Group business gives Kineco greater strategic control over its aerospace capabilities and enables us to take a more integrated view of technology, capacity, customer relationships and future investment. Till we were part of Kineco Kaman JV, the business development activity was handled by respective Kaman entities having presence in Europe and USA. This was limiting Kineco's ambition to engage with global aerospace Tier-1s and OEMs. Once Kineco management decided to acquire Kaman's stake in the Kineco Kaman JV, there was no stopping us to expand our engagements with leading aerospace players in Europe and UK and we immediately won 2 long term contracts with GKN Aerospace and FACC with serious engagements in pipeline with other customers.

Our ambition is not to build an aerospace business that is dependent only on one geography or one programme. We want to create a globally integrated aerospace composites platform, with India as a major manufacturing and engineering base. The development also provided a stronger




foundation for investing in new technologies, capacity and customer programmes, while leveraging Kineco's broader international relationships and market access. Ultimately, it strengthens our ability to participate in larger and more complex global aerospace programmes.

**Q What are the biggest challenges facing India's aerospace manufacturing ecosystem today, particularly in advanced materials, technology, skilled talent and supply-chain resilience?**

**A** India has made considerable progress, but the aerospace manufacturing ecosystem still needs to deepen. One challenge is access to qualified aerospace-grade materials and a broader domestic supplier base. Most of the Customer qualified Raw Materials, consumables and metallic hardware requiring Special Process Treatment still need to be procured from international supply chains partners. Developing reliable dual sources and progressively localising appropriate elements of the supply chain will be important.

The second is specialised talent. Aerospace composites require a combination of materials knowledge, manufacturing discipline, process engineering, quality and programme management. Building this talent takes time and hands-on experience.

The third is technology depth. India has demonstrated that it can manufacture sophisticated aerospace components, but the next step is developing greater capability in engineering, design, qualification and industrialisation.

Finally, aerospace requires long-term thinking. Building a globally competitive supplier ecosystem requires sustained investment in technology, infrastructure, people and certification and customers need to provide sufficient programme visibility to support those investments.

**Q Looking ahead over the next five years, what is your vision for Kineco's aerospace business, and what role can India play in the global advanced aerospace composites market?**

**A** Our ambition over the next 5 years is to establish Kineco as a globally relevant advanced composites partner, with India at the centre of our manufacturing and engineering capabilities. We want to move progressively from build-to-print towards build-to-specification and design-to-build, while expanding our presence across commercial aerospace, defence, autonomous platforms and space. During the recently concluded Farnborough Air Show, we announced launch of Kineco Composite Centre of Excellence with a focus on the specialized engineering, design, and manufacturing of complex composite structures for Unmanned Autonomous Systems spanning Aerial, Land, & Maritime sectors. We will be industrialising our expanded manufacturing facility in October with the commissioning of our massive 3-meter x 12-meter Scholz Autoclave, which will straight away be put to work for the eVTOL contract we won recently and many more aerospace projects having components with larger dimensions.

Kineco will continue to expand ahead of time in building capacities and acquiring capabilities so you can expect us to place orders for our 4th autoclave wherein we are going in for a 4m-Dia Autoclave, again a capacity enhancer for Kineco which will put us in select grade of Suppliers having this capability.

For India, I believe the opportunity is much larger than becoming a low-cost manufacturing destination. India is now geared up to stake a claim as globally Best-cost manufacturing location, with talent comparable to the best in the world, modern infrastructure, digitalisation, automation and global best practices. The key will be building trust through quality, consistency, technology and execution. If Indian companies can demonstrate those capabilities at scale, the country can move from being viewed primarily as a sourcing destination to becoming a strategic partner in the global aerospace ecosystem.

For Kineco, that is the opportunity we are working towards: to build globally competitive advanced-composites capability from India, for the world. I have no doubt that, with the distinct advantage of a strong balance sheet and ability to scale, Kineco will be leading this drive with other Indian players.

# ARMANETICS INTRODUCES ARMANET FOR SINGLE-OPERATOR DRONE SWARMS

Ranchi-based defence technology startup Armanetics has unveiled ARMANET, a mission operating platform designed to let one operator coordinate multiple unmanned aerial vehicles as a unified swarm rather than control each aircraft separately.

The company describes ARMANET as software for mission planning, command, telemetry and coordinated autonomous operations across multiple unmanned systems. Intended functions include simultaneous deployment, user-defined formations, coordinated payload delivery, information sharing and mission-level task assignment.

Armanetics has said it conducted field trials



of ARMANET in the presence of senior Indian Army leadership. The company views the trials as a step in developing its own platform for swarming and autonomous mission execution. Publicly available information does not establish an Army procurement, induction or operational deployment, so the event should be treated as a demonstration rather than an acquisition.

The company is also developing PARAM, a fixed-wing unmanned aircraft intended for target-drone training, autonomous decoy missions and possible future coordinated aerial operations.

The platform reflects a broader move from individual UAV control towards software-led coordination of multiple aircraft. Its practical value will depend on reliable communications, autonomy, cybersecurity, resilience to electronic interference and appropriate human oversight as systems progress from controlled trials to operational environments.

# BONV AERO REACHES GENIUS NY FINALS WITH HEAVY-LIFT DRONE



Indian drone company BonV Aero has reached the finals of GENIUS NY, an accelerator programme focused on uncrewed systems and related technologies, with a heavy-lift drone described as capable of carrying a payload of more than 100 kilograms. The selection gives the company an opportunity to present its technology within an international innovation programme centred on unmanned aircraft and autonomous systems. Heavy-lift drones are designed for missions where the payload is too large for smaller multirotor aircraft, potentially supporting logistics and transport tasks in locations where road access is difficult or slow. For a heavy-lift platform, payload capacity is only one part of operational performance. Range, endurance, loading procedures, safety systems, reliability and the ability to operate within applicable aviation rules all influence whether a system can be used commercially or for specialised missions. BonV Aero has been developing unmanned aircraft for payload-carrying and logistics applications. Its participation in GENIUS NY provides a route to international visibility and engagement with an ecosystem of startups, investors and industry stakeholders working on uncrewed systems. Reaching the finals should not be interpreted as a confirmed investment, customer order or commercial deployment.

# CSIR-NAL Unveils Indigenous Micro and Small Gas Turbine Engines

CSIR–National Aerospace Laboratories has unveiled three indigenous micro and small gas turbine engines intended to support India's defence and unmanned aviation requirements. The engines, designated NJ-05, NJ-50 and NJ-100, provide thrust ratings of 5 kg, 50 kg and 100 kg respectively. The systems were presented at the SSB Auditorium at CSIR headquarters in New Delhi. Their envisaged applications include tactical unmanned aerial vehicles, drone interceptors and compact missile systems, where small propulsion units can be important to platform design and mission performance. The event brought together representatives of India's scientific and defence communities. Air Marshal Tejinder Singh, Chief of Integrated Defence Staff to the Chairman Chiefs of Staff Committee, attended as chief guest. CSIR-NAL Director Abhay A. Pashilkar highlighted the laboratory's role in integrating technologies for India's expanding drone ecosystem and said domestic industry could help manufacture the engines at scale. The development team's technical presentation covered advances in high-speed turbomachinery and high-temperature combustion technology. CSIR leadership described indigenous development of specialised propulsion subsystems as an important step towards greater self-reliance in aerospace engineering. The unveiling marks a development milestone, while wider industrial production will depend on manufacturing readiness and programme requirements.



# DRONEYARDS DEVELOPS TWO-HOUR-ENDURANCE VTOL UAV FOR ISR MISSIONS

DroneYards has introduced a vertical take-off and landing unmanned aircraft designed for intelligence, surveillance and reconnaissance missions, with a reported endurance of up to two hours. The platform is intended to combine runway-independent operation with the ability to remain airborne for extended observation. The aircraft is described as a five-metre-class VTOL system with a five-kilogram payload capacity and a reported one-way range of 40 kilometres. Its sensor package includes an electro-optical and infrared imaging payload, with day-and-night surveillance, thermal imaging, optical zoom and a stabilised gimbal for tracking. The company also highlights a carbon-fibre airframe and a navigation architecture designed to improve resilience. VTOL capability can be useful in locations where a conventional runway is unavailable or impractical, including confined



sites and remote operating areas. For ISR missions, endurance and payload integration influence how long an aircraft can observe an area and what information it can collect during a sortie. DroneYards says the platform has been engineered and manufactured in-house. The aircraft is intended for reconnaissance and payload-delivery roles, though mission suitability will depend on configuration, operating conditions and customer requirements. The two-hour figure is a stated performance specification; actual endurance can vary with payload, weather and flight profile.

# EyeROV Showcases Indigenous Underwater Robotics at BRICS Exposition



Kochi-based deep-tech company EyeROV showcased its underwater robotics technology at the Bharat Innovates Exposition in New Delhi, organised by the Ministry of Education as part of the BRICS Summit. The company's pavilion was visited by several national leaders, and co-founder and chief executive Johns T. Mathai demonstrated its remotely operated vehicle technology. EyeROV develops robotic systems for underwater inspection and marine operations. Its portfolio includes remotely operated vehicles (ROVs), autonomous underwater vehicles (AUVs), unmanned surface vehicles (USVs), specialised marine inspection systems and data analytics tools. Underwater inspection can be difficult and costly at sites such as dams, bridges, ports and offshore installations. Robotic platforms can help operators examine submerged structures, collect visual and operational data, and assess conditions without relying solely on divers. Such systems may support infrastructure maintenance, maritime security, defence and scientific research. The exposition provided an opportunity to present Indian-developed marine technology to an international audience. EyeROV has said it aims to expand its global presence while developing indigenous engineering solutions for practical inspection and subsea tasks. The company's technology spans several categories of marine robotics, so capabilities depend on the specific platform selected and its configuration.

# ideaForge Reports ₹68.6 Crore Revenue in Q1 FY27 with Positive EBITDA

ideaForge Technology Limited reported revenue of ₹68.6 crore for the first quarter of FY2027, alongside positive EBITDA, as the Indian unmanned aircraft systems company continued work on its order book and next-generation capabilities.

The company said it completed a qualified institutional placement worth ₹500 crore, with participation from domestic and international institutional investors. It is focused on delivering its opening FY2027 order book, which management expects to execute by the third quarter.

During the quarter, ideaForge also reported progress in developing combat-drone capabilities, including air-launched effects and fuel-hybrid, long-endurance technology for its ZOLT platform. These development areas reflect growing interest in unmanned aircraft designed for demanding operational profiles.

The company's near-term focus remains execution: converting existing orders into deliveries while advancing technologies that could broaden its portfolio. Its financial update comes amid continuing efforts by Indian drone manufacturers to build domestic design, production and support capabilities for defence and other professional applications.

The reported figures provide a snapshot of ideaForge's first-quarter performance; further progress will depend on delivery schedules, customer requirements and the development of its newer systems.



# INDIAN ARMY ORDERS 225 HIGH-ALTITUDE FPV DRONES FROM AERODRONE

The Indian Army has placed an order for 225 first-person-view drones from AeroDrone Robotics following competitive evaluation and field trials at altitudes of up to 17,500 feet. The order highlights the military's interest in compact unmanned systems capable of operating in demanding Himalayan environments. According to published reporting, the drones were assessed on operational parameters including endurance, speed, accuracy and overall performance in challenging terrain. FPV drones provide operators with a real-time aerial video view and can support surveillance, reconnaissance and tactical decision-making, depending on their



configuration and assigned mission. High-altitude operations pose specific engineering challenges. Reduced air density affects the lift generated by propellers, low temperatures can reduce battery performance, and mountainous terrain can obstruct radio links between aircraft and operators. Trials under these conditions are relevant to assessing whether a drone can meet frontline operational needs. AeroDrone Robotics is identified in reporting as a Gurugram-based company working in military unmanned systems and providing training and technical support. The order adds to the role of domestic manufacturers in developing equipment for specific requirements of the armed forces. The contract value and detailed aircraft specifications have not been established in the available source material.

## Indrajaal-Sigma Consortium Wins ₹155 Crore Counter-Drone Orders




The Indrajaal-Sigma consortium has secured government orders worth approximately ₹155 crore for the Indrajaal Ranger mobile counter-unmanned aircraft system. The orders comprise about ₹145 crore for border security and roughly ₹10 crore for urban policing, VVIP protection and city security.

The Ranger is designed as a mobile anti-drone patrol vehicle, intended to detect, track, identify and counter unauthorised drones while moving. Built on a Toyota Hilux platform, the system combines Indrajaal's SkyOS platform with sensors, sensor-fusion technology, command-and-control tools and layered countermeasures.

The companies describe capabilities that include radio-frequency jamming, GNSS spoofing and cyber takeover; the wider Ranger architecture also includes hard-kill interception options.

The order follows a strategic relationship between Sigma Advanced Systems and Indrajaal Drone Defence focused on indigenous radar and electronic-warfare subsystems for counter-drone applications.

The contract points to demand for mobile counter-UAS systems alongside fixed-site protection. Such vehicles may be relevant to borders, critical infrastructure and high-risk urban locations where security teams need to identify and respond to drone threats. The source does not provide a detailed delivery schedule for the new orders.

## Indrones Secures Second Type Certification for Sigma100 UAV

Indian drone technology company Indrones has secured its second Type Certification, this time for its Sigma100 multi-mission unmanned aerial vehicle. The company says the platform is designed to support mapping, surveying and other professional applications through a configurable payload architecture. The Sigma100 can carry different sensors according to mission requirements. Listed options include a 61-megapixel mapping sensor mounted on a stabilised gimbal, a five-angle oblique camera for high-coverage mapping, LiDAR for



terrain and structural data capture, and a compact mapping camera with obstacle avoidance. The company also highlights a quick-change payload arrangement. These options are intended to support aerial mapping, surveying, infrastructure inspection and three-dimensional documentation of terrain and assets. Indrones' technical material also lists LiDAR, multispectral, integrated day-and-night 4K and optical-zoom configurations among compatible payloads. The aircraft is supported by EigenOS, the company's in-house software stack. Type Certification is an important regulatory milestone for applicable Indian UAV models, demonstrating that a platform has completed the required conformity assessment. The Sigma100 certification adds another domestically developed aircraft to India's pool of certified professional UAVs.

# L&T ADVANCES INDIGENOUS DRONE AND AUTONOMOUS SYSTEMS STRATEGY

Larsen & Toubro (L&T) is expanding its presence in India's unmanned systems sector, showcasing indigenous technologies and engaging 21 drone startups at its Manthan Drone Demo Day in Bengaluru on 7 August 2026.

