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MRO 360°

AOG

Expediting the Supply of Parts

Spare Engines
Ensuring Adequate Coverage

Wheels Are Turnin'
Talking to Nikolaj Jacobsen, CEO, TP Aerospace

Troubleshooting
Precision, Pressure and Progress

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Dear Readers,

An unplanned AOG through a part failure at a distant airport is every carrier's nightmare.

Every minute counts to minimise the impact on passengers and any such AOG incident is likely to be at a massive financial loss. Not only do you have the actual costs of fixing the technical problem, but you also have the potentially time-consuming investigation into the cause of the fault, while suitable maintenance personnel and often the necessary part(s) must be sourced and delivered. Beyond this, passengers will have to be accommodated in hotels or rebooked on flights with other airlines.

Consequently, we approached several experts for their input on how the provision of materials can be accelerated in the event of an AOG.

In this issue, we have also taken a look at the topic of spare engines. What should airlines bear in mind to ensure that engines are available at the right time and to cover unplanned engine changes and/or failures?

We have also included two revealing articles on the topics of the Evolution of Aircraft Maintenance and Aircraft Mechanic Challenges in Defect Troubleshooting.

As always, I hope you enjoy reading this issue.

Peter Jorssen
Publisher


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Expediting the Supply of Aircraft Parts and Materials

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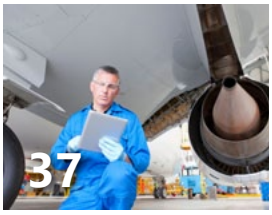

AerFin acquires four A320neo aircraft to boost global aftermarket support

© AerFin

AerFin has announced a strategic acquisition of four A320neo aircraft in collaboration with a Middle Eastern investor. This move marks a significant expansion of AerFin's capabilities in the global aviation aftermarket and reflects its commitment to sustainable, cost-effective support solutions for airlines, lessors, and maintenance, repair and overhaul (MRO) providers. The 2017 vintage aircraft, acquired from Aviation Capital Group (ACG), will be dismantled to supply high-quality used serviceable material (USM). This process extends the operational life of aviation components, providing a viable alternative to new parts for operators under cost and supply pressures. With the A320neo family recognised as one of the most successful narrow-body platforms—boasting over 10,000 orders globally—the availability of reliable USM from these aircraft will be a valuable asset to the market. Through this acquisition, the company significantly increases its USM inventory, supporting the growing demand for efficient aftermarket solutions amid heightened interest in sustainability and cost reduction across the aviation sector. Simon Goodson, CEO of AerFin, described the acquisition as "a landmark moment for AerFin" and emphasised the company's strength in securing high-value assets and delivering innovation to its customer base. This transaction highlights the company's ability to align strategic investment with the needs of a dynamic and evolving aviation industry, while expanding its global presence and technical capabilities. Carter White, Executive Vice President and Chief Commercial Officer, Aviation Capital Group said: "This transaction with AerFin represents a significant step in the evolution of the aviation aftermarket, and we are pleased to have partnered with AerFin on the sale of these four A320neo airframes.

China Airlines signs GE9X engine support deal with GE Aerospace

GE9X engine © GE Aerospace

GE Aerospace has entered into a multi-year service agreement with China Airlines for the maintenance, repair, and overhaul (MRO) of GE9X engines that will power the carrier's 14 new Boeing 777X aircraft. This agreement further strengthens the long-standing relationship between the two companies, which began in 1999 with China Airlines' purchase of GE-powered Boeing 747-400s. Based in Taiwan, China Airlines is one of the region's leading carriers and has consistently relied on GE Aerospace for engine support across its wide-body fleet. Previous service agreements have covered GE90 engines for the Boeing 777-300ER and GEnx engines for its Boeing 787 aircraft. This latest agreement marks a significant step in supporting the next generation of high-performance, fuel-efficient aircraft. The GE9X is currently the world's most powerful commercial aircraft engine and is offered exclusively on Boeing's 777X models, including the 777-9 and 777-8F. It delivers approximately ten percent better specific fuel consumption compared to its predecessor, the GE90-115B, and incorporates advanced technologies that result in significantly reduced emissions and improved efficiency. Russell Stokes, President and CEO of Commercial Engines and Services at GE Aerospace, expressed gratitude for China Airlines' continued confidence, stating that the company will work closely with the airline to ensure a smooth entry into service and reliable performance of the 777X fleet. The new MRO agreement not only secures long-term engine support for China Airlines but also reinforces GE Aerospace's role as a trusted partner in powering and maintaining the next generation of wide-body aircraft.

GMR Aero Technic wins maintenance support contract from Akasa Air

GMR Aero Technic will provide base maintenance support for Akasa Air's fleet of Boeing 737 MAX aircraft
© *Shutterstock*

Indian carrier Akasa Air has entered into a three-year agreement with GMR Aero Technic to provide base maintenance support for its fleet of Boeing 737 MAX aircraft. This collaboration marks an important step for both companies and highlights the growing strength of India's domestic MRO capabilities. As part of the agreement, GMR Aero Technic will conduct scheduled base maintenance checks at its advanced MRO facility situated within the GMR Aerospace & Industrial Park in Hyderabad. The facility is known for its cutting-edge infrastructure and technical expertise, making it a key player in India's rapidly developing aviation support sector. For Akasa Air, the agreement reinforces its commitment to fleet safety, reliability, and efficiency as it continues to expand operations. The airline views this partnership as a strategic move to uphold the highest technical standards while supporting the country's evolving aviation ecosystem. Akasa Air's management expressed strong confidence in GMR Aero Technic's experience and infrastructure, noting that the partnership aligns perfectly with their vision of delivering a safe and dependable travel experience. They also underlined their support for India's expanding MRO industry, highlighting the importance of domestic solutions in sustaining growth. This agreement not only ensures high-quality maintenance for Akasa's fleet but also illustrates the broader momentum behind India's aviation infrastructure, as airlines increasingly turn to local expertise to meet international standards.

flydubai breaks ground on state-of-the-art maintenance centre at Dubai South

flydubai has officially commenced construction on its new, purpose-built aircraft maintenance centre at Dubai South, signalling a major step forward in its operational independence and fleet support capabilities. The multimillion-dollar facility is scheduled for completion in the final quarter of 2026 and is designed to offer the carrier greater control over maintenance operations and reduce turnaround times for its growing fleet. The expansive 32,600-m² centre will feature a fully equipped aircraft hangar, dedicated support workshops and office facilities. This investment reflects flydubai's commitment to enhancing its inhouse technical capabilities and marks a significant milestone as the airline continues to scale up its fleet and global route network. The groundbreaking ceremony was attended by key dignitaries including His Excellency Khalifa Al Zaffin, Executive Chairman of Dubai Aviation City Corporation and Dubai South, alongside flydubai CEO Ghaith Al Ghaith and representatives from the

Rendering of flydubai's new maintenance centre at Dubai South © *flydubai*

Mohammed bin Rashid Aerospace Hub (MBRAH). The carrier's partnership with MBRAH for this facility was formalised at the 2023 Dubai Airshow. Strategically located near Al Maktoum International Airport (DWC)—poised to become the world's largest airport—the centre will benefit from Dubai South's integrated aviation and logistics ecosystem. This prime location ensures operational efficiency and access to cutting-edge infrastructure. Once operational, the facility will support over 600 highly skilled engineers across Line Maintenance, Technical Services, Materials and Workshops divisions. These teams will be responsible for upholding the safety and airworthiness of flydubai's fleet, playing a critical role in the airline's long-term growth and operational excellence. At the 2023 Dubai Airshow, flydubai placed its fourth order for 30 Boeing 787 Dreamliners. Today, the carrier has built a modern and efficient fleet of Boeing 737 aircraft and is expected to receive more than 120 Boeing 737 MAX aircraft over the next decade.

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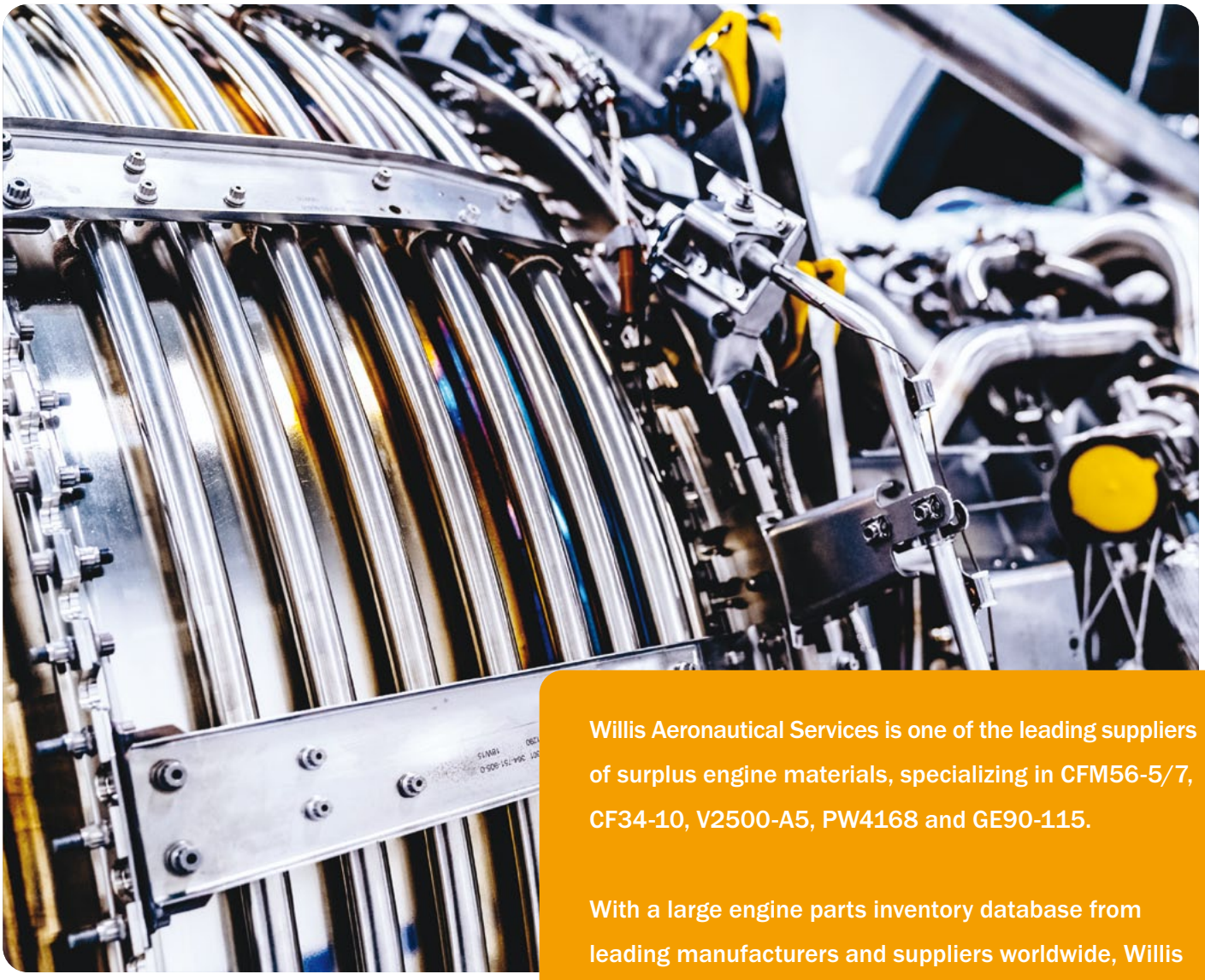

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J&C Aero provides movable class dividers for 110 SAS aircraft

J&C Aero, an EASA-certified international cabin interior specialist, has announced a new partnership with Scandinavian Airlines (SAS) to supply its advanced movable class dividers (MCDs) across the airline's Airbus A320 and Embraer E1 fleets, totalling 110 aircraft. This initiative supports SAS's strategic reintroduction of its European Business Class, which is set to launch on October 1, 2025. The movable class dividers are designed to offer maximum flexibility for cabin layout, enabling SAS to adapt seating arrangements quickly and efficiently based on route requirements and passenger demand. The MCDs can be repositioned between rows 1 and 9 and stowed behind the final passenger row when not in use, all without occupying overhead locker space. This design allows for better cabin efficiency while maintaining full use of storage areas—an important consideration for short-haul European operations. Constructed from lightweight aluminium,

Movable class dividers *© J&C Aero*

J&C Aero's MCD contributes to reduced aircraft weight, thereby supporting lower fuel consumption and advancing the airline's sustainability goals. The divider is also user-friendly for cabin crew, featuring an intuitive locking and adjustment system that enables safe and rapid repositioning during tight turnarounds. This collaboration is a key milestone for J&C Aero and aligns seamlessly with SAS' forward-looking approach to passenger comfort, operational efficiency and environmental responsibility.

Sanad and AerCap Materials finalise major aircraft component deal

Sanad has finalised one of the largest engine and airframe component sales to date with AerCap Materials, the materials business of AerCap. AerCap signed the landmark agreement with Sanad during the IATA Annual General Meeting in Delhi, a premier global gathering of airline industry leaders. Valued at over AED 400 million (US$110 million), the transaction marks a significant milestone in aviation asset management. It reflects both companies' commitment to improving the availability of key aircraft components, optimising operational efficiency, and reinforcing the resilience of the global aviation supply chain, particularly in response to evolving challenges within the industry. The deal includes a comprehensive portfolio of over 6,000 high-demand components spanning multiple aircraft platforms and lessees. These include Airbus models such as the A220, A320, A330, A340, and A380; Boeing aircraft including the 737, 777 and 787; and the Embraer E-Jet series. The inventory covers both on-lease assets currently supporting airline and MRO operations, as well as off-lease components positioned to address surging demand across global markets. This strategic alliance enhances AerCap Materials' aftermarket capabilities while allowing Sanad to optimise its asset base and reinvest capital into targeted growth initiatives. It sets a new industry benchmark for agility, scale, and responsiveness in the management of aviation components.

© AerCap Materials

EFW gains Chinese approval for A320/A321 freighter conversions

Elbe Flugzeugwerke (EFW), Airbus' Centre of Excellence for freighter conversions, has received validation from the Chinese Civil Aviation Administration (CAAC) for its Supplemental Type Certification (STC) covering Airbus A320 and A321 passenger-to-freighter (P2F) programmes. This approval enables EFW to offer its OEM-supported standard body freighter conversions to operators of China-registered aircraft, significantly expanding its footprint in one of the world's most rapidly growing air cargo markets. This development follows the CAAC's 2023 validation of EFW's A330P2F programme, under which 19 converted A330 freighters have already been delivered to Chinese operators. With the latest certification, EFW can now provide a full suite of freighter conversion options across both narrow-body and wide-body aircraft to Chinese customers, reinforcing its presence in the region. The A320P2F and A321P2F stand out in their segment with the lowest fuel consumption in their class and are the first to offer fully containerised cargo on both upper and lower decks. The A321P2F supports payloads exceeding 28 tonnes, while the A320P2F handles more than 21 tonnes. These aircraft are seen as ideal replacements for ageing standard-body freighters and offer high flexibility, cross-crew operation, and reduced operational costs—making them especially attractive to express carriers. EFW's P2F programme is the only one supported by an OEM, ensuring high lifecycle value, maintenance ease, and reliability. The company operates a global conversion network spanning eight sites, including locations in Shanghai, Chengdu, Guangzhou, and Tianjin in China. An additional facility in Okinawa, Japan, is due to open soon. Beyond China, EFW's A320/A321 conversions are also approved in Europe, the United States, Brazil, Japan, Malaysia, and India, underlining the growing international appeal of its freighter solutions.

Volato sells GC Aviation to refocus on scalable tech-driven growth

Volato Group, Inc., a technology-focused private aviation company, has completed the sale of its subsidiary GC Aviation, Inc. for US$2 million in cash. The deal included the transfer of GC Aviation's FAA Part 135 air carrier certificate, which had previously enabled Volato's managed aircraft operations. This move is part of the company's broader strategy to concentrate on scalable, tech-enabled services while outsourcing operational flight responsibilities to third-party operators. The sale aligns with Volato's aim to streamline its operations and invest more heavily in its core growth platforms: Mission Control, Vaunt, and its expanding aircraft trading and leasing services. According to Matt Liotta, co-founder and CEO of Volato, the divestment was a "deliberate move" to focus capital and resources on high-growth, high-return areas. He noted that the transaction would help reinforce the company's balance sheet and support further innovation in its tech-led business model. With this divestiture, Volato positions itself to deepen its emphasis on platform-based aviation services. The Mission Control system offers proprietary software solutions designed to enhance operational efficiency, while the Vaunt platform provides curated, experiential travel offerings. Additionally, Volato continues to explore new opportunities in aircraft monetisation, including sales and leasing models that align with its capital-efficient approach. This strategic shift reflects Volato's commitment to becoming a next-generation aviation company, leveraging technology to deliver more value to its customers and investors. The capital generated from the GC Aviation sale is expected to drive further expansion and innovation across the firm's most promising business segments.