The event highlighted two key developments: Vedh Mk1, a runway-independent hybrid vertical take-off and landing remotely piloted aircraft designed for surveillance and reconnaissance, and Chanakya, a collaborative autonomy framework intended to coordinate unmanned platforms across aerial, ground, surface and underwater environments.

According to the company, Chanakya has progressed from hardware-in-the-loop simulations to live flight demonstrations and field validation. The framework reflects a shift from standalone drone platforms towards networked systems that can coordinate missions using decentralised intelligence.



L&T's wider engineering, defence electronics, shipbuilding and aerospace capabilities could support integration of these technologies into broader defence systems. Its Precision Engineering and Systems division, which includes drone and unmanned aircraft activities, currently contributes around 3% of group revenue. The company expects the division's revenue to triple over the next five years.

The Manthan initiative also gives L&T a channel to assess deployment-ready technologies from India's startup ecosystem for potential collaboration and wider application across its businesses.

# PIPER SERICA BACKS ALGOFET'S AUTONOMOUS DRONE INFRASTRUCTURE




Piper Serica has announced an investment in AlgoFET, a Bengaluru-based startup developing autonomous ground infrastructure intended to keep drones powered and ready for repeated missions.

The company's focus is on the operational layer between flights, including docking, charging and fleet monitoring. Drone operations can require staff to retrieve aircraft, replace or recharge batteries, check system status and prepare each vehicle for its next task. AlgoFET aims to reduce this manual work through an integrated technology stack that combines autonomous docking mechanisms, intelligent battery management, high-power charging, embedded electronics and firmware, and cloud-based fleet monitoring.

The infrastructure is intended to support continuous or unattended operations across defence, enterprise and other critical applications. Such systems could be relevant where drones are expected to perform recurring inspections, surveillance or logistics tasks and where downtime between missions affects service availability. Piper Serica's investment adds financial backing to a part of the drone ecosystem that receives less attention than aircraft design itself. Automated ground infrastructure may become increasingly important as operators move from occasional flights to managed fleets. The commercial opportunity will depend on reliability, compatibility with different drone platforms, safe charging and docking, and the ability to operate in varied environmental conditions.

# SkyDrive to Assess Indian Routes for eVTOL Medical Logistics

Japanese electric vertical take-off and landing aircraft developer SkyDrive will evaluate potential routes in India for medical logistics services under a feasibility-study partnership with Air India and Suzuki. The three organisations signed a memorandum of understanding in July 2026 to examine whether eVTOL aircraft could support urgent deliveries. The study will identify routes where air transport may help address delays caused by road congestion. One proposed use case is moving radioactive isotopes used in cancer diagnosis and treatment from a manufacturing facility in Mumbai to nearby major hospitals. Because these materials have short half-lives, the partners intend to assess whether air logistics could improve delivery timing. A second use case concerns emergency medical supplies and organ transport between hospitals in the Delhi National Capital Region. The study will examine the feasibility of reducing journeys that may take 30 to 90 minutes by ambulance to an estimated 10 to 15 minutes by air. The programme may also assess transport of aircraft parts between collection hubs, maintenance bases near Delhi's Indira Gandhi International Airport and airport maintenance areas. Such deliveries could help reduce delays associated with aircraft-on-ground events. The routes are preliminary candidates for evaluation, not announced operational services.



# TIHAN-IIT HYDERABAD AND APDC PARTNER TO DEVELOP DRONE CITY

TiHAN-IIT Hyderabad has signed a memorandum of understanding with the Andhra Pradesh Drones Corporation (APDC) to collaborate on the development of Drone City and the wider drone ecosystem in Andhra Pradesh.

The partnership brings together TiHAN's research and infrastructure in autonomous navigation, unmanned aircraft technology, testing and innovation with the state's efforts to build drone-related capabilities. The agreement was signed in the presence of Union Civil Aviation Minister Ram Mohan Naidu Kinjarapu, MP B. Nagaraju Panchalinga, IIT Hyderabad Director B. S. Murty and TiHAN Hub Executive Officer Santhosh



Reddy D.

TiHAN is a Department of Science and Technology-backed technology innovation hub focused on autonomous navigation, smart mobility and cyber-physical systems. Its facilities include drone testing, simulation, UAV and advanced air mobility research, beyond-visual-line-of-sight infrastructure and certification support.

The collaboration could help connect research institutions, startups, manufacturers and government-led initiatives. Potential areas include research, testing, certification, skills development and commercial deployment.

For Andhra Pradesh, the challenge will be to translate the proposed Drone City concept into practical infrastructure and services. The memorandum establishes a basis for cooperation, but the source does not specify a completion date or investment amount.

## Vimag Labs Starts Jhajjar Manufacturing and Plans ₹50 Crore Investment




Vimag Labs has begun manufacturing motor and control systems at its first dedicated production facility in Met City, Jhajjar, Haryana. The Bengaluru-based deep-technology company says the site has already completed and exported its first production batch. The facility covers 10,000 square feet, with the option to expand to approximately 20,000 square feet. It manufactures and assembles motor and control systems, related propulsion equipment and the company's proprietary magnet-free motor technology. The setup includes testing infrastructure, digitally connected production systems, traceability and automated manufacturing processes. Vimag currently plans around ₹50 crore in phased investment across its manufacturing expansion. The timing and scale of spending will depend on customer demand, programme growth and product requirements. The company aims to scale the network towards capacity of up to 10,000 motor and control systems per month as volumes increase. Initial production is focused on mid-power applications across electric mobility and other electrified systems. Higher-power motor and control systems rated at 570 kW and above are planned as customer programmes mature. Vimag also expects the broader build-out to create around 100 to 150 direct and indirect employment opportunities.

## Yali Aerospace Selected for Drone-Based Surveillance at Mumbai Port

Yali Aerospace has been selected for a grant-backed proof of concept at Mumbai Port focused on strengthening compliance with international rules governing pollution from ships. The initiative is intended to demonstrate how aerial surveillance can help identify potential oil spills and illegal discharges in port waters. The project is supported by the National Technology Centre for Ports, Waterways and Coasts (NTCPWC). Under the proof of concept, Yali's ISR drones are expected to provide aerial intelligence and real-time observation to help detect possible violations and improve situational awareness for maritime authorities. Monitoring port waters can be challenging because activity is spread across busy operating areas and some incidents may be difficult to observe from shore. Drone-based observation offers a flexible viewpoint and may help teams focus attention on areas requiring closer inspection. Any findings would still need appropriate verification and follow-up by the responsible authorities. Yali Aerospace has highlighted its experience operating drones in coastal environments. The Mumbai Port project applies that experience to maritime environmental monitoring, where timely detection can support response and enforcement processes. The initiative is a proof of concept rather than evidence of a fully deployed port-wide system.



# AERIAL IQ SECURES DGCA TYPE CERTIFICATION FOR TETHERED DRONE

Aerial IQ has secured Directorate General of Civil Aviation (DGCA) Type Certification for a tethered drone, marking a regulatory milestone for the company's unmanned aircraft offering in India. Tethered drones are connected to a ground station by a physical cable, which can provide power and a data link while the aircraft remains airborne. This configuration can support persistent observation and monitoring where operators need an aerial viewpoint for extended periods, subject to the system's design and operating approvals. Aerial IQ's earlier Aviral RH8 platform has been described as an indigenous tethered drone designed for continuous surveillance, with payload options and secure data transfer. The certification announcement signals progress in the company's effort to bring tethered unmanned aircraft into regulated use. The precise model and conditions covered by the



latest certificate should be confirmed against the DGCA's official record before making claims about approved configurations or operating limits. Type Certification is an important step for applicable drone models because it establishes that a system has met prescribed airworthiness and safety requirements. It does not, by itself, replace operational permissions that may be required for a particular location or mission.

# AIRBOUND RAISES $37 MILLION TO SCALE AUTONOMOUS DRONE DELIVERY




Indian autonomous aircraft startup Airbound has raised $37 million in a Series A funding round led by Greenoaks, with participation from DoorDash, Lachy Groom, Lightspeed Venture Partners and Humba Ventures. The financing brings the Bengaluru-based company's total funding to nearly $50 million since its launch in 2023. Airbound plans to use the capital to advance aircraft engineering, expand manufacturing and grow commercial operations. Its TRT platform uses a tail-sitter configuration, taking off vertically before transitioning to horizontal flight. The company is developing lightweight autonomous aircraft intended to carry a high payload relative to their own weight. Airbound says it has completed more than 13,000 autonomous flights, including over 1,000 missions for Narayana Health. These healthcare operations have involved transporting diagnostic samples between facilities, with the company reporting that some deliveries were reduced from hours by road to minutes by air. The funding follows an agreement with Andhra Pradesh Drones Corporation to develop a drone-delivery network across Amaravati, Vijayawada and Guntur. The partners are targeting up to 10,000 flights daily by the end of 2026 for healthcare, retail and e-commerce logistics. Reaching that scale will require aircraft production, fleet operations, airspace coordination and regulatory infrastructure.

# Alteon Raises $2.5 Million for Long-Endurance Autonomous Aircraft

Bengaluru-based aerospace startup Alteon has raised $2.5 million in pre-seed funding led by Lachy Groom, with participation from Together Fund, to develop autonomous aircraft intended for extended flight. The company said the funding follows a low-altitude flight demonstration over the Bay of Bengal. Founded in 2025 by Samay Sanghvi, Alteon is developing small fixed-wing aircraft that use dynamic soaring, a technique inspired by albatrosses. The approach seeks to extract energy from differences in wind speed and direction. The company's long-term ambition is to build aircraft capable of remaining airborne for more than a year, although that duration has not yet been demonstrated. During a recent test, the aircraft autonomously completed repeated flight loops at approximately one metre above the ocean surface. The demonstration addressed a key technical challenge: executing low-altitude manoeuvres needed to harvest energy from changing wind conditions. Alteon plans to use the capital to expand research and development, conduct further offshore testing and pursue energy-neutral dynamic soaring, in which the aircraft could sustain flight without continuous propulsion. The startup's initial target market is maritime surveillance, with possible applications in ocean and weather monitoring, ship and fishing activity tracking, infrastructure protection, search and rescue, scientific research and defence.



# "SHAPING INDIA'S AEROSPACE FUTURE: AI, SPACE TECHNOLOGY AND THE NEXT GENERATION OF ENGINEERS"

*In Conversation with Dr. M. Suresh Kumar, Professor & Head -Aerospace/Aeronautical/Avionics Engineering - Interview by Sundeep Mehta, Editor, Aviation Insights.*



## Dr. M. Suresh Kumar

### Head -Aerospace Engineering, Ajeenkya DY Patil University

**Q** **India's space sector is expanding rapidly. What opportunities do you see emerging for students pursuing aerospace and aeronautical engineering today?**

**A** India's aerospace and space sectors are currently undergoing a transformative phase. The successful missions of ISRO, the opening of the space sector to private participation, and the rise of aerospace startups have created unprecedented opportunities for students. Today, aerospace graduates can pursue careers in satellite design, launch vehicle development, unmanned aerial systems, aircraft manufacturing, defense technologies, space research, and advanced avionics.

Beyond traditional organizations like ISRO, DRDO, and HAL, students now have opportunities in emerging private space

companies, drone startups, and international aerospace firms. Additionally, fields such as space tourism, satellite communication, remote sensing, and planetary exploration are expected to generate significant employment and research opportunities in the coming years. For aspiring engineers, this is one of the most exciting periods to enter the aerospace industry.

**Q Your research spans avionics, RADAR, and navigation systems. Which technological advancement do you believe will have the greatest impact on the future of aerospace engineering?**

**A** Among the many technological advancements shaping aerospace engineering, Artificial Intelligence and autonomous systems stand out as the most transformative. AI-powered systems can process vast amounts of flight data in real time, improve navigation accuracy, optimize fuel efficiency, and enhance safety through predictive maintenance.

In addition, next-generation avionics integrated with advanced sensors, machine learning algorithms, and intelligent decision-making capabilities will significantly improve aircraft and spacecraft performance. Emerging technologies such as autonomous drones, urban air mobility solutions, and AI-assisted mission planning are already redefining the aerospace landscape.

Furthermore, advancements in quantum navigation, advanced RADAR technologies, and satellite-based communication systems will play a critical role in enabling safer and more efficient aerospace operations. These innovations will shape the future of both aviation and space exploration.

**Q How is academia evolving to meet the needs of the aerospace and defense industries, particularly in the age of AI and space technology?**

**A** The role of academia has evolved significantly over the last decade. Educational institutions are moving beyond conventional classroom teaching and focusing more on experiential learning, interdisciplinary research, and industry collaboration. Today's aerospace curriculum incorporates emerging areas such as Artificial Intelligence, machine learning, robotics, autonomous systems, drone technologies, and space systems engineering.



*"Today's students are entering aerospace engineering at one of the most exciting periods in history. Those who remain curious, embrace emerging technologies, and continuously innovate will help shape India's journey as a leading space-faring nation."*

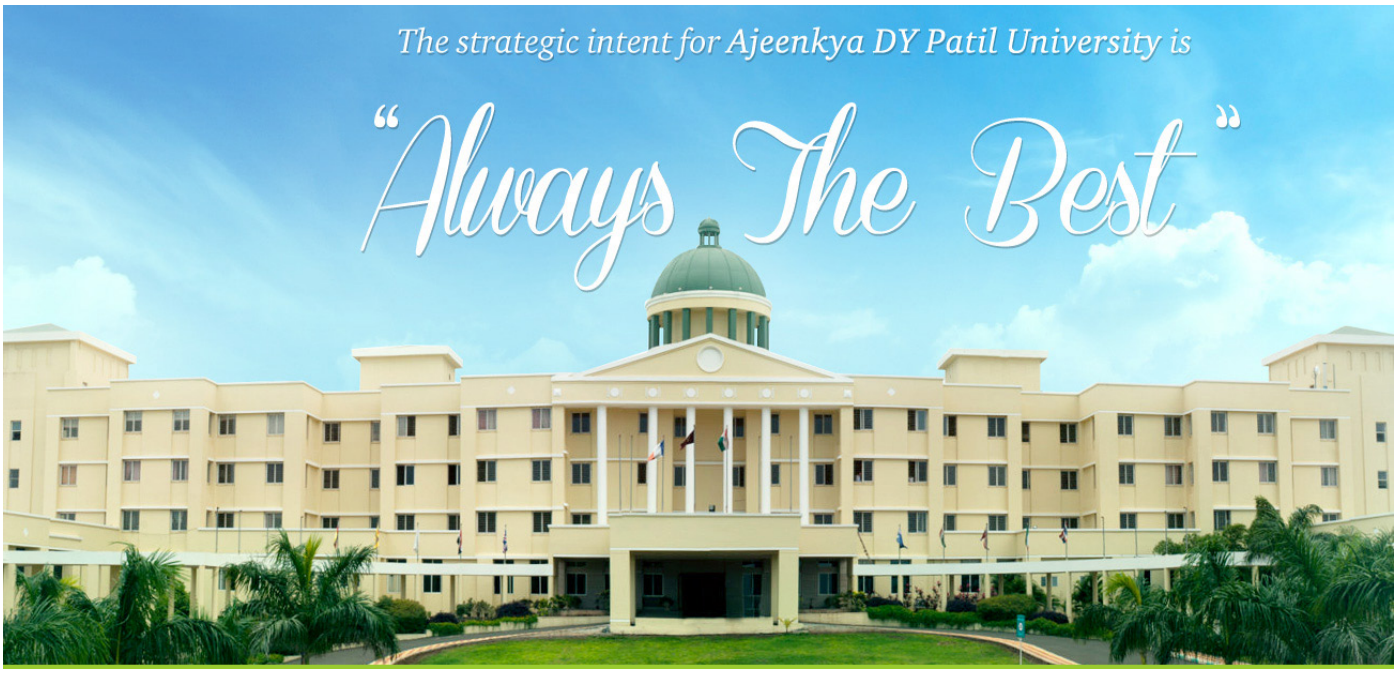
Universities are also establishing innovation centers, research laboratories, and incubation hubs where students can work on real-world engineering challenges. Collaborations with aerospace companies and research organizations enable students to gain hands-on experience through internships, industry projects, and research initiatives.