AAR and AFI KLM E&M to establish joint venture in APAC region

AAR and Air France Industries KLM Engineering & Maintenance (AFI KLM E&M) have signed an agreement to establish a joint venture in the Asia-Pacific region to support nacelles for next-generation aircraft. Based at AAR's facility in Chonburi, Thailand, the new joint venture will carry out next-generation nacelle maintenance, repair, and overhaul services, including on-wing and on-site inspections, while ensuring extensive parts availability for their valued customers. Together, AAR and AFI KLM E&M are committed to meeting the evolving needs of the aviation industry and upholding their strong reputations for excellence in MRO services. The combination of an independent MRO with a global airline and MRO provider will deliver unparalleled service and support for operators. The establishment of the joint venture is subject to regulatory approval and will further strengthen the global network for nacelle services. "This partnership with AAR strengthens both our positions in the Asia-Pacific region. Our expertise, local proximity, and sustainable supply chain will ensure superior MRO services with enhanced efficiency, reliability, and part availability," said Benjamin Moreau, AFI KLM E&M's Senior Vice President of Strategy & Business Development. "By combining the experiences and innovative approaches of AAR and AFI KLM E&M, we are able to expand our nacelle capabilities portfolio and support an extensive network of operators," said Jim Berberet, AAR's Senior Vice President of Component Services. "Our joint venture will be positioned with strong capability to meet the needs of the largest fleets in the APAC region, and we plan to continue to cover additional engine nacelle types in the future."

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Air Transat to adopt LHT's full Digital Tech Ops Ecosystem

Lufthansa Technik (LHT) has signed an agreement with Canadian carrier Air Transat to extend its use of the Digital Tech Ops Ecosystem. Under the deal, Air Transat will implement AVIATAR – Lufthansa Technik's independent platform for data and analytics – across its entire fleet of 43 Airbus A321 and A330 aircraft. Having already integrated AMOS as its maintenance management system in 2007 and adopted flydocs for digital records in 2024, Air Transat becomes the first airline in North America to utilise the complete suite of Lufthansa Technik's Digital Tech Ops Ecosystem. This marks a major milestone in digital aviation operations within the region. Launched in 2017, AVIATAR offers a range of modular digital solutions aimed at optimising airline operations through predictive maintenance, condition monitoring and automated task fulfilment. The platform combines engineering know-how, data science and fleet management tools to drive greater efficiency and reliability across technical operations. AVIATAR is currently used by more than 40 customers worldwide, supporting over 5,000 aircraft. Air Transat will deploy a full suite of AVIATAR applications, including Condition Monitoring, Predictive Health Analytics, Technical Logbook, Engineering Analytics and the Reliability Suite. These solutions are intended to streamline maintenance procedures, improve operational decision-making, and provide real-time insights into fleet performance and technical health. The move underscores Air Transat's commitment to digital transformation and operational excellence, while reinforcing Lufthansa Technik's position as a leader in digital aviation services and predictive maintenance technologies.

Air Transat will implement AVIATAR across its entire fleet of 43 Airbus A321 and A330 aircraft © *Lufthansa Technik*

QT Aerospace secures EASA certification

With EASA certification QT Aerospace gains vital access to the European aviation market © *Shutterstock*

QT Aerospace has officially received the European Union Aviation Safety Agency (EASA) Part-145 Repair Station certification, marking the next step in expanding its international maintenance, repair, and overhaul operations. This new certification complements the company's existing Federal Aviation Administration (FAA) Part-145 credentials (ST1R492K), enabling it to fully service European-registered aircraft and components directly from its Dallas, Texas base. With the EASA approval now in hand, QT Aerospace gains vital access to the European aviation market. The certification brings its services into full alignment with FAA requirements, reinforcing the company's ability to deliver compliant, cross-border MRO solutions. Clients operating European-registered aircraft can now benefit from QT Aerospace's advanced composite and structural repair services, which cover flight control surfaces, engine inlets, cowls, and thrust reversers. The company also offers emergency "quick-turn" services designed to minimise aircraft downtime. QT Aerospace's facility in Dallas is strategically placed to support global operations. With the capacity for round-the-clock aircraft on ground (AOG) services, it is fully equipped to respond rapidly and dispatch components or teams globally, enhancing turnaround times for international customers. QT Aerospace, headquartered in Dallas, is highly regarded in the aviation sector for its expertise in airframe composite repair. With a focus on excellence, safety, and innovation, the company continues to raise the bar in providing high-quality MRO solutions across a growing international client base.

AerFin completes first aircraft disassembly at Hong Kong Airport

Disassembly of one of the six A330-200 aircraft at Hong Kong International Airport © *AerFin*

AerFin, a prominent aviation asset specialist, has achieved a historic industry first by completing the commercial disassembly of several aircraft at Hong Kong International Airport (HKIA). This milestone project not only highlights the company's innovative approach and operational excellence but also reinforces its dedication to sustainable aviation practices. The undertaking involved the strategic acquisition and disassembly of six Airbus A330-200 aircraft that had been grounded at HKIA since 2018. Conducting such a complex operation at one of the world's busiest airports—where over 1,000 flights operate daily—required careful planning, close coordination with airport stakeholders and precise technical execution. This project presented unique challenges from the outset. Conducting an aircraft disassembly at an active airport required extensive coordination with multiple stakeholders, including the Hong Kong Civil Aviation Department (HKCAD) and Airport Authority Hong Kong (AAHK). Both organisations needed assurance that the project would meet rigorous safety, regulatory and environmental standards. The complexity was heightened by the inclusion of Pratt & Whitney PW4000 engines, which presented a unique set of disassembly and logistics challenges. Handling these engines safely within the HKIA environment required detailed technical planning and adaptive engineering solutions, which AerFin's teams navigated with precision. In addition to securing the necessary regulatory approvals, AerFin collaborated closely with local partners, including HAECO and Great China Aviation Consulting (GCAC), to work with the AAHK to establish a protected disassembly bay within the airport. This innovative solution allowed disassembly work to proceed without disrupting HKIA's daily operations. Simon Goodson, Chief Executive Officer of AerFin, described the project as a defining example of the company's ethos. "This project embodies the AerFin way – a unique blend of commercial insight, operational rigour and technical excellence," he stated. "Our team worked hand-in-hand with operators and stakeholders over many months to design a practical, safe and efficient plan for this disassembly – and we delivered it with the precision and professionalism that define us." This landmark achievement is part of a broader strategic initiative by AerFin. In 2024, 32 Airbus A330ceo aircraft were permanently retired from commercial service. AerFin secured 18 of these retired aircraft, significantly expanding its inventory of high-quality, lower-cost components. This move enhances the company's ability to support A330ceo operators around the globe, strengthening its position as a trusted partner offering value, availability and comprehensive lifecycle support across the A330ceo platform.

FL Technics acquires Czech MRO firm JOB AIR Technic

FL Technics has announced a major expansion of its European footprint through the strategic acquisition of JOB AIR Technic a.s., a Czech MRO company. The deal, still subject to statutory approvals and closing conditions, includes a large-scale 17,000 m² maintenance facility located at Leoš Janáček Airport in Ostrava, Czech Republic. This move significantly enhances FL Technics' capabilities in Central Europe by securing vital maintenance infrastructure in a highly strategic location. Founded in 1993, JOB AIR Technic was formerly part of the Czechoslovak Group (CSG), a prominent Czech industrial and technology conglomerate. The company brings a workforce of over 400 skilled professionals and a robust MRO offering, with two large hangars housing eight maintenance bays capable of handling both narrow-body and wide-body aircraft. In addition to providing core base maintenance services, the facility includes a certified Part 147 maintenance training centre, supporting a broad range of technical services such as avionics, structural and composite repairs, non-destructive testing, emergency equipment servicing, and cabin interior refurbishments. JOB AIR's client portfolio includes major European and international airlines, with support capabilities for aircraft types such as the Airbus A320 family (including A320neo), A330 and Boeing 737 NG and MAX series. The company's extensive regulatory accreditations—covering EASA, FAA, Transport Canada, and the Bermuda CAA—enable it to handle aircraft registered under multiple jurisdictions, further broadening the operational scope for FL Technics following the acquisition. The acquisition not only reinforces FL Technics' presence in Europe but also supports its long-term strategy to deliver comprehensive, globally integrated MRO solutions.