The objective is to produce graduates who are not only technically competent but also capable of adapting to rapidly evolving technologies. Industry-oriented education ensures that students are prepared to contribute effectively from the very beginning of their professional careers.

**Q What skills and competencies should engineering students focus on if they aspire to work with organizations such as ISRO, DRDO, or leading aerospace companies?**

**A** Success in aerospace engineering requires a combination of strong technical knowledge and professional skills. Students should develop a solid foundation in mathematics, physics, aerodynamics, propulsion, control systems, and structural analysis. These fundamentals form the backbone of aerospace engineering.

In addition, proficiency in programming, simulation tools, computer-aided design software, and data analysis has become increasingly important. Students should actively participate in technical projects, competitions, internships, and research activities to gain practical exposure.




Equally important are soft skills such as communication, teamwork, leadership, and critical thinking. Aerospace projects are often highly collaborative and multidisciplinary, requiring engineers to work effectively across teams. A mindset of continuous learning and curiosity is essential, as technology in this field evolves rapidly.

**Q As an educator and researcher with multiple patents and publications, how do you balance innovation, teaching, and mentorship?**

**A** I view teaching, research, and mentorship as interconnected aspects of the same mission—advancing knowledge and inspiring future innovators. Research allows me to stay connected with emerging technologies and industry developments, which enriches my classroom discussions and helps students understand real-world applications of engineering concepts.

At the same time, mentoring students often provides fresh perspectives and innovative ideas. Young minds bring creativity and enthusiasm that can lead to meaningful research outcomes. By involving students in research projects, publications, and innovation activities, I can contribute to their professional growth while also advancing scientific knowledge.

*"To build globally competitive advanced-composites capability from India, for the world."*

Balancing these responsibilities requires effective time management, collaboration, and a genuine passion for learning. Ultimately, seeing students succeed and contribute to society is one of the most rewarding aspects of an academic career.

**Q What are some of the most exciting research areas currently shaping aerospace and space engineering?**

**A** Aerospace engineering is experiencing remarkable advancements across multiple domains. Reusable launch vehicles are reducing the cost of space access and making space exploration more sustainable. Satellite technology continues to evolve, enabling improved communication, navigation, climate monitoring, and disaster management.

Research in autonomous drones and unmanned aerial vehicles is creating opportunities in logistics, agriculture, surveillance, and defense. Advanced propulsion systems, including electric and hybrid propulsion, are helping to make aviation more environmentally sustainable.

Other exciting areas include space robotics, planetary exploration technologies, hypersonic vehicles, smart materials, and artificial intelligence-driven aerospace systems. These innovations have the potential to redefine how humans travel, communicate, and explore beyond Earth.

**Q With private companies increasingly entering the space sector, how do you foresee collaboration between academia, industry, and government agencies shaping the future of space exploration?**

**A** The future of space exploration will depend heavily on strong collaboration among academia, industry, and government organizations. Each stakeholder brings unique strengths to the ecosystem. Universities contribute research, innovation, and a skilled talent pool. Industry partners

provide technological expertise, investment, and practical implementation capabilities. Government agencies offer strategic direction, infrastructure, and regulatory support.

Such collaborations accelerate technology development and reduce the time required to transform research into practical applications. Students benefit from exposure to real-world challenges, while industries gain access to innovative solutions and skilled professionals.

India's growing space ecosystem presents an excellent opportunity to build a collaborative model that fosters innovation, entrepreneurship, and global competitiveness. This partnership-driven approach will be crucial in achieving ambitious goals in space exploration and aerospace technology.

**Q What advice would you give to young innovators who want to contribute to India's ambition of becoming a global leader in aerospace and space technology?**

**A** My advice to young innovators is simple: remain curious, stay committed, and never be afraid to dream big. Every major scientific achievement began with a question and the determination to find an answer. Students should focus on building strong technical foundations while developing creativity, problem-solving skills, and resilience.

They should actively seek opportunities to participate in research projects, technical competitions, innovation challenges, and internships. Learning should extend beyond textbooks through experimentation, collaboration, and practical application.

Most importantly, young innovators should view failures not as setbacks but as valuable learning experiences. The aerospace industry demands perseverance, precision, and patience. Those who remain focused on continuous improvement will be well-positioned to contribute to India's scientific and technological advancement.

**Q Looking ahead to the next decade, what do you believe will be India's most significant achievement in aerospace or space exploration?**

**A** Over the next decade, I believe India will make significant strides in human spaceflight, deep-space exploration, advanced satellite technologies, and commercial space missions. Missions under the Gaganyaan program are expected to strengthen India's human spaceflight capabilities, while future lunar and planetary missions will expand our scientific understanding of the universe.

India is also likely to emerge as a major global provider of satellite services, launch capabilities, and space-based solutions. The increasing participation of private companies will further accelerate innovation and create new opportunities for economic growth.

What makes me particularly optimistic is the combination of scientific talent, technological expertise, and national ambition. Together, these factors position India to become one of the world's leading aerospace and space-faring nations.

**Q If you could introduce one breakthrough technology into aerospace engineering tomorrow, what would it be and why?**

**A** If given the opportunity, I would introduce highly advanced autonomous aerospace systems powered by Artificial Intelligence. Such systems could transform every aspect of aerospace operations, from aircraft management and air traffic control to deep-space exploration and autonomous planetary missions.

AI-driven systems would enhance safety by identifying potential issues before they become critical, optimize operational efficiency, and reduce human workload during complex missions. In space exploration, autonomous systems could operate in environments where human intervention is difficult or impossible.

As aerospace missions become increasingly complex, intelligent autonomous technologies will be essential for achieving greater reliability, efficiency, and exploration capability. I believe this breakthrough would have a profound impact on the future of aviation and space exploration worldwide.





# FROM INDIA TO THE WORLD: CAN INDIA BECOME A STRATEGIC AEROSPACE MANUFACTURING POWERHOUSE?

***India's aerospace industry is moving beyond basic component manufacturing towards more complex production, engineering and international programme partnerships. Global aircraft manufacturers are expanding their supplier relationships with Indian companies, but the next phase of growth will depend on quality, technology, investment and the ability to deliver consistently at scale.***

By Aviation Insights Editorial Team

## *A strategic opportunity takes shape*

The global aerospace industry operates on long production cycles, strict safety requirements and supply chains that can span dozens of countries. An aircraft delivered today may contain structures, systems, components and software developed by companies operating across several continents. Becoming part of this ecosystem requires much more than competitive manufacturing costs. Suppliers must demonstrate technical competence, financial stability, manufacturing consistency and the ability to support programmes over many years.

India is gaining a more substantial position within this environment. Its established engineering workforce, manufacturing base, growing industrial infrastructure and experience in precision production are attracting the attention of international aerospace companies. Indian suppliers are already contributing components, assemblies and engineering services to commercial aircraft and defence platforms.

The scale of this opportunity is reflected in sourcing commitments made by major manufacturers. Airbus reported in March 2026 that its annual sourcing from India had increased from approximately US$500 million in 2019 to more than US$1.5 billion, with a stated ambition to exceed US$2 billion before the end of the decade. Its Indian supplier network



includes more than 100 companies. Boeing, meanwhile, reports annual sourcing exceeding US$1.4 billion and a network of more than 375 Indian suppliers.

These figures indicate that India's role is no longer confined to occasional contracts or low-complexity work. Yet they should not be interpreted as proof that the country has already become a leading aerospace manufacturing hub on the scale of established production centres in North America, Europe or East Asia. The more important question is whether today's sourcing relationships can develop into sustained, higher-value industrial participation.

## *From cost advantage to manufacturing capability*

For many manufacturers, the initial attraction of India has been its engineering talent, industrial capability and potential for cost-effective production. These remain important strengths, but they are not enough to secure complex aerospace contracts.

Aircraft components must conform to highly controlled technical specifications. Materials, manufacturing processes, inspection records and product configurations need to be traceable. A supplier may be required to demonstrate how a component was produced, which materials were used, whether inspections were completed and how deviations were resolved.

Indian manufacturers are developing capabilities in machining, sheet metal, aerostructures, assemblies, advanced materials and engineering services. Airbus has announced contracts with Indian companies including Tata Advanced Systems and Mahindra Aerospace



Structures for components and assemblies for its A320neo, A330neo and A350 programmes.

Such contracts matter because aerospace manufacturing is built through demonstrated performance. A company that consistently delivers acceptable components, meets schedules and responds effectively to engineering changes is better positioned to be considered for additional work. Over time, this can create a pathway from individual part production to larger assemblies and more integrated manufacturing responsibilities.

However, the progression is not automatic. Suppliers have to invest in machinery, process controls, inspection equipment, workforce training and quality-management systems. They must also be prepared for customer audits and for the cost of maintaining aerospace-specific approvals. An investment may take years to generate meaningful returns, particularly when a new supplier must first complete qualification and production-ramp-up activities.

For India, the next step is therefore not simply to attract more contracts. It is to develop a wider pool of companies capable of delivering complex products repeatedly, at internationally competitive cost and at the required quality level.

## *The importance of global partnerships*

International partnerships have become one of the most practical routes through which Indian companies can enter the aerospace supply chain. A partnership may involve component manufacturing, engineering services, technology

transfer, joint ventures, assembly work or long-term supplier agreements. The structure differs from one programme to another, but the underlying objective is similar: combine local industrial capability with the technical requirements and global reach of an established aerospace company.

India's existing partnerships demonstrate how this model can work. Tata Boeing Aerospace Limited, a joint venture between Tata Advanced Systems and Boeing, manufactures Apache helicopter fuselages in Hyderabad for global customers and produces vertical fin structures for the Boeing 737 programme. Such operations connect Indian manufacturing directly to international programmes instead of limiting production to the domestic market.



For Indian suppliers, the value of these partnerships extends beyond the initial order. Working with a major manufacturer can expose a company to mature production systems, structured quality processes, configuration management and demanding delivery schedules. The experience can strengthen its ability to compete for other international programmes.

Nevertheless, a partnership announcement should not be confused with immediate industrial transformation. Technology transfer has to be meaningful, employees must acquire the necessary skills, and local suppliers must be allowed to develop greater responsibility over time. Some contracts may remain tightly defined manufacturing assignments, while others offer wider engineering or integration opportunities.

The commercial terms are equally important. Companies must understand who owns tooling, who pays for qualification, how engineering changes are managed, what happens when production volumes change and whether the expected order book justifies the required investment. A prominent international customer can strengthen a company's credibility, but excessive dependence on one programme or customer can expose the business to risk.

A successful partnership should therefore be measured not only by the value of the contract, but also by the capabilities developed, the sustainability of production and the potential to secure further business.

## *Moving up the value chain*

The aerospace value chain includes material production, precision machining, component manufacturing, subassembly production, systems integration, design engineering, testing, maintenance and technical support. Each activity requires different levels of expertise, capital investment and customer approval. A country can be competitive in several parts of this chain without manufacturing an entire aircraft domestically.

For Indian suppliers, the first priority should be to build depth in areas where they have credible capabilities and where global demand can support sustainable investment. These may include aerostructures, metallic components, precision-engineered parts, electrical and mechanical assemblies, aircraft interiors and selected composite structures.

Advanced composites deserve particular attention. These materials can offer useful combinations of strength, weight and design flexibility, but their production requires specialised materials knowledge, controlled processes, suitable tooling, inspection capability and experience in dealing with manufacturing defects. Producing a composite component to specification is only one part of the challenge; demonstrating repeatability and maintaining consistency across production batches are equally important.

The transition towards higher-value work also involves engineering. Companies that can interpret technical requirements, support design changes, perform detailed analysis and solve production problems can offer more to customers than those that operate only to supplied drawings. Over time, selected suppliers may progress towards build-to-specification arrangements or take responsibility for defined engineering packages.

That progression requires caution. Design responsibility introduces additional technical and commercial exposure. Manufacturers need appropriately qualified engineering teams, dependable validation methods, effective documentation and clarity over intellectual-property ownership. It is not realistic for every component manufacturer to become a design authority, nor is that necessary for the industry to grow.

India's opportunity is to build a layered ecosystem in which different companies specialise according to their strengths. Large manufacturers can undertake major structures and assemblies, while smaller firms provide machining, tooling, testing, precision parts and specialist services. Engineering companies can contribute modelling, design support, software and technical documentation.

## *The role of small and medium-sized enterprises*

The long-term strength of an aerospace manufacturing ecosystem depends on more than its largest suppliers. International production programmes require networks of smaller companies that can provide specialist components, materials, tools, services and secondary operations.



For India's MSMEs, aerospace offers access to technically demanding markets and potentially long production relationships. However, entry barriers can be substantial. Aerospace customers may require investment in certified processes, calibrated measurement systems, trained quality personnel, traceability and documentation. Qualification can take time, while orders may initially be too small to fully utilise expensive equipment.

Working capital is another concern. A smaller supplier may need to purchase materials, maintain inventory and fund production well before receiving payment. If customer acceptance is delayed or a production schedule changes, the financial effect can be severe.

The answer is not to encourage every engineering business to enter aerospace immediately. It is to help suitable firms understand the requirements and build realistic entry plans. Some companies may begin with tooling, non-flight-critical parts, secondary processes or engineering services before expanding into more demanding work, subject to the relevant customer and regulatory approvals.

Large manufacturers can support this process by providing clearer supplier-development pathways, technical guidance and realistic forecasts where commercially possible. Industry associations and training institutions can help small businesses understand aerospace quality expectations and prepare for audits.

The government has identified aircraft component manufacturing as an area requiring coordinated development. In February 2025, the Ministry of Civil Aviation convened industry and government stakeholders to discuss a roadmap for strengthening domestic component manufacturing and international competitiveness.

## *Beyond civil aviation: defence and specialised manufacturing*

India's defence aerospace sector provides another route for developing advanced manufacturing capabilities. Military aircraft, helicopters, transport aircraft, unmanned systems and associated equipment require structures, components, electronics, materials and specialist engineering services. Some capabilities developed for defence applications may be relevant to civil aerospace, although each application has its own requirements and approval processes.

The growth of domestic defence production and exports has increased the importance of industrial capacity. The Ministry of Defence reported record defence production of ₹1.27 lakh crore in financial year 2023–24 and defence exports of ₹23,622 crore in financial year 2024–25. These figures relate to the wider defence sector, not exclusively to aerospace, so they should not be presented as aircraft-component export values.

However, defence and civil aviation markets are not interchangeable. Military procurement may involve classified information, security restrictions, different standards and procurement structures. Civil aviation products must satisfy stringent airworthiness and production requirements associated with their intended use. A company cannot assume that experience in one sector automatically qualifies it for the other.

Exporting defence-related products can also involve licensing, end-user restrictions and geopolitical considerations. Companies need compliance systems capable of handling these obligations alongside their manufacturing responsibilities.

The strongest industrial strategy would allow

complementary capabilities to develop while respecting the distinct technical and regulatory demands of each market.

## *MRO and the wider aerospace ecosystem*

Manufacturing is only one part of aerospace industrial development. Maintenance, repair and overhaul (MRO), component repair, technical training, engineering services and spare-parts support can also create valuable domestic capabilities.

India's growing aircraft fleet provides a broader foundation for MRO demand. The Ministry of Civil Aviation has reported an increase in the number of MRO facilities in the country, from 96 in 2014 to 166 in 2025. It has also described policy measures intended to make the sector more competitive, including a uniform 5% IGST rate on specified imported aircraft parts, components, tools and testing equipment.

The relevance to aerospace manufacturing is direct. Local repair operations need parts, tooling, test equipment, technical documentation and specialist engineering support. In some cases, local component-repair expertise can reduce reliance on overseas facilities and improve turnaround time for operators.

Still, MRO can strengthen the wider ecosystem by developing skilled technicians, building relationships with original equipment manufacturers and encouraging investment in testing and engineering. It can also help create demand for local suppliers when procurement, certification and technical requirements permit.

An integrated approach to aerospace development should consider manufacturing, maintenance, training, logistics and engineering together. This helps businesses identify practical opportunities beyond the production of a single component.

## *The challenge of technology, capital and talent*

Despite the positive momentum, India must overcome several constraints if it is to increase its share of international aerospace manufacturing.

The first is capital. Aerospace production may require specialised machines, tooling, clean and controlled production environments, metrology equipment, non-destructive testing and dedicated quality systems. Investment decisions often need to be made before the business has secured enough recurring orders to generate an attractive return. Smaller companies are especially exposed when they invest for a prospective programme that is delayed or restructured.

The second challenge is technology. Access to a machine or production line does not automatically create expertise. Companies must understand how to optimise processes, control variation, inspect products and investigate failures. Some advanced materials and manufacturing processes also require close cooperation with material suppliers, research institutes and the customer.

A third constraint is talent. Aerospace production needs technicians, manufacturing engineers, quality specialists, materials experts, inspectors, programme managers and staff who understand configuration control and documentation. General engineering education provides a foundation, but workers often need additional industry-specific training.

Supply-chain resilience matters as well. A manufacturer may depend on imported aerospace-grade materials, specialised tools or production equipment with long lead times. Exchange-rate movements, shipping disruption or changes in international trade conditions can affect costs and delivery schedules. Suppliers must understand these dependencies and develop contingency plans where practical.

Finally, aerospace companies need realistic capacity planning. Orders can increase quickly when a programme ramps up, but adding shifts or purchasing equipment does not guarantee an immediate increase in accepted output. Additional production must be supported by qualified personnel, supplier availability, inspection capacity and customer approvals.

The central challenge is execution: building a production system that can deliver consistently, not just demonstrating that a component can be manufactured once.



## *What policy and industry must deliver*

Government support can improve the conditions in which aerospace companies invest, but it cannot substitute for industrial performance. A sustainable policy framework should support access to infrastructure, financing, specialised training, testing facilities and international market opportunities while maintaining clear safety and quality requirements.

India's policy approach has included measures to facilitate domestic component manufacturing and improve the competitiveness of MRO operations. Its broader task is to connect policy objectives with practical supplier requirements: which capabilities are missing, which investments are justified, and how can



domestic firms qualify for repeatable business?

Industry also has responsibilities. Global manufacturers need competitive suppliers, but local companies need credible demand signals before committing substantial resources. Where possible, structured supplier-development programmes can help bridge the gap between an Indian company's existing capabilities and the standards of a particular programme.

Research organisations and universities can contribute through materials research, manufacturing technology, testing and workforce development. Their work is most valuable when closely connected to industrial problems and when promising results can move beyond laboratory demonstrations into validated production.

Success should be assessed through concrete outcomes: greater domestic value addition, repeat export orders, improved productivity, more technically complex work, stronger supplier resilience and the development of capabilities that remain useful across programmes.

### *A realistic route to global leadership*

India does not need to manufacture every aircraft component or replicate the entire aerospace ecosystem of another country to become more influential in global aerospace. It needs to build a competitive set of capabilities, develop reliable companies and deepen its participation in international programmes.

This will take time. Aerospace qualification cycles are demanding, established suppliers have years of operational experience, and programme decisions are influenced by cost, technical performance, production capacity and long-term commercial considerations. Global sourcing is also competitive: other manufacturing countries are investing in their own aerospace capabilities.

The opportunity for Indian companies is to compete where they can demonstrate a clear advantage and then use successful delivery records to secure more technically demanding work. That may mean specialising in composites, high-precision components, aircraft structures, engineering services, MRO or other defined areas rather than pursuing every segment simultaneously. India's next aerospace manufacturing phase will be determined less by ambition alone than by the performance of its factories, engineers and supply chains.

The goal is not simply to manufacture more components in India. It is to ensure that components made in India meet the expectations of global programmes consistently, that domestic companies develop deeper technical expertise, and that international customers see them as reliable long-term partners.

From India to the world is not just a headline. It is a long-term industrial objective—one that will be earned through quality, engineering, investment and delivery, programme after programme.



## Transforming Aviation Training Through

# SIMULATION AND DIGITAL TWINS

*In this exclusive interview with Sundeep Mehta, Editor, Aviation Insights, Payal Gupta discusses how simulation-based training, AI, Virtual Reality, and Digital Twins are transforming aviation workforce development, enhancing operational safety, improving airport efficiency, and preparing the industry for the next generation of airside operations.*



## Payal Gupta

### Co-founder & Director – Business Development, Tecknotrove Systems

**Q** **Tecknotrove has been delivering simulation-based training solutions for over 25 years. How have you seen aviation training evolve during this period, and what role has simulation played in enhancing operational safety and workforce readiness?**

**A** Aviation has long used simulation for pilot training, but airside operations were still largely learned live on the apron on real equipment, under pressure, with little room for error.

Tecknotrove changed this by developing hardware-accurate GSE simulators with immersive virtual environments that recreate real apron layouts, aircraft movement, lighting, markings, signage, and traffic conditions in a safe, controlled setting.

This helped shift the industry mindset.




*"Simulation-based training is no longer a nice-to-have for airside operations—it is becoming the industry standard for building safer, more efficient aviation workforces."*

Airports gained safer, more consistent training; airlines saw better-prepared crews, fewer incidents, and faster turnarounds; and operators could upskill faster while reducing equipment damage and practicing high-risk scenarios without live operational risk.

Twenty-five years on, simulation-based training is no longer a nice-to-have for airside operations; it is becoming the standard. That shift from "pilots only" to the wider ground operations ecosystem is one of the changes we are proud to have been part of.

With airports and airlines under constant pressure to improve turnaround times while maintaining the highest safety standards, how can advanced simulation technologies help bridge the industry's skills gap and reduce operational risks

Turnaround time and safety are often seen as competing priorities, but they are closely connected. Most apron delays and incidents stem from undertrained personnel operating high-stakes equipment under time pressure.

Advanced simulation helps bridge this gap by allowing operators to build muscle memory and decision-making skills for high-pressure scenarios, equipment malfunctions, and adverse weather without the cost or risk of live training on the tarmac.

Our simulators combine hardware realism with detailed software environments covering narrow-body and wide-body aircraft, so operators train on the configurations they will actually encounter. For example, our aircraft pushback simulator trains up to five operators in a single scene, helping teams practice real-time coordination before they are on the ramp.

We also offer aircraft inspection modules that help line maintenance teams practice walkaround checks and identify whether an aircraft is safe to fly.This combination of realism, coordination, and procedural precision helps improve turnaround performance without compromising safety.

Digital transformation is reshaping aviation training through technologies such as Virtual Reality (VR), Artificial Intelligence (AI), and Digital Twins. Which of these

**Q innovations do you believe will have the greatest impact over the next five years, and why?**

A VR is already mature and delivering strong results where training is experience-based and non-critical. Over the next five years, I believe AI and Digital Twins will have the greatest impact on aviation training.

Digital Twins are especially valuable for MRO because they replicate real aircraft systems and operational data, allowing technicians to train on realistic faults such as engine wear or hydraulic issues without using actual aircraft. At Tecknotrove, we are combining Digital Twins with VR and simulation to create training environments that evolve with the aircraft, helping engineering, maintenance, and planning teams work from one synchronized model.

AI acts as the multiplier. It personalizes training paths, identifies weak areas early, generates adaptive simulator scenarios, supports real-time analytics, and helps automate evaluation and debriefing. It also speeds up content creation and updates as aircraft systems and regulations change.

In short, Digital Twins provide the realistic, data-driven training foundation, while AI makes that foundation adaptive, predictive, and continuously improving.

**Q Tecknotrove has developed simulators for a wide range of airside operations, from aircraft ground handling to emergency response. What are the most common training challenges faced by aviation organizations today, and how can simulation effectively address them?**

**A** Tecknotrove addresses a major vulnerability in high-density aviation hubs such as Delhi, Mumbai, Doha, Dubai, and Riyadh where runway incursions and ground collisions stem from coordination gaps and lack of edge-case practice rather than individual skill deficits. By deploying airport-specific digital twins that replicate exact airside layouts, signage, and traffic dynamics,

Tecknotrove enables ground crews, ATC, and emergency teams to conduct joint, realistic training for high-risk scenarios without exposing assets to hazard. This tailored operational rehearsal drives measurably higher procedural retention, directly mitigating costly ground damage, reducing turnaround bottlenecks, and lowering overall operational risk.

**Q As airports expand and automation increases, training requirements are becoming more complex. How do you ensure that your simulation solutions remain scalable, customizable, and aligned with evolving international aviation standards?**

**A** Tecknotrove delivers scalable, future-ready simulation platforms engineered on a modular architecture that expands alongside airport growth such as new terminals, fleet additions, or ground equipment without requiring a complete system rebuild.




By incorporating ICAO standards and an airport's specific airside layouts, operational SOPs, and edge cases, Tecknotrove builds high-precision digital twins rather than relying on generic templates. Driven by an in-house R&D team integrating AI analytics and operational feedback, these simulators evolve continuously with regulatory changes and automation trends, ensuring long-term operational relevance and precision training.

**Q Sustainability has become a strategic priority for the aviation industry. Beyond improving safety, how can simulation-based training contribute to reducing operational costs, equipment wears and tear, fuel consumption, and the environmental impact of airport operations?**

**A** Tecknotrove's simulation-based training delivers a significant sustainability dividend by replacing live equipment exercises with digital rehearsals for high-risk ground handling, pushback, and emergency procedures. Shifting this practice to simulators cuts fuel burn, lowers carbon emissions, and eliminates unnecessary mechanical wear and tear on ground support equipment and aircraft assets.

By allowing teams to repeatedly rehearse complex manoeuvres and fail safely in a virtual environment, airports extend equipment lifecycles, reduce maintenance costs, and achieve superior workforce readiness without the environmental and resource drain of live field training.

Beyond training itself, the same digital twin data we use for simulation can inform smarter ground operations, optimizing taxi routes, reducing idle time, and minimizing unnecessary vehicle movement. So, simulation isn't just safer, it's a quieter, lower-emission way to build operational excellence, which is exactly the kind of measurable sustainability impact the industry is now expected to show

**Q Looking ahead, what is your vision for the future of aviation simulation and training, and what advice would you offer to airports, airlines, MROs, and aviation training institutions planning to invest in next-generation training technologies?**

**A** The future of aviation training requires elevating ground handling from a secondary budget item to core infrastructure, closing the dangerous gap between heavy flight-deck investment and high-risk airside operations. Because ground support equipment (GSE) errors drive the majority of daily delays, damage, and safety incidents, investing in simulation delivers a compelling financial ROI by protecting turnaround times and operational margins.

Ultimately, ground training will evolve into fully connected digital twin ecosystems linking ATC, emergency response, and flight operations through live airport data enabling early adopting hubs to operate safer, leaner, and far more profitably.

# "FROM INDIA TO THE WORLD: BUILDING AEROSPACE AND DEFENCE CAPABILITIES FOR THE FUTURE"

*In Conversation with Pavan G. Ranga, MD & CEO, Rangsons Aerospace With Sundeep Mehta - Editor, Aviation Insights*



## Pavan G. Ranga

**MD & CEO, Rangsons Aerospace**

**Q** **Rangsons Aerospace has evolved across aerospace manufacturing, engineering, defence, space and mission-critical technologies. How would you describe the company's current phase of growth, and what are the key areas you are prioritising over the next three to five years?**

**A** Rangsons Aerospace is at an important phase in its evolution, moving from being primarily focused on manufacturing capabilities to building a broader and deeper aerospace and defence technology ecosystem. Our focus is on strengthening our engineering and manufacturing capabilities, developing technology-led solutions and building the competencies required to participate in increasingly complex and mission-critical programmes.