LHT breaks ground on engine maintenance hub at Calgary Airport

Rendering of Lufthansa Technik Canada, at Calgary International Airport © *Lufthansa Technik*

Lufthansa Technik (LHT) and Calgary Airports have officially commenced construction on a new, state-of-the-art engine maintenance facility at YYC Calgary International Airport, marking a major investment in Western Canada's growing aerospace sector. The project, valued at CA$120 million (US$88 million), is set to establish a new benchmark for aircraft engine maintenance and testing capabilities in North America. The facility, operated by Lufthansa Technik Canada—a wholly owned subsidiary of Lufthansa Technik—will span 150,000 ft² (around 14,000 m²). Its core services will focus on near-wing and quick-turn maintenance of CFM International LEAP-1B engines, which power the ever-expanding Boeing 737 MAX fleet. Notably, the site will feature Canada's first engine test cell for latest-generation aircraft engines, underlining its technological significance and capacity for innovation. Scheduled to become fully operational by 2027, the new repair hub is expected to create at least 160 permanent positions by 2030, with a further 170 temporary roles generated during the construction phase. The design, logistics and development have been closely coordinated between Lufthansa Technik Canada and Calgary Airports, with the latter managing financing, planning, and implementation as part of its broader YYC AeroNex initiative—an aviation development strategy aimed at transforming Calgary into a world-class aerospace hub. In preparation for launch, recruitment is already underway. Lufthansa Technik Canada has filled 30 positions and plans to hire at least 50 more by year-end. Roles include engine mechanics, technical trainers and engineering staff. A dedicated training centre with four bays will soon open in Calgary, providing hands-on education and live training events. Additionally, a partnership with the Southern Alberta Institute of Technology (SAIT), formalised through a memorandum of understanding, will help ensure a steady pipeline of skilled workers through tailored aviation training programmes. The project signals a long-term commitment to boosting Alberta's aviation industry while supporting sustainable economic development in the region.

Astronics strengthens certification capabilities with Envoy Aerospace acquisition

Astronics Corporation has reported the acquisition of Envoy Aerospace. The US$8 million deal aims to strengthen Astronics' capabilities in aircraft connectivity, in-seat power systems and cabin modifications. Envoy Aerospace is a well-established provider of FAA Organisation Designation Authorisation (ODA) services, specialising in type certification solutions for aircraft and rotorcraft. The company supports customers in securing FAA Supplemental Type Certificates (STCs), Parts Manufacturer Approvals (PMAs), and foreign type approvals for complex aircraft modifications. With the integration of Envoy's nine employees, Astronics gains in-house access to critical certification processes, which are currently in high demand but short supply across the aviation sector. The acquisition is particularly strategic as it enables Astronics to streamline product certification and approval timelines, allowing quicker implementation of cabin upgrades, inflight connectivity enhancements, and reconfigurations tied to aircraft lease returns. The move also strengthens Astronics' position amid a broader industry trend towards increasing aircraft modification activity. Mike Kuehn, President of Astronics Connectivity Systems and Certifications (CSC), highlighted the strategic alignment, stating: "Envoy Aerospace's extensive experience and trusted reputation as an ODA make them a perfect fit for Astronics, supporting our strategic thrust for Inflight Entertainment and Connectivity." He added that the deal ensures dedicated access to ODA services for both Astronics and Envoy customers, enhancing the certification pathway for their technologies. Ongoing and future projects by Envoy Aerospace will continue as planned, with the added backing of Astronics' wider operational and technological infrastructure. The acquisition underscores Astronics' commitment to meeting the growing demand for certified, cutting-edge aerospace solutions by strengthening its internal expertise and expanding its service offering.

Aventure Aviation acquires a dozen 737NG aircraft to bolster parts inventory

A group of Aventure's newly acquired Boeing 737NGs awaiting tear-down in Arizona
© *Aventure Aviation*

Aventure Aviation has announced the acquisition of twelve Boeing 737 Next Generation (737NG) aircraft formerly operated by Alaska Airlines, marking the largest single purchase in the company's history. The aircraft—identified by serial numbers 30013, 30014, 30015, 30016, 30017, 30018, 30019, 30021, 30856, 30857, 33679 and 33680—will be dismantled in phases at facilities in Arizona. Talha Faruqi, President of Aventure Aviation, described the acquisition as a "major milestone," emphasising the significance of securing a fleet that had been exclusively operated and maintained by Alaska Airlines. He highlighted that the well-documented service history of the aircraft, maintained by a top-tier carrier, would enhance component traceability and reliability—critical factors for Aventure Aviation's customers across the aviation aftermarket. According to Andrew Crombie, Director of Asset Management, the purchase coincides with a major expansion at Aventure's Peachtree City headquarters. The company is nearing completion of a new facility that will provide five-times the current warehouse capacity, significantly enhancing its ability to store, manage, and distribute 737NG parts. This acquisition not only signals Aventure Aviation's continued growth but also its commitment to supplying high-quality, traceable aircraft components to the global aviation sector.

StandardAero Van Nuys Service Centre gains AFAC certification

StandardAero's Van Nuys, CA, Service Centre has received certification from Mexico's Agencia Federal de Aviación Civil (AFAC). This authorisation enables the facility to carry out airframe maintenance, repair, and overhaul services on select large-cabin aircraft registered in Mexico, as well as line maintenance support for Rolls-Royce Spey and Tay engines, Pratt & Whitney Canada PW306 engines, and Honeywell GTCP36-100 and -150 auxiliary power units (APUs). The AFAC certification reinforces StandardAero's commitment to extending its high-quality service and technical support to aircraft operators in markets beyond North America. StandardAero's Van Nuys Service Centre, located at Van Nuys Airport (VNY), offers a full range of airframe, avionics, interior, structural, and select engine services for large-cabin aircraft operators across Southern California and further afield. "This certification is an important milestone for StandardAero VNY that strengthens our ability to serve our customer base from Mexico, closer to home," said Katie Higgins, Vice President and General Manager of StandardAero Van Nuys. "Van Nuys joins our Augusta, GA and Houston, TX business jet service centres certified by Mexico's aviation authority, giving those operators coast-to-coast aircraft support from the USA," added Tony Brancato, President of StandardAero Engine Services – Business Aviation division. "We continue to invest in our people and facilities to ensure we meet the evolving needs of our customers and the global market." StandardAero's service centre at VNY, formerly known as Western Jet Aviation, Inc., has been operating for over 25 years, specialising in Gulfstream aircraft maintenance.

AVIAN and Alliance Airlines partner on strategic inventory deal

AVIAN Inventory Management (AIM), a bespoke provider of inventory capital solutions and financier to the aviation industry, has announced a new partnership with Alliance Airlines in Australia. Alliance is a regional carrier supporting wet lease and charter operations for the energy and resources sectors, along with sports and entertainment charters. Under the agreement, AVIAN will acquire Alliance's E190-related inventory and establish a distribution centre in Brisbane to meet the airline's Embraer inventory requirements. This initiative supports Alliance's anticipated growth and expansion, as it transitions its 79-strong fleet from a combination of Fokker and Embraer E190 aircraft to an all-Embraer fleet in the coming years. Ian Gurekian, CEO and founder of AVIAN Inventory Management, commented on the deal, "AVIAN is extremely proud to have been selected by Alliance to provide an inventory solution and supply their aircraft parts and component portfolio needs. Alliance is AVIAN's first airline customer, and this partnership is testament to how our platform's innovative, customised solutions can be equally applied to airlines, OEMs, suppliers and MROs to release value trapped in valuable aerospace inventory, optimise distribution, and re-direct capital to growth efforts. We thank Alliance for the trust they have placed in AVIAN and are very excited to install our proven platform in Brisbane and serve Alliance as well as the entire APAC region from that location." In addition to serving Alliance, AVIAN will also supply Embraer operators across Australia and other neighbouring countries.

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Talking to Gilles Mercier, CEO of Barfield

By David Dundas

AviTrader MRO 360⁰: Barfield is celebrating this year its 80th anniversary. Can you tell us a bit about the history of Barfield?

Gilles Mercier: Barfield was founded in Miami in 1945 by James W. Barfield, initially as a family-owned business focused on providing high-quality aircraft maintenance services to a rapidly growing aviation industry. Over eight decades, Barfield has evolved from its local roots into a nationally recognized provider of maintenance, repair, and overhaul (MRO) services and ground support test equipment. The company expanded its footprint to operate facilities in Miami, Phoenix, Louisville, and Atlanta, serving commercial, regional, and cargo operators across the Americas and beyond. Barfield's growth has been marked by its adaptability, commitment to quality, and a strong customer focus, making it a respected name in aviation maintenance for 80 years.