Over the next three to five years, we will continue to invest in advanced manufacturing, engineering, testing and qualification capabilities,



*"India has a significant opportunity to move from being a cost-competitive manufacturing destination to becoming a trusted engineering and technology partner for the global aerospace industry."*

while also expanding our presence across aerospace, defence, space and related technology segments. A key priority will be building capabilities that enable us to participate in programmes across the value chain and create long-term partnerships with both Indian and global customers.

**Q India's aerospace industry is increasingly moving from component manufacturing toward higher-value engineering, systems and technology development. Where do you see the biggest opportunities for Indian companies to move up the aerospace value chain?**

**A** India has a significant opportunity to move from being a cost-competitive manufacturing destination to becoming a trusted engineering and technology partner for the global aerospace industry. The opportunity extends across design and engineering, precision manufacturing, systems integration, testing, certification and lifecycle support.

The growing domestic aerospace and defence ecosystem, combined with the increasing interest of global OEMs in diversifying their supply chains, creates a strong foundation for this transition. To move up the value chain, Indian companies will need to combine manufacturing excellence with engineering depth, intellectual property, quality systems and the ability to deliver consistently to global standards.

**Q Rangsons has been involved in demanding programmes across aerospace and space. What have these programmes taught the organisation about engineering, qualification, testing and manufacturing to international standards?**

**A** Mission-critical aerospace and space programmes leave very little room for compromise. They have reinforced for us that engineering excellence is not only about designing a product; it is about ensuring repeatability, reliability, traceability and performance throughout the entire lifecycle.

These programmes have strengthened our understanding of stringent qualification requirements, testing protocols, documentation, process discipline and quality assurance. They have also reinforced the importance of building engineering and manufacturing processes that are robust from the beginning rather than relying on inspection at the end of the process.

**Q Global aerospace OEMs are looking to diversify and strengthen their supply chains. What capabilities must Indian aerospace companies develop to become long-term global programme partners rather than simply cost-competitive suppliers?**

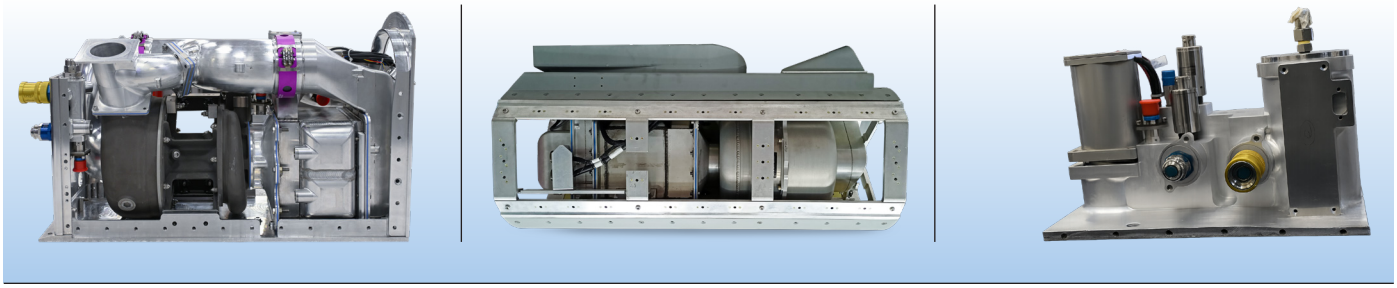
**A** Cost competitiveness will always be relevant, but it cannot be the only differentiator. Long-term programme partnerships are built on quality, reliability, engineering capability, delivery performance and the ability to continuously improve.

Indian aerospace companies need to develop strong programme management capabilities, robust quality and certification systems, advanced manufacturing infrastructure, engineering talent and the ability to support customers over long programme lifecycles. Equally important is the ability to understand a customer's requirements and take ownership of outcomes rather than simply delivering to a drawing or purchase order.

**Q Rangsons is working across areas including tactical communications, EW, SATCOM and mission-critical technologies. How do you see the convergence of aerospace, defence electronics, secure communications and software changing the products and systems India will need in the coming decade?**

**A** The boundaries between aerospace, defence electronics, communications and software are becoming increasingly interconnected. Future platforms will depend not only on their physical structures and propulsion systems but also on secure communications, sensing, data processing, connectivity and software-driven capabilities.

This convergence will create demand for integrated and interoperable systems that can operate reliably in complex and contested environments. For India, it also creates an



opportunity to develop indigenous capabilities across hardware, electronics, communications and software, reducing dependence on external technologies while creating solutions suited to our own operational requirements.

**Q With the rapid growth of drones and unmanned systems, what opportunities do you see for Rangsons Aerospace in areas such as communications, avionics, mission systems and other critical technologies supporting next-generation unmanned platforms?**

**A** Unmanned systems are likely to become an increasingly important part of both defence and civilian aerospace applications. Their effectiveness, however, depends on a range of underlying technologies including reliable communications, avionics, navigation, mission systems and secure data links.

Our focus is on building capabilities in these critical technology areas that can support the broader unmanned systems ecosystem. We see opportunities not only in complete platforms but also in the technologies and subsystems that enable these platforms to operate safely, securely and effectively.

**Q Aerospace programmes require significant investment in advanced manufacturing, testing, certification and skilled engineering talent. What are the biggest challenges facing Indian aerospace companies as they scale, and where does the industry need greater ecosystem support?**

**A** Scaling aerospace capabilities requires patience and sustained investment. Unlike many other industries, aerospace involves long development cycles, stringent qualification requirements and significant investments in specialised equipment, testing infrastructure and skilled manpower.

*"By 2030, we would like Rangsons Aerospace to be recognised as a trusted Indian aerospace and defence technology partner with strong engineering, manufacturing and systems capabilities, serving both Indian and global programmes."*

One of the biggest requirements is therefore the development of a deeper aerospace talent pool across engineering, manufacturing, quality, certification and programme management. Greater collaboration between industry, academia, research institutions and government can help accelerate this development. A stronger supplier ecosystem, access to advanced testing infrastructure and continued support for indigenous technology development will also be important.

**Q Rangsons has been building capabilities that serve both Indian and international markets. How important will exports become to the company's growth strategy, and which international aerospace markets or programme segments do you see as particularly relevant?**

**A** Exports will be an important part of our long-term growth strategy. India's aerospace ecosystem is increasingly integrated into global supply chains, and Indian companies have an opportunity to establish themselves as reliable partners for international programmes.

Rather than looking at exports only in terms of geography, we see the opportunity in terms of programme segments where our engineering, manufacturing and technology capabilities can create long-term value. Our objective is to build globally competitive capabilities that allow us to participate in international programmes while continuing to contribute to India's strategic and domestic requirements.

**Q Looking toward 2030, what would you like Rangsons Aerospace to represent in the global aerospace industry, and what capabilities or investments will be critical to achieving that ambition?**

**A** By 2030, we would like Rangsons Aerospace to be recognised as a trusted Indian aerospace and defence technology partner with strong engineering, manufacturing and systems capabilities, serving both Indian and global programmes.

Achieving this will require sustained investment in advanced manufacturing, engineering talent, testing and qualification infrastructure, technology development and digital capabilities. Most importantly, we want to build an organisation where innovation and quality are embedded into the way we work. Our larger ambition is to contribute to the development of a stronger Indian aerospace and defence ecosystem—one that is globally competitive, technology-driven and capable of delivering mission-critical solutions from India to the world.

# INDIA'S AVIATION FUTURE BY 2035: INTEGRATING HELICOPTERS, SEAPLANES AND EVTOLS

*Aviation Insights Editor Sundeep Mehta in conversation with Prof. Dr. Sanjay Kumar, h.c., former Executive Director and Offg. CMD (as assigned) of Pawan Hans Ltd., now Professor and Chair Head of Aviation Management at Graphic Era (Deemed to be*

| 38 | 29 | 34 | 02 | 20 | 06 |
|---|---|---|---|---|---|
| YEARS ACROSS AUTO, AVIATION | YEARS AT PAWAN HANS | HELICOPTERS INDUCTED ON | PATENTS PUBLISHED | GLOBAL CERTIFICATIONS | BOOKS AUTHORED & |



## Prof. Dr. Sanjay Kumar, h.c.

**Professor & Chair Head, Aviation Management**

**Graphic Era (Deemed to be University), Dehradun**

**Former ED & Offg. CMD (as assigned), Pawan Hans Ltd.**

**Co-Founder, AviatelQ Tech LLP • IICA Certified Independent Director**

**Q You pioneered India's first integrated heliport at Rohini, Delhi, and launched the country's first seaplane services in the Andaman & Nicobar Islands. How did those firsts reshape India's approach to rotary wing and amphibious aviation?**

**A** Rohini was proof that India could build dedicated vertical lift infrastructure inside a metropolitan environment, with air traffic management, passenger handling and night operations under a single regulatory roof.

Before it, helicopter movements in our cities were scattered across temporary landing sites. Rohini made the heliport a legitimate node in the national air transport network, and that blueprint still shapes vertiport planning today.

The Andaman seaplanes answered a different question: how to give island territories last-mile access where a runway is not practical. Budget 2026 now carries seaplane manufacturing incentives and a VGF scheme, and UDAN 5.5 has invited bids for over 50 water bodies.

**Q India's helicopter fleet is projected to cross 1,000 aircraft in the next decade, yet civilian operations remain constrained. What structural reforms are needed?**

**A** India is the only major economy where civilian helicopter operations are significantly underserved relative to its geography.

During my 29 years at Pawan Hans I watched rules written for fixed-wing aircraft applied unchanged to rotary-wing operations.

HeliSewa and enhanced VGF under UDAN 5.1/5.2 are welcome, but three deeper reforms remain pending: a dedicated regulatory sub-framework for lower-altitude corridors and simplified helipad approvals; an accelerated heliport pipeline for a market worth close to USD 4 billion; and HEMS operationalised at scale. Industry has moved — Tata-Airbus H125 assembly line and HAL Dhruv NG — policy must now match it.

> *"Today's India must not treat Advanced Air Mobility as a greenfield exercise when it already holds a brownfield advantage in existing helicopter infrastructure."*

## THE FIRSTS LEDGER

**01**
**First Integrated Heliport**
Rohini, Delhi. ATM, passenger handling and night operations under one roof.

**02**
**First Seaplane Services**
Andaman & Nicobar, with regular helicopter passenger services from 2003.

**03**
**The Pilgrimage Network**
Kedarnath, Vaishno Devi and Amarnath Ji connected under UDAN.

**04**
**Antarctic Expeditions**
The only Indian operator to win and complete the contracts in successive seasons.

**06**
**New Types into India**
Dauphin AS365 N3, H125 and Bell 407 brought into the Indian fleet first.

**07**
**Daman & Diu Service, 2018**
Inaugurated by the Prime Minister, alongside heliport development across Uttarakhand, Assam, Arunachal Pradesh and Himachal Pradesh.

**Q How do you see heli tourism and heli pilgrimage evolving as a mainstream mobility segment?**

**A** Heli pilgrimage is the most convincing demonstration of helicopter utility for the ordinary Indian traveller. Connecting Kedarnath, Vaishno Devi and Amarnath Ji showed helicopters are essential mobility where roads are seasonal or absent. Heritage Aviation's additional Airbus H130 at Wings India 2026 and Northeast interest signal expansion. The next phase is broader heli tourism — Himalayan corridors, cultural circuits, coastal routes — eventually integrated with the eVTOL network. Through the HO-GEM framework I have argued for rationalised GST so heli tourism reaches middle-income travellers, not only premium segments.

**Q With eVTOL trials planned for Delhi, Mumbai and Pune, how prepared is India for Advanced Air Mobility?**

**A** Promising but realistic: DGCA vertiport advisory, eVTOL airworthiness guidance and ICAO submission are groundwork, with Sarla Aviation, ePlane Company and InterGlobe-Archer pushing commercialisation. We still need infrastructure, airspace integration and a trained workforce. India already operates heliports — retrofit them rather than build from scratch. That is precisely what AHDTCAO enables. I have also proposed a Centre of Excellence in Advanced Air Mobility and Aviation Digital Twins.

**Q What is your vision for India's aviation mobility roadmap by 2035?**

**A** A truly multimodal ecosystem where fixed-wing airlines, helicopters, seaplanes, eVTOLs and cargo drones function as one network. UDAN laid the foundation (650+ routes, 93 airports including heliports and water aerodromes). The next phase needs infrastructure convergence, indigenous manufacturing (Tata-Airbus H125, domestic eVTOLs), and human capital — the shift we are least prepared for. That is the mission I now pursue: bridging three decades of industry experience with academic innovation.




> *Today's India must not treat Advanced Air Mobility as a greenfield exercise when it already holds a brownfield advantage in existing helicopter infrastructure.*

## SIX FRAMEWORKS ON THE TABLE

RESEARCH

**VertiNet 2040**

National vertical mobility network binding heliports, vertiports and drone corridors through one digital layer.

**HeliNet-AI**

Deep reinforcement learning for terrain-aware, demand-responsive heliport site selection.

**UAM-ERI**

Scores city readiness across regulatory, infrastructure, technology and social acceptance.

**AHDTCAO**

Autonomous heliport digital twin. Patent published October 2026.

**ATIC**

Tests whether training capacity is growing as fast as terminals, heliports and fleets to 2047.

**HO-GEM**

Rationalised GST treatment to make heli tourism viable beyond premium segments.

### CURRENT ROLES

- Professor & Chair Head, Aviation Management, Graphic Era University, Dehradun
- Co-Founder, AviatelQ Tech LLP
- Advisory Board, BelAir Group
- IICA Certified Independent Director

### INDUSTRY RECORD

- 29 years at Pawan Hans Ltd., rising to ED & Offg. CMD
- Accountable Manager, DGCA
- GM Western, Northern & Eastern Regions; Head of Heliports
- MoCA Nodal Person, B.Sc. Aeronautical Engineering, RGNAU

### BOOKS, HONOURS & CONTACT

- The Sky Is Public • No Runway? No Problem. • Coffee, Contracts & Courtesy
- Pioneer in Aviation Education Award, EFI, 2026
- www.aviationsanjay.com • sanjay@aviationsanjay.com
- ORCID 0009-0005-4583-8557

# AAR Adds Three Heavy Maintenance Lines at Miami MRO Facility

AAR has expanded its aircraft maintenance operations in Miami by adding three heavy maintenance lines, increasing its capacity to serve commercial aviation customers.