Gilles Mercier, CEO, Barfield

What are the core services that Barfield offers?

Barfield provides a comprehensive suite of aviation services, including:

- Component repair and overhaul for a wide range of aircraft types (Airbus, Boeing, Bombardier, ATR, Embraer)
- Maintenance programs tailored to airline needs, including Inventory and logistics solutions, engineering, fleet support, and component reliability management
- Distribution of spare parts and OEM products
- Ground Support Test Equipment (GSTE) design, manufacture, and support
- Rotables and trading services
- Unmanned Aerial Vehicle (UAV) and drone support

These services are delivered from multiple strategically located facilities, ensuring timely and effective support for operators throughout North, Central, and South America.

What are the key drivers of the company´s success story?

Barfield's success is built on several core drivers:
• **Customer Focus**: A strong commitment to customer satisfaction and customer care
• **Employee Expertise**: Highly skilled and dedicated teams regarded as the company's greatest asset
• **Continuous Improvement**: Emphasis on reliability, efficiency, and lean-driven processes
• **Adaptability**: Ability to evolve with industry changes and embrace new technologies, such as UAV support
• **Ethical Standards**: High standards of ethical behavior and teamwork
• **Long-term Partnerships**: Building trust with customers and business partners, as well as nurturing long-standing relationships within the aviation industry

In 2014, AFI KLM E&M acquired Barfield. How is the company integrated into the AFI KLM E&M organization? What are the synergies of this acquisition?

Barfield became a wholly owned subsidiary of AFI KLM E&M in 2014, integrating into one of the world's leading MRO networks. This integration has enabled Barfield to leverage AFI KLM E&M's global resources, technical expertise, and logistics infrastructure. The synergies include:
• **Expanded Service Portfolio**: Barfield complements AFI KLM E&M's offerings with specialized component repair, test equipment design, and distribution capabilities
• **Broader Market Reach**: The acquisition enhanced AFI KLM E&M's presence in the Americas, providing customers with a wider range of high-quality, competitive services locally
• **Resource Sharing**: Access to AFI KLM E&M's extensive logistics, engineering, and technical support networks
• **Comprehensive Support**: Customers benefit from seamless, integrated solutions across both organizations, including adaptive support for various aircraft types and new technologies

Looking ahead, how do you see future developments and embracing transformation?

Barfield is committed to continuous transformation and innovation to meet the evolving needs of the aviation industry.

The company is heavily investing in its 4 facilities in the US to increase capacity, develop new capabilities and new technologies. Barfield's future strategy includes:
• **Capacity**: Increasing capacity and modernizing all 4 locations in Miami, Atlanta, Louisville and Phoenix
• **Adopting Advanced Technologies**: Introducing cutting-edge new technologies in repair capabilities, new Ground Support Test Equipment products and drone solutions.
• **Sustainability and Efficiency**: Embracing lean processes and digitalization to enhance operational efficiency and environmental responsibility
• **Talent Development**: Investing in professional development and industry engagement to foster the next generation of aviation professionals
• **Customer-Centric Innovation**: Continuously evolving services and support programs to anticipate and exceed customer expectations in a dynamic market

Barfield's legacy of resilience, adaptability, and partnership positions it to remain a leader in aviation maintenance as the industry continues to transform.

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AOG Management

Expediting the Supply of Aircraft Parts and Materials

By David Dundas

The unexpected failure of an aircraft part usually means one thing – it becomes inoperable, and aircraft on ground (AOG) costs are the financial bane of any carrier. Consequently, there is an unavoidable sense of urgency whenever an aircraft becomes grounded through a part failure, particularly as it is likely to be many miles away from usual MRO facilities. We wanted to delve deeper into the world of these unexpected parts failures and the ways carriers and MRO set-ups are able to mitigate for such events in order to minimise unplanned AOG time, so we turned to five of the industry's established MRO companies to get their input on the topic.

Craig Skilton, Vice President - Components, APOC Aviation

Who is responsible for part availability?

To begin with, we wanted to know who, in an airline operation, is responsible for making parts available when there is an unexpected failure. Craig Skilton, VP Components at APOC Aviation advises us that: "The onus initially is on the airline's supply chain team to give visibility around what parts are needed in those critical locations, even outside of contract situations, suppliers are generally receptive to place stock in remote warehouses. For suppliers like APOC, if there is known and repeat demand, then the cost of moving stock remotely can be offset by the customer requirements they know they will soon be servicing. Without that demand visibility, then suppliers will be more comfortable

> **"For suppliers like APOC, if there is known and repeat demand, then the cost of moving stock remotely can be offset by the customer requirements they know they will soon be servicing."**
>
> *Craig Skilton, Vice President - Components, APOC Aviation*

holding stock at the main hubs to support the wider customer demographic." Chris Ricely, Manager of Asset Repairs at Setna iO has a history that is focused on engine materials for commercial platforms and sees multiple options. "One request, for one part, to guarantee an on-time delivery signals many responses in a dynamic network leading to hundreds of hands to complete the same goal, availability. My background in repair management, with primary focus on engine material for commercial platforms, truly starts when a non-serviceable asset is purchased and material returns to the market. When there is no availability of serviceable material on hand, availability must be created – send material out for repair. Initiating a repair request starts a ripple effect of many theorical questions that must be answered immediately – MRO location, reliability, and output. All information available in a database; 'open sale', 'in stock', and 'on repair' really holds no weight at the end of the day if the material is given no direction, instruction, or immobile. As removed material has 0% chance in becoming viable without movement and possible repairability, in many instances the airline relies completely on the repair network to fill the gaps and creates availability and demand that previously did not exist. Forecasting and anticipating customer needs while creating demand really proves the importance of the MRO network," he says.

At VAS Aero Services Senior Vice President of Sales & Material Management Mike DeMicco immediately focuses on the need for logistics to provide the solution, commenting that: "In an AOG situation, time is critical, and the responsibility for ensuring immediate availability of spare parts falls primarily to the airline's logistics and supply chain team. While engineering may identify the needed part, and maintenance executes the fix, it is logistics that ultimately drives the process to get the right part, to the right place, at the right time. That often requires close coordination with parts suppliers such as VAS Aero Services who offer immediate access to a broad inventory of new and USM parts." Tony Zana Director of Sales EMEA, at Werner Aero, LLC is very much in agreement with DeMicco in terms of seeing logistics playing a lead role, but believes three other elements as perhaps more critical. "In today's airline operations, the Materials or Logistics Control Center (procurement team) often takes the lead when it comes to AOG support. However, this is increasingly a cross effort involving Maintenance Control, Supply Chain, and third-party logistics providers like Werner Aero. With the growing integration of real-time tracking systems and predictive maintenance tools, decision-making is shifting toward data-driven collaboration between technical operations and supply chain departments. Cost, compliance, and urgency—is effectively in the driving seat," he tells us.

Shipping a part from an airline´s maintenance hub to another location may be too time consuming. So, what other options might be available?

The location of an aircraft that is in need of a spare part is critical to deciding how best to get that part delivered in the swiftest possible time period. In many instances, despite the availability of a specific part on its premises, the MRO operative may decide that shipping direct from there may be too time consuming. So, what other options might be available? Chris Ricely sees a strong network as critical to providing a solution to a potentially costly problem, advising that: "Allocating material is never completed after the perfect purchase, or repair, is initiated – the expectation is to have multiple strategic options with the understanding of how to thrive in variances and discrepancies with ease and flexibility. Creating availability truly starts with a reliable network of multiple business structures in addition to the standard global MRO network. Setna iO is extremely successful within our own network – Setnix (MRO in AZ and UK) and Zulu (MRO in FL). Having ample material on hand in anticipation for customer needs ensures our ability to provide in stock, ready to go material. Locality plays a major factor, with volumes of stock poured at multiple sites, and headquarters in Chicago, quick deliveries with fewer obstacles is standard business practice and why Setna iO thrives."