The expansion adds approximately 200,000 square feet of operational space at the Miami facility. The additional capacity is intended to accommodate more aircraft and provide greater flexibility for heavy maintenance work, including scheduled and unscheduled requirements.

AAR's investment comes as airlines continue to seek reliable maintenance, repair and overhaul providers amid high aircraft utilisation, supply-chain constraints and pressure on available maintenance capacity. The Miami facility serves an important market and supports customers across North and Latin America.



The additional lines are expected to improve aircraft throughput and allow AAR to handle a larger volume of maintenance work across different aircraft types and programmes. For operators, more available capacity at a strategically located facility can provide additional options when planning major checks and managing aircraft downtime.

The expansion strengthens AAR's position in the US MRO market and forms part of its wider maintenance-network development.

# COLLINS AEROSPACE SUPPORTS US ARMY CHINOOK HELICOPTER MODERNISATION



Collins Aerospace is supporting the modernisation of the US Army's CH-47 Chinook fleet through upgrades to aircraft systems and engineering support intended to sustain the helicopter's operational capability.

The work forms part of wider efforts to improve the reliability, maintainability and service life of the heavy-lift platform as mission requirements and technology continue to evolve. Collins Aerospace has a longstanding role in the Chinook programme, supplying systems and components and helping integrate newer technologies while maintaining compatibility with the existing aircraft.

The Chinook is used for troop transport, equipment movement, humanitarian assistance and other operations requiring heavy-lift capability. Modernisation allows the US Army to retain this established platform while addressing changing operational needs.

For Collins Aerospace, the work reinforces its role in supporting military aircraft throughout their lifecycle. The effort also illustrates how targeted upgrades can help extend the usefulness of mature platforms rather than requiring immediate replacement.

Continued cooperation between the Army and its suppliers will be important as the Chinook fleet is adapted for future missions.

# HAECO AND CALC PLAN HONG KONG AIRCRAFT ENGINE SUPPORT PLATFORM




HAECO Group and China Aircraft Leasing Group Holdings (CALC) plan to establish an aircraft engine support platform in Hong Kong, bringing maintenance expertise and aircraft asset-management capabilities closer together.

The proposed platform is expected to provide engine-related services for aircraft operated or managed within CALC's portfolio, including maintenance, repair and overhaul and other lifecycle support. HAECO will contribute its engineering and maintenance capabilities, while CALC will bring its aircraft leasing and asset-management experience.

The initiative could help CALC manage engine support across its aircraft portfolio and give HAECO an opportunity to expand its engine-related business. It also reflects the growing connection between aircraft leasing, engine asset management and maintenance services.

The companies expect Hong Kong to play a central role in the proposed operation, potentially reinforcing the city's position as a regional aviation services hub. The platform remains a planned initiative, with its value depending on implementation and the services ultimately offered.

# StandardAero Expands Bombardier Global Airframe Maintenance in Van Nuys

StandardAero has expanded its maintenance capabilities for Bombardier Global business jets at its Van Nuys facility in California, adding airframe services for operators in the western United States.

The new capability broadens the support available to Global aircraft owners and operators at the site. Services are expected to address scheduled and unscheduled airframe maintenance, giving customers another regional option for managing aircraft checks and reducing the logistical burden of travelling to distant facilities.

The expansion comes as business aviation




operators continue to require specialised maintenance for large-cabin aircraft used in corporate, private and charter operations. MRO providers are increasingly developing broader service portfolios to meet customer demand for convenient, integrated support.

StandardAero already serves business aviation customers with a range of maintenance, repair and overhaul services. Adding Bombardier Global airframe capability strengthens its offering and supports closer relationships with operators of the aircraft family.

The development reinforces Van Nuys as a maintenance location for business aviation in California, while giving Global operators additional flexibility in planning aircraft downtime.

## AFI KLM E&M and Air Corsica Expand LEAP-1A Engine Support Agreement




Air France Industries KLM Engineering & Maintenance (AFI KLM E&M) and Air Corsica have signed a multi-year agreement covering support for nine LEAP-1A engines used by the airline's Airbus A320neo fleet.

The agreement extends a relationship that has continued for several decades. AFI KLM E&M already provides CFM56-5B engine maintenance and component support for Air Corsica's Airbus A320ceo and A320neo aircraft. The new contract expands that support to the airline's next-generation LEAP-1A engines.

The arrangement is intended to help Air Corsica maintain engine reliability, aircraft availability and operational performance throughout the contract period. It also strengthens AFI KLM E&M's position in the growing LEAP engine maintenance market.

For airlines operating newer aircraft, dependable engine support is important to managing fleet utilisation and maintenance planning. The agreement combines AFI KLM E&M's engine maintenance experience with its established relationship with Air Corsica, extending cooperation to another engine type in the airline's fleet.

## AFI KLM E&M Signs Long-Term Component Support Agreement for Malaysia Airlines A350 Fleet

Air France Industries KLM Engineering & Maintenance (AFI KLM E&M) has signed a long-term agreement to provide component support for Malaysia Airlines Berhad's Airbus A350 fleet.

The contract builds on the companies' existing relationship, which includes component support for Malaysia Airlines' Boeing 737 aircraft. Under the new agreement, AFI KLM E&M will provide support tailored to the operational requirements of the airline's A350 aircraft, helping maintain availability and operational performance.

AFI KLM E&M brings experience from Air France's own A350 operations and from supporting other A350 operators internationally. The company says this combination of airline operating experience and maintenance expertise will help it align component services with Malaysia Airlines' needs.

Malaysia Airlines said reliable and responsive component support is important as it operates a fleet of newer-generation aircraft and works to improve operational efficiency.

The agreement extends cooperation between the companies and provides a long-term framework for component support, reinforcing the importance of dependable maintenance arrangements for widebody fleet operations.



# Boeing and American Airlines Complete First 737 MAX Landing Gear Exchange

Boeing and American Airlines have completed the first landing gear exchange for a 737 MAX, extending Boeing's Landing Gear Exchange Program to the aircraft family.

Under the programme, Boeing supplied overhauled and certified main and nose landing gear assemblies with an installation kit. The exchange model allows an airline to receive assemblies ready for installation instead of waiting for its own landing gear to complete an in-place overhaul. Wheels, tyres and brakes were excluded from the supplied assemblies.

The approach is designed to reduce aircraft-on-ground time and limit the need for airlines to hold expensive spare landing gear inventory. Boeing manages the overhaul, applicable service-bulletin incorporation, certification and supplier coordination.




Boeing is also working to increase global overhaul capacity and improve the availability of exchange inventory for 737 MAX operators. Planned priorities include additional exchange slots closer to customer operations and tracking performance to assess effects on downtime and costs.

The first completed exchange demonstrates how component-exchange services can give airlines another option for managing heavy maintenance and improving fleet planning.

# CHINA AIRLINES SELECTS SAFRAN FOR A350-900 LANDING GEAR OVERHAUL



China Airlines has signed an agreement with Safran Landing Systems for overhaul of the main landing gear on its fleet of 18 Airbus A350-900 aircraft.

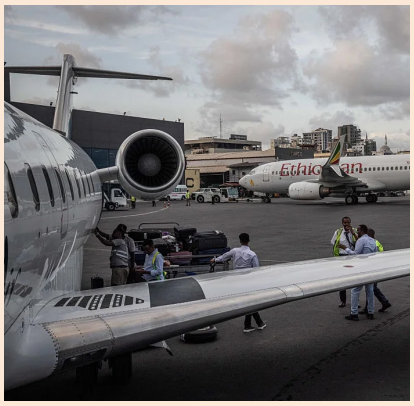
The contract covers maintenance support from 2026 through 2031. Overhaul and associated technical support will be provided at Safran Landing Systems' MRO centre in Singapore, drawing on the company's original equipment manufacturer expertise and landing gear maintenance capabilities.

The agreement extends an existing relationship between the two companies. China Airlines already uses Safran for landing gear maintenance on its Airbus A330 fleet, while other carriers within the CAL Group, including Tigerair Taiwan and Mandarin Airlines, also work with Safran Landing Systems.

Landing gear maintenance is a critical part of aircraft lifecycle support, helping operators maintain reliability, availability and performance. The new agreement gives China Airlines a long-term framework for supporting the A350-900 fleet and strengthens Safran's role in the airline's maintenance planning.

The contract also underlines the importance of regional MRO facilities in Singapore in serving airlines across the Asia-Pacific market.

# Drukair Selects CFM LEAP-1A Engines for Five Airbus A320neo Family Aircraft



Drukair, Royal Bhutan Airlines, has selected CFM International LEAP-1A engines to power five Airbus A320neo family aircraft: three A320neo and two A321XLR jets announced by the airline in 2024.

The engine selection supports Drukair's plans to expand its fleet and strengthen connectivity across Asia. Chief Executive Officer Tandi Wangchuk said the engines' efficiency and reliability would support the airline's next phase of growth and help deliver value to passengers.

Drukair has been a CFM customer since 2004, when it received its first CFM56-powered Airbus A319ceo. Its current fleet includes one LEAP-powered A320neo alongside three A319ceo aircraft equipped with CFM56 engines.

CFM International said it would continue supporting the airline as LEAP-powered aircraft enter service. The company reports that more than 10,000 LEAP engines have been delivered and is developing improvements intended to increase durability and time on wing.

The selection extends a longstanding customer relationship and provides propulsion support for Drukair's planned A320neo family fleet.

# HAL and Safran Sign Contract to Develop Aravalli Helicopter Engine

Hindustan Aeronautics Limited (HAL) and Safran Helicopter Engines have signed an agreement through their joint venture, SAFHAL Helicopter Engines, to develop the Aravalli, a new-generation helicopter engine designed for India's future medium-lift rotorcraft.

The engine is planned for the 3,500–4,000 shaft horsepower class and will power HAL's 13-tonne Indian Multi-Role Helicopter (IMRH) and its naval version, the Deck-Based Multi-Role Helicopter (DBMRH).

The programme will cover engine development, manufacturing and lifecycle support. By combining HAL's aircraft



development and production expertise with Safran's helicopter-engine technology, the partnership aims to strengthen India's domestic aerospace propulsion capabilities and reduce dependence on imported engines.

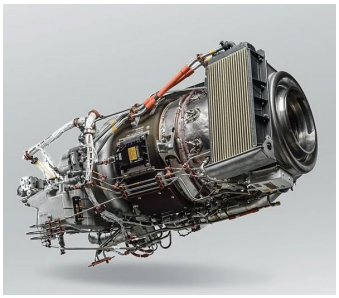
The companies are also considering possible future applications in civil roles, including offshore transport, utility missions and VIP travel. Local manufacturing and potential maintenance, repair and overhaul capabilities could create opportunities for Indian suppliers and service providers. The Aravalli programme builds on HAL and Safran's longstanding cooperation in the helicopter sector. Its progress will be closely linked to the IMRH and DBMRH programmes and could support a broader Indian ecosystem for helicopter production, propulsion and long-term support.

## Honeywell to Provide Three-Year APU Maintenance Support for Garuda Indonesia

Honeywell Aerospace has signed a three-year agreement with Garuda Indonesia to provide repair and maintenance services for its 131-9B, 331-350 and 331-500 auxiliary power unit (APU) models.

The agreement establishes a multi-year framework for APU support and is intended to give the airline more predictable repair costs and clearer service expectations. These arrangements can help operators plan maintenance requirements and manage aircraft readiness over the contract period.

APUs provide electrical power and conditioned air while an aircraft is on the ground, supporting cabin and aircraft systems during boarding and turnaround. Reliable APU performance therefore contributes to efficient ground operations and aircraft availability.



Honeywell said the contract builds on its longstanding relationship with Garuda Indonesia. The company supports airlines through repair, overhaul and upgrade services, backed by a global network of repair and overhaul facilities and commercial aviation channel partners.

For Garuda Indonesia, the agreement supports efforts to improve operational reliability as the airline continues its transformation. The contract also reinforces Honeywell's aftermarket support presence in Indonesia and the wider Asia-Pacific region.

## Japan Airlines Renews Embraer Pool Program Support for E-Jets

Embraer and Japan Airlines (JAL) have renewed their long-standing partnership through a multi-year agreement under Embraer's Pool Program, covering maintenance and spare-parts support for 32 E170 and E190 aircraft.

The agreement provides access to repairable components and places inventory close to JAL's operations, helping the airline obtain critical parts more quickly and reduce the risk of service disruption. The programme is designed to support component availability and improve fleet reliability.

The E-Jets have been an important part of J-Air's operations since 2008, supporting regional connectivity across Japan. JAL said the renewed agreement reinforces its focus on safety, dependable component supply and operational performance. The airline reported a six-month service reliability average of 99.8% for its E-Jets.

For Embraer, the renewal continues a relationship with a major regional aircraft operator. The company says its Pool Program is designed to provide responsive support and help customers maintain aircraft performance.

The agreement highlights the role of component pooling and nearby spare-parts inventory in supporting regional fleets and reducing maintenance-related disruptions.






# Jazeera Airways Selects LEAP-1A Engines for Nine More A320neo Aircraft

Jazeera Airways has selected CFM International LEAP-1A engines for nine additional Airbus A320neo aircraft and expanded its engine services agreement with CFM.

The revised agreement covers the airline's current and future fleet of 29 A320neo family aircraft and includes the purchase of spare engines. The arrangement is intended to support fleet expansion, engine availability and operational planning as Jazeera Airways develops its network.

The airline became the first LEAP-1A-powered A320neo operator in the Middle East in May 2018. It currently operates 11 A320neo aircraft powered by LEAP-1A engines, alongside 13 A320ceo aircraft equipped with CFM56-5B engines.

Jazeera Airways said the selection reflects continued confidence in CFM's engine technology and support. CFM said it would continue helping the airline maximise engine utilisation and fleet performance.

The expanded agreement links the airline's aircraft growth plans with long-term engine support and spare-engine availability, important factors in managing fleet reliability and operating costs. effectively.

# KOREAN AIR AND THAI AVIATION INDUSTRIES PARTNER ON MILITARY AIRCRAFT MRO




Korean Air has signed a teaming agreement with Thailand's state-owned Thai Aviation Industries (TAI) to cooperate on maintenance, repair and overhaul for Thai military aircraft, beginning with UH-60 Black Hawk helicopters operated by the Royal Thai Army.