Meanwhile, having identified that any sourcing strategies used to be a massively time-consuming, manual process, Erkki Brakmann, CEO and Co-founder of SkySelect. Inc informs us that AI has now changed that landscape. He explains: "To mitigate risks and avoid costly delays, airlines need to evolve their sourcing strategies. Often, airlines have hundreds of approved vendors, and there is a good chance that one of them has the required part in stock. If not, the next step is to expand the search to the broader market. However, the sourcing process is typically manual, and in AOG situations, there is no time to identify all potential suppliers on the approved vendor list or those outside of it who may have the part in stock. To optimise this process, buyers often reach out to a select group of preferred suppliers and the OEM, which serves as the last line of defence. Modern technologies, such as artificial intelligence (AI), help eliminate the time constraints faced by buyers. By utilising data, AI can instantly identify the most likely approved or non-approved suppliers that can provide the needed part to address the AOG situation. It can also verify actual market availability and suggest the best option based on the AOG requirements. According to

Chris Ricely, Manager of Asset Repairs, Setna iO

> **"Creating availability truly starts with a reliable network of multiple business structures in addition to the standard global MRO network."**
>
> *Chris Ricely, Manager of Asset Repairs, Setna iO*

data, SkySelect Procurement AI has a success rate of over 75% in finding parts on the market during AOG situations, with an average response time of just 16 minutes. Mike DeMicco sees pooling agreements and exchange programmes as mitigating solutions to AOG location problems as he explains: "When shipping a part from an airline's maintenance hub will delay needed repairs and increase AOG time, having an alternative source can save money and assure continuity of service. One option is to access local or regional part inventories that have been strategically positioned at key airports or partner MRO facilities. Operators can also tap into parts pooling agreements and exchange programs, allowing access to shared inventories across a network of operators. The best, most reliable and most economical option is to work with third-party supply partners like VAS who have a deep inventory of new and USM parts, a range of stocking and replacement programs, and the global logistics capabilities to expedite delivery from closer stock points to minimise aircraft downtime."

To conclude this section, Tony Zana feels that there is no single solution, but suggests that: "Airlines and MROs now rely heavily on a mix of strategic alternatives such as: Local pooling arrangements with OEMs or third-party providers such as Werner, or consignment stocks placed at critical locations, inter-airline loans and exchanges, which can be quickly facilitated through platforms like ILS or Aeroxchange, and finally on-demand charter logistics or courier services for urgent moves."

Erkki Brakmann, CEO & Co-founder, SkySelect, Inc.

What preparations should airlines make to reduce the effect of AOG down times due to missing materials?

So, the next question we wanted answers to relates to what preparations airlines should make to reduce the effect of AOG down times through missing materials? Mike DeMicco sees real-time inventory visibility and a 24/7 response team as high on the list of priorities as he feels that: "To reduce the impact of AOG downtime caused by missing materials, airlines must adopt a proactive and well-coordinated approach. This starts with robust inventory planning, ensuring critical parts are stocked at strategic locations based on fleet type, failure trends, route network and maintenance histories. Real-time inventory visibility through digital systems helps track availability across hubs and partners. Establishing AOG response teams that operate 24/7 enables quick decision-making and coordination across departments. Having a strong relationship with a third-party supplier and logistics provider that offers 24/7 AOG services, such as VAS, will ensure priority support during emergencies. Pooling agreements, exchange programmes and pre-arranged leases can offer access to additional spares when internal stock is insufficient. Investing in predictive maintenance technologies can also help identify issues before they cause failures."

It is clear that Chris Ricely is very much a believer in being proactive as opposed to reactive when it comes to AOG scenarios. "A dynamic strategy is required and expected as conducting business per status quo day to day does not create maximum potential as volume and scale of material is particularly import here. In repairs, price and TAT are not the only drivers, but more importantly ensuring that there are multiple streams of repair throughout the global MRO network, for example, of the same part. When material can ship directly to customers and knowing where your material is will create the greatest opportunity in a 24/7 worldwide market," he tells us. Erkki Brakmann is of a like mind to Ricely in terms of the need to be proactive, while he also sees diversified sourcing practices as an additional and important element. He explains in detail: "Airlines can significantly reduce the impact of AOG downtimes caused by missing materials by making a strategic shift towards proactive material management and diversified sourcing practices such as: Vastly Expanded Supplier Network – When a part is missing for an AOG, airlines should not be stuck waiting for their usual vendors. If you have real-time access to the entire market availability (such as SkySelect), you can instantly tap into a much wider pool and also minimize future delays. Real-time Comparisons and Visibility – Parts procurement technologies allow airlines to compare vendors in real-time on critical factors, including price, availability, location, and lead time. This is critical for AOGs, as the fastest delivery from the nearest available source is often more crucial than the lowest price. This direct comparison capability drastically reduces the time spent on manual quote gathering and evaluation. Improving Planning with Insights on Market Availability – The availability of parts in the market varies constantly. Understanding which parts are in stock or readily available, and which are becoming scarce can help adjust inventory levels, preventing overstocking or stockouts."

Tony Zana is quite succinct in his response to the question as he sees four key areas that airlines should invest in to help mitigate the problem of AOG times owing to failed parts, advising that: "Preparation starts with strong forecasting and data analysis/ In my opinion airlines should invest in:

- Predictive maintenance systems to anticipate failures.
- Strategically located forward-stocking hubs near high-traffic routes.
- Reliable spare parts supplier or pooling access.
- Robust AOG response protocols that

> **"Airlines can significantly reduce the impact of AOG downtimes caused by missing materials by making a strategic shift towards proactive material management and diversified sourcing practices..."**
>
> *Erkki Brakmann, CEO & Co-founder, SkySelect, Inc.*

integrate logistics, customs clearance, and supplier activation in one playbook."

What options are available for the sourcing of parts in the optimum location?

It is clear that effective part sourcing is paramount for mitigating AOG incidents. So, this question relates to available options for the sourcing of parts in the optimum location? Chris Ricely at Setna iO quotes a realtor's or estate agent's response to the question: What is the most important aspect of any property? He explains: "Location, location, location! In real estate, investing in location has the same pay off as it does in the parts network. Committing material to multiple MROs globally creates flexibility as investing resources to new locations provides to a business's long term. Outside of repair capabilities and certifications, there are many logistical variables to consider: country of origin/manufacture code, size of shipment, and import/export, and again, having a dynamic stream globally is the only solution. At the end of the day a part will sell to its end user based on need, however, fulfilling all demands to mitigate each variable is the show behind scenes. Setna iO has compressed these steps though strategic location planning, investing, and development. Making daily decisions while planning for tomorrow is second nature when placing emphasis on location." Werner Aero's Tony Zana sees two key options to use here, commenting that: "Digital sourcing tools are now central to finding the best location quickly. Airlines and MROs use platforms like: PartsBase, ILS, or Aviall to locate parts globally in real time. Partnerships with spare parts supplier and aftermarket asset management companies who maintain forward-deployed inventory in key regions also offer a competitive advantage in sourcing."

Tony Zana, Director of Sales EMEA, Werner Aero, LLC

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Erkki Brakmann at SkySelect adopts a very pragmatic and uncomplicated approach to the challenge as he tells us that "A critical shift involves leveraging advanced procurement platforms that provide real-time access to a diversified global supplier network. These systems enable airlines and MROs to identify the right suppliers and instantly determine actual market availability. By allowing the instant comparison of thousands of potential sources based on crucial factors such as price, availability, location, and lead time, they help to solve AOG faster." Over at VAS Aero Systems, Mike DeMicco comes up with several useful ideas as he suggests that: "To source a part in the best location, airlines can leverage several options, starting with their own internal inventory control system, which should provide a real-time view of parts availability across all locations, enabling efficient allocation. Airlines can also use global parts pooling networks, allowing access to shared inventories among partner airlines and MROs. The best solution is a third-party logistics provider and spare parts supplier like VAS, that has global warehousing capabilities and can locate and expedite parts virtually to and from anywhere."

What is the best strategy to reduce the down time of an AOG related to high-failure-rate components?

Finally, we wanted to focus on high-failure-rate components and what MRO operators were the best strategies to adopt to reduce AOG down time in relation to these parts. At APOC Aviation, Craig Skilton places main focus on analytics, as he explains: "We're entering a time where technology, especially analytical-orientated solutions around predictive maintenance, can help mitigate the risk around high-failure-rate components before they lead to AOG situations. Rather than simply having awareness of high-failure-rate components, those airlines, MROs and parts suppliers like APOC, that effectively leverage modern technology can benefit through detailed trend analysis and statistical models that correlate failure events. Those inputs can be translated into fully optimised stock levels, ensuring that airlines maintain the right stock based on actual usage and predicted failures. The output of which, can be provided to suppliers ahead of time, enabling the sourcing event to be focused on finding the best price, rather than price being pushed down the priority list when an AOG comes along."

> **"Digital sourcing tools are now central to finding the best location quickly. Airlines and MROs use platforms like: PartsBase, ILS, or Aviall to locate parts globally in real time."**
>
> *Tony Zana, Director of Sales EMEA, Werner Aero, LLC*

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Chris Ricely feels that understanding the nature of specific material places a human factor to creating organic solutions for high failure rate parts. Accepting that all orders continue to be deemed non-serviceable is the same as having as removed material on hand with no action. He then goes on to explain that: "Communicating and addressing these concerns creates new avenues and solutions. There is a true translation of information that AI cannot take and solve when gathering information from a customer service representative that was translated down from an engineer. In repairs, non-serviceable is non-negotiable. Is there a DER, extended repair, EA/DR that can address the non-conformance? High failure rate material has additional metrics and variances to account for, and all strategies must be involved to achieve any potential yield. Each new strategy evolves the standards of acceptance in the market, as a part is deemed serviceable when certified when all solutions have been exhausted."

Mike DeMicco feels that reducing AOG downtime caused by high-failure-rate components requires a data-driven strategy, in particular, identifying failure-prone components through reliability analysis and maintenance records. He suggests that one needs to: "Implement predictive maintenance tools to monitor component health and address issues before failures occur. Ensure adequate replacement stock levels of these parts are maintained at key operational locations. Engage in quick-turn repair agreements with MROs and maintain exchange programs for fast part replacements. Participate in exchange programs, pooling arrangements and develop strong supplier relationships with partners such as VAS to ensure faster access to critical parts. Integrate real-time inventory tracking systems to quickly locate and mobilise parts across the network, and, lastly, regularly review failure data to adjust stocking strategies. Use the data to mitigate the impact of high-failure-rate components."

For Tony Zana, pre-positioning and data prioritisation make up the most effective strategy to help reduce down time related to high-failure-rate components, which includes three elements: "Identifying high-failure-rate components through reliability analysis; stocking critical parts at line stations or regional hubs where failure likelihood is highest, and partnering with PBH (Power by the Hour) providers and strong use of aftermarket suppliers" He then concludes that: "This proactive, intelligence-led approach significantly compresses AOG timelines."

> **"Participate in exchange programs, pooling arrangements and develop strong supplier relationships with partners such as VAS to ensure faster access to critical parts."**
>
> *Mike DeMicco, Senior Vice President of Sales & Material Management, VAS Aero Services*

Mike DeMicco, Senior Vice President of Sales & Material Management, VAS Aero Services


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Simplifying Aircraft Wheel and Brake Solutions

Talking to Nikolaj Jacobsen, CEO, TP Aerospace

AviTrader MRO: TP Aerospace is a key player in the wheels & brakes business. Can you tell us a bit about the history of the company?

Nikolaj Jacobsen: The TP Aerospace: The company was founded in 2008 and was built on a vision to bring simplicity to a highly complex niche within the aviation industry, and this is still the case today.
We have evolved to become a one-stop shop for aircraft wheels and brakes, supporting a recurring and growing customer base.

What are the core services that TP Aerospace offers?

TP Aerospace prides itself on being more than a service provider. It is a value chain optimiser. By working closely with OEMs, maintaining robust inventory buffers, and aligning with its airline partners, it helps reduce waste, increase efficiency, and ensure continuity even during supply chain disruptions.
We offer a fully integrated exchange Flat-Rate Programs where the customer pays a fixed rate per landing and Land For Less (LFL) Programs that provide a less-integrated solution where customers pay a fixed fee per exchange event.
In addition, we have the largest spares stock in the aftermarket and is an active purchaser of inventory, either serviceable or in need of repair. We also offer a 24/7 service for AOG situations or routine delivery.

The third leg of the business is distribution of new OEM wheels and brakes piece parts and assemblies across all types and platforms.

What are the key factors of the company´s success story?

Airlines demand more than just repairs, they want predictability,


Nikolaj Jacobsen, CEO, TP Aerospace

transparency, and peace of mind. They want a partner who understands the intricacies of the wheels and brakes ecosystem and who can proactively mitigate risks. The great thing is that OEMs also want a partner that can handle this part of the value chain and that is why TP Aerospace partners with both sides.
TP Aerospace has embraced this shift, with a service model built around end-to-end lifecycle support, ensuring that customers can focus on flying while it handles the rest. From predictive maintenance to inventory planning, it is helping airlines turn uncertainty into reliability.

What trends do you see in the wheels & brakes market?

A clear trend is emerging that airlines are increasingly seeking long-term partnerships with specialised providers like TP Aerospace. They're not just looking for a repair shop - they want a strategic partner who understands their operational needs and can deliver tailored, efficient solutions that are agile and trustworthy. This shift spans all airline segments, from cargo to passenger and ACMI operators.

Looking ahead, how do you see future developments and embracing transformation?

Investments are being made, automation, and digital tracking, as well as a focus on AI and machine learning in the planning process. The latter helps to predict and mitigate supply chain disruption, again reducing the pain for airlines and OEMs.
Innovation is a continuous journey. We are constantly evaluating how to make the repair and overhaul processes more efficient and sustainable, especially as some steps are quite tough and labour intensive and involve chemicals that we are actively working to reduce or replace. These improvements not only benefit the environment but also enhance employee safety and reduce costs, savings that can be passed on to customers and invested in upskilling the workforce.

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Company profile

TP Aerospace: Simplifying Aircraft Wheel and Brake Solutions Globally
Founded in 2008 and headquartered in Copenhagen, Denmark, TP Aerospace has established itself as a leading aftermarket supplier of aircraft wheels and brakes. With a dedicated focus on this niche, the company offers comprehensive solutions that combine market expertise, extensive MRO capabilities, and a global footprint to deliver trusted, predictable and agile solutions to customers worldwide.
TP Aerospace operates a global network of MRO facilities across Europe, the USA, and Asia, strategically located to support airlines and maintenance providers efficiently. In 2023 TP Aerospace opened two new facilities. One being the new 10,000 sqm flagship MRO facility in Brno, the Czech Republic and the other in Brisbane, Australia, being the second establishment in Australia for TP Aerospace.
To address the diverse needs of the aviation industry, TP Aerospace has structured its operations into three synergistic divisions to become a true one-stop shop:

• **Programmes**: Offering tailor-made, all-inclusive solutions designed to simplify wheel and brake maintenance and repair activities. These programmes provide flexibility and cost transparency, with options like pay-per-landing models.
• **Components**: Maintaining the largest ready-to-go wheel and brake inventory in the aftermarket, this division supports customers with both routine and AOG (Aircraft on Ground) deliveries worldwide.
• **Distribution**: Providing airlines, repair facilities, and brokers with easy access to new OEM wheel and brake piece parts and assemblies across all major commercial platforms.
TP Aerospace's commitment to quality and service excellence is further exemplified through strategic OEM partnerships. Quality and safety are at the core of TP Aerospace's operations. The company holds certifications such as AS9120 Rev. B and ISO 9001:2015 across multiple sites, including Denmark, Singapore, and the USA. These certifications underscore TP Aerospace's dedication to maintaining the highest standards in its services and processes.

© Pem-Air Turbine Engine Services

How to Ensure Adequate Spare Engine Coverage

Exploring the most cost-effective ways of providing access to sufficient spare engines

By David Dundas

Effective spare engine coverage is essential for the smooth operation of any airline, but it comes at a cost. For example, the list price for a new Pratt & Whitney jet engine, such as the PW1100G for the Airbus A320neo, is typically around US$12 to US$15 million, while the list price for a new GE jet engine can range from US$14.5 million to US$42 million, depending on the specific engine model and its intended application. For example, the GE9X engine, intended for the Boeing 777X, has a list price of US$42 million. The LEAP-1A and LEAP-1B engines, used in Airbus and Boeing aircraft respectively, have a list price of US$14.5 million each. For those operators with large fleets, the number of spare engines required can tie up massive sums of money, thus leading to exploring pooling or leasing of engines as financially more viable options. We spoke to four MRO specialists on the topic of adequate spare engine coverage to get their opinion on the many challenges faced.

Why spare engine coverage is critical for airline reliability and operations

One has to accept that aircraft engines require long lead times for repair or replacement and while engine reliability is very high, there are occasions when engines suffer unscheduled removals. Even properly performing engines are scheduled for removal, based on pre-planned performance deterioration and life-limited parts expiration. Therefore, spare engine coverage is critical for airline reliability and operations, ensuring minimal disruption in the event of an engine failure or maintenance requirement. As John McCarthy, Director Business Development Europe, VAS Aero Services further explains, "An active spare engine programme allows airlines to quickly replace unserviceable engines and maintain schedules, thereby mitigating the risk an operator faces of prolonged AOG situations, flight delays, cancellations, and increased operational costs. Having a spare engine available reduces the financial impact of unplanned downtime and supports continuous service. Ultimately, it enhances an airline's resilience and operational continuity."