The agreement was signed at Korean Air's Tech Center in Busan on September 2. Under the initial arrangement, the companies will work on depot-level maintenance and may extend cooperation to other aircraft operated by the Royal Thai Armed Forces. Korean Air will also support TAI in standardising maintenance processes and delivering technical training.

TAI manages maintenance and logistics support for aircraft operated by the Thai military. The partnership brings together Korean Air's military aircraft maintenance experience and TAI's local infrastructure, with the aim of improving fleet readiness in Thailand.

Korean Air says it has more than 50 years of military aircraft maintenance experience and has completed depot-level maintenance and performance upgrades for more than 5,500 aircraft. The agreement also creates an opportunity to expand cooperation in Southeast Asia's defence MRO market.

# MTU Maintenance Zhuhai Redelivers 100th PW1100G-JM Engine from Jinwan



MTU Maintenance Zhuhai has redelivered its 100th PW1100G-JM geared turbofan engine from its Jinwan site, reaching the milestone less than 18 months after the facility began operations in March 2025.

The PW1100G-JM powers aircraft in the Airbus A320 family. The Jinwan operation is part of MTU Maintenance Zhuhai, a joint venture between China Southern Airlines and MTU Aero Engines, and contributes to the global maintenance network supporting Pratt & Whitney's geared turbofan engines.

MTU said the site's ramp-up has been supported by operational processes intended to improve efficiency, reduce turnaround times and develop workforce skills. A dedicated training engine has helped employees qualify and gain practical experience, while expertise from other MTU locations and EME Aero in Poland supported the facility's development.

The company is now working towards its next milestone of 100 engine redeliveries in a shorter timeframe. The achievement reflects growing maintenance activity for the PW1100G-JM and the importance of expanding qualified MRO capacity as operators seek reliable engine support.

# POLAND ESTABLISHES APACHE SUPPORT INFRASTRUCTURE WITH BOEING PARTNERSHIP

Poland is strengthening its ability to maintain its AH-64E Apache helicopter fleet through new industrial agreements involving Wojskowe Zakłady Lotnicze Nr 1 (WZL-1), the Military Central Bureau of Design and Technology (WCBKT) and Boeing.

Under the offset implementation agreements, WZL-1 will provide maintenance, repair and overhaul services, including organisational- and intermediate-level inspections and repairs, alongside selected depot-level component work. Boeing will provide technical expertise, resources and training to personnel from WZL-1 and WCBKT to help develop the skills needed to sustain the helicopters in Poland.




The cooperation will also assess selected Polish-designed and manufactured WCBKT ground support equipment for potential use with the Apache.

Poland has contracted for 96 AH-64E helicopters and is set to become the world's second-largest Apache operator after the United States. WZL-1 is expected to establish Europe's largest Apache support infrastructure, strengthening domestic maintenance capacity and Polish industry participation in the programme.

## Boeing Selects Liebherr for 777-8 Freighter Brake Electronics



Boeing has selected Liebherr-Aerospace to develop and supply brake control and monitoring electronics for the 777-8 Freighter, extending Liebherr's role in the next-generation 777X aircraft family.

The equipment will support the freighter's braking-system control and monitoring functions. These systems are important to aircraft ground operations, particularly for a large cargo aircraft designed for long-range missions and high freight capacity.

The selection adds another Liebherr system to the 777X programme and builds on the company's experience supplying aircraft systems to commercial manufacturers. Brake electronics help monitor and control braking performance during landing and ground manoeuvring.

For Liebherr-Aerospace, the agreement reinforces its position as a systems supplier to Boeing's next-generation commercial aircraft portfolio. The 777-8 Freighter is being developed for cargo operators seeking long-range capability and substantial payload capacity.

As the aircraft programme progresses, suppliers will contribute specialised systems and components required to support its future entry into service.

## Jordan Airmotive Signs Five-Year Engine Maintenance Agreement with Tunisair

Jordan Airmotive has signed a five-year agreement with Tunisair to provide engine maintenance support, strengthening its business with the airline and its position in the regional engine maintenance market.

The contract will provide maintenance services for engines operated by Tunisair, supporting the carrier's fleet requirements and helping maintain engine reliability and availability. For the airline, a long-term arrangement can improve maintenance planning by providing access to specialised support over an extended period.



The agreement comes as airlines and maintenance providers face pressure from high aircraft utilisation, supply-chain constraints and limited availability across parts of the maintenance, repair and overhaul sector. Engine servicing is a critical part of fleet management, with operators seeking dependable providers and predictable turnaround times.

For Jordan Airmotive, the deal adds an international airline customer and provides greater visibility into future workloads. The agreement highlights the continuing role of regional engine MRO providers in supporting commercial fleets and expanding maintenance relationships across markets.

# Royal Brunei Airlines Signs Long-Term Collins Aerospace Support Contracts for Boeing 787 Fleet

Collins Aerospace has secured two 12-year contracts with Royal Brunei Airlines to provide FlightSense and Dispatch services for the airline's current and future Boeing 787 fleet.

The agreements cover support for systems including avionics, cargo, electrical power, environmental control and lighting. The services are designed to improve component availability, reduce downtime and make maintenance costs more predictable through a fixed-rate support model.



Collins will provide reliability-based maintenance, predictive support, asset and logistics services, and access to certified spare and repaired parts. The company says its connected data and global support network will help operators plan maintenance and improve system performance.

Royal Brunei Airlines said maintaining a reliable and efficient 787 fleet is a priority as it optimises operations and develops its network. The airline expects the agreements to support aircraft availability and reduce operational disruption.

The long-term contracts extend Collins Aerospace's aftermarket relationship with the airline and illustrate how integrated component support can help carriers manage maintenance planning and fleet reliability over the aircraft lifecycle.

## ST ENGINEERING AND COLLINS AEROSPACE EXPAND COMPONENT SUPPORT COOPERATION




ST Engineering's Commercial Aerospace business and Collins Aerospace have signed three multi-year agreements to expand component repair and spare-parts support for airline operators.

The agreements bring together Collins' original equipment manufacturing expertise and ST Engineering's maintenance, repair and overhaul capabilities. One new arrangement covers repairs to Collins fan assembly electronics boards used on the Boeing 787, with the aim of reducing repair turnaround times and supporting repair rather than replacement where appropriate.

The companies also expanded an agreement for procurement of Collins Power & Controls spare parts used in component MRO, adding more narrowbody aircraft components. A third agreement extends lifecycle repair support for line-replaceable units on the Airbus A320 and Boeing 737 families through Collins' FlightSense aftermarket programme.

ST Engineering said the wider scope will support component repair, asset management and material services across its portfolio. Collins said the collaboration is intended to provide responsive maintenance solutions and improve component efficiency.

The agreements strengthen an established relationship and broaden support options for operators seeking reliable component repairs and lifecycle services.

## Vietjet & Thales Expand Cooperation in MRO and Digital Aviation

Vietjet and Thales have signed a maintenance agreement and a memorandum of understanding covering digital aviation, artificial intelligence and cybersecurity cooperation.

Under the Repair-By-The-Hour contract, Thales will provide component maintenance services for Vietjet's Airbus A320 and A330 fleets. The arrangement is intended to support aircraft availability, accelerate repairs and help manage lifecycle operating costs through Thales' international maintenance network.

The companies also plan to explore digital aviation and avionics technologies, including connected aircraft services, data-driven maintenance and tools to support flight operations. Their cooperation will examine how AI-enabled analytics and secure cloud solutions could support decision-making and protect critical airline systems.

The agreement follows the identification of aviation as a key pillar of the France–Vietnam Comprehensive Strategic Partnership established in October 2024. The companies also highlighted training and technical certification pathways to strengthen local engineering capabilities in Vietnam. The partnership brings together Thales' aviation technology and MRO expertise with Vietjet's fleet and operational requirements, while opening avenues for future cooperation in digital services and cybersecurity.



# Atoms and Joby Partner to Develop US Vertiport Network

Atoms and Joby Aviation have formed a strategic partnership to acquire and develop vertiport sites in the United States, initially targeting Florida, New York, Texas and California.

The planned network is intended to support Joby's preparations for early operations under the eVTOL Integration Pilot Program and provide infrastructure for future electric air taxi services. As aircraft development moves closer to commercial service, access to suitable landing and charging locations is becoming a key requirement. Vertiports could also connect passengers with other transport options,




including ridesharing and autonomous ground vehicles, helping integrate air taxis into existing urban journeys. Atoms Real Estate develops complex infrastructure projects, combining architecture, engineering, technology and construction capabilities. Under the partnership, the companies expect to develop transportation hubs designed for electric aircraft, aircraft servicing, passenger transfers and last-mile connections. The locations and scale of individual sites will depend on further planning and development. Joby has flown its first aircraft built to conform with FAA requirements and has entered the final stage of FAA type certification, according to the announcement. The company has also conducted piloted flights in the San Francisco Bay Area and New York City.

## AutoFlight and Whitesky Sign MoU Covering 60 Passenger eVTOL Aircraft



AutoFlight and Indonesian aviation services provider Whitesky Aviation have signed a memorandum of understanding covering 60 V2000EM Prosperity passenger electric vertical takeoff and landing aircraft for the Indonesian market.

The agreement is an initial step in AutoFlight's wider effort to develop commercial applications for its aircraft internationally. The companies expect early use cases to focus on premium VIP air taxi services, with the possibility of expanding into other transportation and mobility roles. The memorandum sets out a potential cooperation framework rather than confirming that all aircraft have been purchased or delivered. Whitesky is expected to contribute local aviation operations experience, market knowledge and infrastructure capabilities.

Its proposed responsibilities include supporting vertiport development, operating procedures, safety systems, technical support and personnel readiness. AutoFlight will contribute its eVTOL aircraft development expertise and advanced air mobility technology. The partners said practical operations will depend on making journeys faster, reliable and convenient for customers, as well as building the supporting systems needed for safe service. Indonesia is being considered as an important market for advanced air mobility, although the scale and timing of any eventual commercial operation will depend on further planning and implementation.

## AutoFlight Selected for Hong Kong Low-Altitude Aviation Sandbox Trials

AutoFlight has been selected for the first round of Hong Kong's Regulatory Sandbox X initiative, which is intended to test new applications for the city's low-altitude economy.

Launched by the Transport and Logistics Bureau with support from the Civil Aviation Department, the programme provides a framework for compliant test flights, operational-scenario validation and iterative technology development. The broader aim is to explore efficient, lower-carbon air mobility applications.

Two of the four approved projects will use AutoFlight's heavy-lift electric vertical take-off and landing aircraft. The company will work with China Travel Service (Hong Kong) Automobile Services and AECOM on route planning, flight-parameter calibration and end-to-end validation.

The trials are expected to help partners evaluate potential commercial uses and the operational requirements for low-altitude aircraft. AutoFlight said the programme would support continued investment in eVTOL technology and collaboration with regulators and local industry as Hong Kong develops its low-altitude transport ecosystem. Results from the trials may help clarify the technical and operational conditions needed for wider adoption.



# Brazilian Regulator Proposes Noise Certification Criteria for Eve 100 eVTOL

Brazil's National Civil Aviation Agency (ANAC) has published proposed noise-certification criteria for Eve Air Mobility's Eve 100 electric vertical take-off and landing aircraft, marking a step in the programme's certification process.

The proposal was opened for consultation until August 8, according to the company announcement. The criteria are intended to address the acoustic characteristics of eVTOL aircraft, which differ from those of conventional aircraft and require assessment suited to their operating profiles.

Eve said the proposal follows engagement with ANAC and adapts existing aviation noise rules to the Eve 100 and its anticipated operations. The criteria are intended to define measurement methods and compliance requirements for evaluating noise across phases of flight.




Noise is an important environmental and community-acceptance issue for urban air mobility. The consultation also contributes to broader international work on consistent approaches to certifying emerging aircraft types. The proposal is one part of the wider process towards type certification; it does not itself authorise commercial operations.

# Collins Aerospace Completes Hybrid-Electric Testing for EU Clean Aviation Project




Collins Aerospace has completed integrated laboratory testing of hybrid-electric powertrain subsystems for the European Union's Clean Aviation SWITCH project at The Grid, its electric power systems laboratory in Rockford, Illinois.

The systems operated with simulated aircraft and engine environments and will now move to Airbus laboratories for further aircraft-level integration testing. The next phase will examine aircraft design interfaces, battery integration and energy-management systems.

SWITCH aims to improve engine efficiency for future short- and medium-range aircraft by integrating hybrid-electric technology with a Pratt & Whitney geared turbofan engine. The programme includes Collins megawatt-class motor-generators and controllers, with contributions from Airbus, Pratt & Whitney and GKN Aerospace.

Collins will also support the Airbus-led LEIA demonstrator, which is developing high-voltage generation and distribution technologies for future aircraft. Testing across several European sites is expected to contribute to technology demonstrations planned for 2027. The results will help engineers evaluate system behaviour before moving to more integrated aircraft-level demonstrations.

# EHang Completes Pilotless Passenger eVTOL Flight in Kazakhstan



EHang's EH216-S has completed what the company describes as Central Asia's first pilotless, passenger-carrying eVTOL flight, operating in Astana, Kazakhstan. The flights took place during the Games of the Future 2026, with the aircraft conducting several routes over the event venue and carrying Kazakhstan's Minister of Transport, Nurlan Sauranbayev, and other guests. The demonstration followed Kazakhstan's establishment in June 2026 of an initial regulatory framework covering eVTOL aircraft, vertiports and unmanned aircraft traffic management systems. EHang said the EH216-S flew under this framework approximately two months later, highlighting the importance of local regulations in developing advanced air mobility services. Kazakhstan has been exploring applications for passenger eVTOL aircraft, including demonstration and tourism flights. According to the country's Ministry of Transport, the first phase of a project is expected to focus on flights lasting between five and 30 minutes, offering visitors aerial views of natural, cultural and historical landmarks. Longer-term plans could see autonomous aircraft complement existing urban transport options. EHang previously signed a memorandum of understanding with automotive manufacturer Allur Group in 2025 to explore advanced air mobility opportunities in Central Asia. The company says its EH216-S has now flown in 23 countries across five continents.

# EHang Completes First Pilotless eVTOL Flights in Switzerland

EHang has completed the first flights in Switzerland of its EH216-S pilotless electric vertical take-off and landing aircraft, conducting demonstrations in Quinto in the canton of Ticino.

The flights were carried out with the Swiss Federal Office of Civil Aviation, the Municipality of Quinto and local project partner DroneVia. The company said the milestone expands its flight activity to 22 countries and provides an opportunity to assess autonomous electric aviation in mountainous terrain.

EHang and its partners plan to examine



potential uses in regional logistics, tourism, passenger transport and emergency response. Switzerland's Alpine valleys and remote communities present distinct transport challenges, but any future commercial operation will require appropriate regulatory approvals, airspace arrangements and supporting infrastructure.

The EH216-S is designed for autonomous short- to medium-distance air transport. The demonstrations are intended to inform further operational validation and discussions with authorities and local stakeholders about whether and how the aircraft could be integrated into Switzerland's mobility network.

## Electra and 2Excel to Support European Demonstrations of Ultra-Short Aircraft




Electra and 2Excel Aviation have signed a memorandum of understanding to support demonstrations of Electra's Ultra Short aircraft in the United Kingdom and Europe. Initial work will focus on airworthiness and flight operations support for Electra's EL2 technology demonstrator, ahead of a planned European demonstration tour in 2027. Electra's aircraft concept is designed to take off and land in less than 50 metres, potentially enabling point-to-point flights from sites as small as a football pitch. The technology combines hybrid-electric propulsion with short take-off and landing performance, with the aim of opening routes that may not be practical for conventional aircraft. Under the agreement, 2Excel will assist with engagement involving the UK Civil Aviation Authority and the European Union Aviation Safety Agency. Its planned support also covers infrastructure and ground arrangements, flight testing, demonstration operations, planning and event execution. The partnership brings together Electra's aircraft development work with 2Excel's experience in flight demonstrations, aircraft modification, maintenance and repair. The companies are also considering potential applications for Electra's EL9 production aircraft. Possible mission profiles include reconnaissance, surveillance, charter and other operations where short-field performance, payload and range could offer an alternative to existing aircraft.

## Eve Air Mobility and RV Connex to Support Thailand's AAM Regulatory Framework

Eve Air Mobility and Thai engineering and aerospace company RV Connex have signed a memorandum of understanding to support the development of Thailand's regulatory framework for advanced air mobility. The collaboration is intended to bring public and private stakeholders together as the country evaluates how future urban air mobility services could operate safely and efficiently. The companies plan to engage with industry participants and authorities on potential operating scenarios, safety requirements, airspace rules and infrastructure needs suited to Thailand's aviation environment. Their work is expected to consider international advanced air mobility standards while taking account of local operating conditions and requirements. Eve, which is developing electric vertical takeoff and landing aircraft, said cooperation with local partners can help establish the regulatory and operational foundations needed for the sector to grow. RV Connex is expected to work with government, academic and industry stakeholders as part of the process. The memorandum focuses on regulatory development and long-term industry engagement. It does not itself authorise commercial eVTOL operations or announce a launch date for passenger services in Thailand. Further work will be needed to determine appropriate rules, operating models and supporting infrastructure.



# EVE AIR MOBILITY COMPLETES FIRST PARTIAL TRANSITION FLIGHT

Eve Air Mobility has completed the first partial transition flight of its engineering prototype, advancing testing of its electric vertical takeoff and landing aircraft. The milestone involved activating the aircraft's rear pusher propeller, an early step in evaluating the transition from vertical lift toward wing-borne forward flight. During the test, the aircraft reached a stabilised speed of 27 knots and a maximum ground speed of 30 knots, with the pusher propeller operating at up to 1,200 revolutions per minute. The flight lasted three minutes and nine seconds, covered approximately 0.84 nautical miles and reached a maximum height of 90 feet above ground level. Transition testing is a critical part of eVTOL development because the aircraft must move from vertical lift to forward flight while maintaining controlled performance.



Eve said the data gathered during this initial test will support further expansion of the flight envelope and evaluation of system performance. The engineering team is continuing loads and structural analyses before proceeding with more complex tests. Eve also plans datalink testing to assess radio-link performance and support operations at speeds of up to 50 knots.

# EVE AIR MOBILITY SIGNS LETTER OF INTENT FOR UP TO 16 EVTOL AIRCRAFT



Eve Air Mobility has signed a letter of intent with Shearwater Global Capital for up to 16 electric vertical take-off and landing aircraft, supporting the finance company's plans to enter the advanced air mobility market.

Shearwater, the aviation finance business of Bay Point, is exploring ways to broaden its portfolio to include emerging aircraft assets. The companies intend to examine leasing solutions that could help operators access eVTOL aircraft and support future fleet deployment as the market develops.

The proposed arrangement reflects growing interest in financing models for new aviation technologies, where operators may seek alternatives to direct aircraft ownership. Eve says its aircraft programme is supported by Embraer's aerospace experience and an integrated ecosystem of services. The letter of intent is not the same as a firm aircraft order or confirmed delivery schedule. Any resulting transaction will depend on further agreements, aircraft development and certification, and the emergence of commercial operators with viable service plans.

# GULF AIR SIGNS LETTER OF INTENT FOR JETZERO Z4 AIRCRAFT




Gulf Air has signed a letter of intent with JetZero for an undisclosed number of Z4 aircraft, with preferential delivery positions expected in the early 2030s. The airline says the aircraft could support its network development across Europe and Asia.

JetZero positions the Z4 as a new aircraft configuration for the middle market, with a proposed capacity of around 250 passengers and a range of up to 5,000 nautical miles. The company says the design could deliver up to 50% lower fuel burn than conventional tube-and-wing aircraft on comparable routes; that performance remains a manufacturer claim tied to the programme's development.

Gulf Air said the selection reflects its interest in next-generation aircraft efficiency and passenger experience as it modernises its fleet and expands its network.

JetZero broke ground in June 2026 on a planned manufacturing facility in Greensboro, North Carolina. Initial production aircraft are expected to support testing and certification, with entry into service targeted for the early 2030s.

# SAFRAN AND AURA AERO EXPAND PARTNERSHIP ON ELECTRIC AND HYBRID-ELECTRIC AIRCRAFT

Safran Electrical & Power and Aura Aero are expanding their partnership to support the development and industrialisation of electric and hybrid-electric aircraft.

The collaboration will support serial production of Aura Aero's INTEGRAL E all-electric training aircraft, which uses Safran's ENGINeUS electric motor. It will also extend to ERA, Aura Aero's planned 19-seat hybrid-electric regional aircraft, which is designed to use eight ENGINeUS motors.

The companies also intend to work together




on propulsion architectures for future aircraft generations. Safran has supported the INTEGRAL E programme since its early development, and the strengthened relationship is intended to help both companies progress towards certification, industrialisation and market entry.

The partnership reflects broader efforts across the aerospace industry to develop lower-emission propulsion systems for training and regional aviation. The timing and scale of commercial operations will depend on programme development, certification and production readiness. The programme milestones will depend on technical progress, certification requirements and the readiness of the production system.

## Safran to Supply SkyNaute Navigation Systems for Eve Air Mobility eVTOL



Safran Electronics & Defense has been selected to supply its SkyNaute inertial navigation system for Eve Air Mobility's electric vertical take-off and landing aircraft, developed by the Embraer subsidiary.

Each aircraft is planned to carry two SkyNaute systems. The technology uses Safran's hemispherical resonant gyroscope technology and is designed to provide accurate, continuous navigation, including in conditions where satellite navigation signals are unavailable, degraded or jammed.

Reliable navigation is important for future urban air mobility operations, where aircraft may operate in complex environments and require robust positioning and guidance. Safran said the system draws on technology developed for both civil and defence applications.

Eve recently completed the hover and low-speed flight phase of its full-scale eVTOL prototype test campaign in Brazil, accumulating nearly two and a half hours of flight time. The navigation-system selection is another element of the aircraft's development, with further integration, testing and certification work still required before commercial operations.

## SkyDrive and Gold Coast Helitours Plan Australian eVTOL Sightseeing Service

Japan-based SkyDrive has signed a letter of intent with Gold Coast Helitours for the potential introduction of up to five SD-05 SKYDRIVE electric vertical takeoff and landing aircraft in Australia. The agreement is SkyDrive's first such arrangement with an Australian operator and outlines a proposed delivery schedule of two aircraft in 2028 and three in 2029. The partners intend to develop an eVTOL sightseeing service based at Marina Mirage in Main Beach on the Gold Coast. The proposed route is an approximately 10-minute scenic loop over the Broadwater, Southport and Surfers Paradise. The service is targeted for 2028, subject to obtaining the necessary aircraft certification and operational approvals. Gold Coast Helitours brings experience in helicopter sightseeing and local aviation operations, while SkyDrive is developing compact eVTOL aircraft designed for quieter, electric flight. The companies see tourism as a potential early application for advanced air mobility in a region already popular for aerial sightseeing. Ahead of a possible launch, the partners plan to work on regulatory certification and supporting infrastructure. Their longer-term plans include developing a dedicated vertiport and a maintenance, repair and overhaul facility at Southport Airfield.



# SkyDrive Demonstrates eVTOL Flight Scenarios for Seto Inland Sea Tourism

Japan's SkyDrive has completed demonstration flights of its SD-05 electric vertical take-off and landing aircraft at Yamaguchi Kirara Expo Memorial Park, simulating future scenic-tour operations over the Seto Inland Sea.

The two flights took place on July 13, 2026, without passengers or an onboard pilot. The aircraft was operated through autonomous control and remote piloting. One flight covered approximately two kilometres in six minutes and 20 seconds, reaching a maximum speed of 86 km/h and an altitude of 30 metres. The second covered 1.9 kilometres in five minutes and 42 seconds.

The demonstration also rehearsed a potential passenger journey from arrival at a vertiport to boarding an eVTOL aircraft. Attendees included Yamaguchi Prefecture officials and representatives of Suzuki Motor Corporation, SkyDrive's production partner.

The exercise was designed to assess operational procedures and illustrate how compact eVTOL aircraft could support tourism.



SkyDrive says it has conducted more than 300 prototype flights across multiple test environments as development continues.

# SkyDrive Partners with Bangkok Airways and Thai Companies to Explore eVTOL Services



Japan's SkyDrive has signed a memorandum of understanding with Bangkok Airways, Saha Pathana Inter-Holding and Saha Tokyu to explore commercial applications for electric vertical take-off and landing aircraft in Thailand.

The four companies have developed a roadmap to examine potential routes in Sri Racha, Bangkok and Koh Samui, alongside ticketing arrangements and maintenance networks. Bangkok Airways' regional network and experience serving tourism destinations could help the partners assess how eVTOL services might connect with existing air travel and airport infrastructure.

The agreement builds on an earlier 2024 memorandum between SkyDrive, SPI and Saha Tokyu. The expanded partnership will explore aircraft demonstrations, potential customer demand and the support systems needed for sales, storage, maintenance and personnel training.

The work remains exploratory. Any commercial service will depend on feasibility studies, regulatory approvals, infrastructure development and market demand. The companies aim to use the process to identify practical pathways for introducing eVTOL operations in Thailand.

# SkyDrive Reports 300 Test Flights Without Incident

Japan's SkyDrive says its SD-05 electric vertical take-off and landing aircraft has completed 300 flights without incident over a 20-month period spanning November 2024 to June 2026.

The company said the demonstration programme has generated flight data to support future operational planning, reliability improvements and decisions about suitable flying conditions. Tests have been conducted at facilities in Toyota City and Yamaguchi, as well as in other environments intended to reflect conditions closer to future commercial operations.

SkyDrive has also demonstrated the aircraft outside its test centres, including at the Osaka Expo and in Tokyo. The company reported 48 flights outside its own test facilities, giving stakeholders and local communities opportunities to observe the aircraft.

SkyDrive is targeting commercialisation in 2028. Reaching that goal will depend on further development, certification, production readiness and operational approvals. The 300-flight milestone adds to the company's test experience as it works towards potential urban air mobility services.



# VÆRIDION AND GKN AEROSPACE ADVANCE ELECTRIC AIRCRAFT CERTIFICATION FRAMEWORK

VÆRIDION has completed a second Pre-Application Contract with the European Union Aviation Safety Agency, advancing certification planning for its nine-seat all-electric Microliner in collaboration with GKN Aerospace.

The work addressed certification considerations for the aircraft's high-voltage energy storage, electrical wiring systems and power-distribution architecture. The companies said the process helped establish a proposed certification basis, subject to the testing, validation and compliance demonstrations




required in later phases.

GKN Aerospace contributed its experience in aircraft electrical wiring interconnection systems, while VÆRIDION brought its electric-aircraft development expertise. The partners have worked together for two years to mature the Microliner's electrical systems and certification strategy.

The latest milestone follows an earlier pre-application contract completed in 2024 covering distributed electric propulsion. VÆRIDION says the work has helped clarify the regulatory path toward type certification, with entry into service planned for 2030. That timeline remains dependent on development progress and regulatory approval. Further compliance evidence and formal approval will be necessary before the aircraft can enter commercial service.

## Vertical Aerospace and Saudi Arabia Set Framework for eVTOL Certification



Vertical Aerospace has signed a memorandum of understanding with Saudi Arabia's General Authority of Civil Aviation (GACA) to explore the regulatory and operational framework needed to introduce advanced air mobility in the Kingdom.

The collaboration will examine support for validation of Vertical's Valo aircraft type certification, development of regulations for future electric aircraft operations and preparations for safe eVTOL deployment. The parties also intend to exchange technical knowledge and certification practices with international aviation authorities.

The agreement reflects growing cooperation between the UK and Saudi Arabia in future aviation technologies. A separate memorandum signed with Saudi airport operator Cluster2 Airports Company will explore potential eVTOL operations across its airport network.

Together, the initiatives are intended to assess how electric aircraft could be integrated into Saudi Arabia's aviation system. Any future service will depend on regulatory approvals, operational readiness and further evaluation of routes and infrastructure. Further work will be needed to define practical operating requirements, infrastructure needs and the responsibilities of each participant.

## Vertical Aerospace Plans Public Valo eVTOL Demonstrations at Farnborough

Vertical Aerospace planned public piloted demonstration flights of its full-scale electric vertical take-off and landing aircraft at the Farnborough International Airshow, held from July 20 to 24, 2026.

The company also planned to display a full-scale commercial model of Valo, its electric aircraft programme. The demonstrations were positioned as a step in Vertical's transition from technology development towards certification, industrialisation and potential commercial service.

Vertical said its recent work included launching Valo, completing piloted transition flights, strengthening its financial position and expanding its technology partnerships. The company is now focused on meeting the remaining milestones required for certification and production.

Public flight demonstrations can help stakeholders assess aircraft capabilities, while the certification programme remains central to any future entry into service. Vertical's next steps will depend on continued testing, regulatory approval and the development of the industrial and operational systems needed to support commercial flights. The event also provides an opportunity to explain the aircraft programme to industry participants and potential operating partners.



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