At AERO CARE, Managing Director Anca Mihalache sees spare engines as an unavoidable necessity, commenting that: "Depending on the size of the airline, having one or more spare engines is essential for

smooth operations. In most cases, serious on-wing engine repairs aren't possible, therefore, if an issue occurs, the engine needs to be replaced immediately. Having a spare engine available at base allows the airline to avoid extended aircraft downtime and reduces operational costs." Meanwhile, at AMROS Global, Oliver Boro, CAMO Technical Consultant Engines, sees flexibility as a key component when it comes to unscheduled engine removals. "Spare engine coverage is critical for airline reliability and operations because spare engines ensure aircraft remain airworthy even when standard engines are undergoing maintenance or are out of service. Spare engines provide flexibility in managing scheduled and unscheduled removals, preventing ground time and maintaining high levels of aircraft dispatch reliability," he advises.

Spare engine coverage is vital for maintaining continuous, reliable operations in commercial aviation as engines are routinely removed for scheduled maintenance—whether for periodic inspections, overhauls, or component replacements—and these planned removals occur much more often than unscheduled failures. Without a ready spare, even a scheduled removal can leave an aircraft grounded, disrupting the overall schedule and potentially impacting network connectivity. Virgil D. Pizer, Chief Executive Officer, Pem-Air Turbine Engine Services expands further: "Having a robust spare engine programme allows airlines to quickly swap out engines during routine maintenance without compromising the fleet's availability. This not only minimises aircraft downtime but also helps ensure that all engines meet strict regulatory standards and OEM maintenance requirements, keeping the fleet operating safely and efficiently. For smaller operators, with leaner fleets, the importance of spare engine coverage is even greater. With fewer aircraft, each engine loss—whether for planned or unplanned reasons—has a larger impact on overall operations. These operators must carefully balance the costs of holding spares with the risk of operational disruptions. In such cases, proactive planning, close coordination with MRO partners, and possibly exploring collaborative pooling arrangements become essential to manage both scheduled maintenance needs and unexpected events effectively. In short, spare engine coverage is not merely an inventory upfront—it's a strategic safeguard that enables smooth, uninterrupted flight operations by aligning maintenance schedules with immediate engine availability, ensuring continuous compliance and operational resilience."

Virgil D. Pizer, Chief Executive Officer, Pem-Air Turbine Engine Services

How to effectively forecast the need for spare aircraft engines for a fleet over time

Ultimately, forecasting spare engine needs effectively is a multi-faceted process that blends historical performance analysis with real-time data and statistical modelling. At its core, operators review past engine performance—tracking engine flight hours, cycles, and failure rates—to understand typical maintenance events and predict when an engine is due for overhaul or scheduled removals as dictated by OEM guidelines and life-limited part (LLP) schedules. Crucially, this forecasting isn't limited to planned or scheduled maintenance events. It must also account for unscheduled engine removals resulting from unexpected failures or anomalies. These unplanned events introduce an element of unpredictability and require additional safety buffers to ensure that spare engines are available when needed. By combining predictive maintenance technologies, such as sensor-based monitoring, with robust statistical models, operators can better estimate not only routine maintenance cycles but also the likelihood and impact of unforeseen events on spare inventory requirements. Virgil D. Pizer goes on to explain that the above comprehensive approach ensures that "spare engine coverage is aligned with both predictable and unexpected engine removals, allowing airlines to minimise operational disruptions while maintaining high safety and reliability standards." He continues:

"For smaller operators, unique challenges arise in this forecasting process:

• Data Limitations: With fewer engines in service, statistical models may be less robust, making it harder to predict failure rates and maintenance cycles with high confidence. Variability in engine usage or unexpected issues can have a larger impact on forecast accuracy.

• Economies of Scale: Smaller fleets often face higher per-engine costs for maintaining spares. The investment in advanced predictive analytics or condition-monitoring systems may represent a disproportionately large expenditure relative to the fleet, complicating efforts to optimise spare coverage.

• Logistical and MRO Dependencies: Limited in-house maintenance capabilities often mean that smaller operators must rely on third-party MRO providers. This can create timing and availability challenges, as spare engine forecasting must account not only for technical needs but also for potential delays in repair and replacement from external sources.

• Financial and Contractual Constraints: With reduced negotiating power compared to larger carriers, smaller operators may have less favourable terms for spare engine supply and maintenance contracts. This further complicates the ability to balance forecasted needs with budgetary and operational realities.

In summary, while all operators use a combination of historical analysis, OEM guidelines, and real-time data to forecast engine spares, smaller fleets face amplified

> ***"Having a robust spare engine programme allows airlines to quickly swap out engines during routine maintenance without compromising the fleet's availability."***
>
> *Virgil D. Pizer, Chief Executive Officer, Pem-Air Turbine Engine Services*

uncertainties and higher per-unit costs. These challenges necessitate a more agile and collaborative approach—such as pooling resources or leveraging integrated service agreements—to ensure that spare engine coverage remains robust and effective over time."

Oliver Boro provides us with a concise response, advising that: "Forecasting spare engine needs involves predicting the number of engines required to maintain operational readiness and minimise downtime. This is typically done by considering factors like fleet size, engine type, utilisation rates, spare engine ready when one fails, scheduled shop visits and turnaround time," while John McCarthy goes into greater detail, with an emphasis on data analysis. He explains: "Effective forecasting involves analysing a combination of operational data, maintenance schedules, and engine performance trends. Predictive maintenance tools and historical data are employed to anticipate engine removals due to wear, scheduled overhauls, or unexpected failures. Key factors in this analysis include fleet size, engine type, flight hours, cycles, and operational environments. By modelling these variables, operators can better predict when and how often engines replacements will be needed, and this leads to planning for spare engine acquisition, leasing, or pooling. Additionally, maintenance intervals, shop visit turnaround times, and logistics considerations should be factored in to ensure spare engines are positioned where and when they're most likely needed. Effective forecasting minimises aircraft-on-ground (AOG) risks, supports uninterrupted flight schedules, and optimises spare engine inventory investment."

How engine maintenance schedules influence the planning of spare engines

Here, Anca Mihalache sees an overall limit on engine availability as greatly affecting engine coverage options. She tells us that: "Even hospital shop visits can now take twice as long as they did in the pre-COVID era. There is a shortage of experienced repair specialists, and Broward Aviation Services [who Mihalache also advises] knows that spare parts are also harder to source. In the past, some MROs would offer a lease engine during the shop visit (some still do), or green-time and short-term lessors would step in. But with engine availability so limited today, even planned maintenance events can pose significant risk. Having one or more spare engines helps protect the airline's schedule." However, Oliver Boro sees things through a simpler lens as he explains: "Maintenance schedules are affecting effective spare engine coverage planning, as they directly influence the likelihood of future maintenance needs. By understanding the planned maintenance activities and their timing, airlines can predict potential spare engine requirements and manage inventory accordingly."

"Maintenance schedules are fundamental to spare engine planning because they set the predictable rhythm for when engines are removed for routine checks, overhauls, or other maintenance events. By knowing the timing of these scheduled removals—based on OEM guidelines, flight hours, and life-limited parts (LLP) cycles—operators can pre-emptively allocate spares to cover the inevitable gaps in service. At the same time, unscheduled removals due to unexpected failures or anomalies must be factored in, adding an element of uncertainty that requires additional buffers in the spare inventory. This combined approach, integrating both scheduled and unscheduled events through real-time data and predictive analytics, helps ensure that spare engines are always available to minimize downtime and maintain operational continuity," Virgil D. Pizer tells us, adding that: "For smaller operators, challenges intensify: with fewer engines in service, even a single unscheduled removal can have a significant impact. Limited data, tighter budgets, and less flexible MRO arrangements mean that they must carefully balance the costs of holding extra spares against the operational risks, often requiring more agile, collaborative, and finely tuned planning strategies."

Ultimately, John McCarthy makes it clear there is no 'one-size-fits-all' solution to this particular challenge, providing us with a detailed list of items that need to be taken into consideration when assessing the influence the effect maintenance schedules have on planning for spare engine coverage. He goes on to explain that: "Maintenance schedules play a key role in spare engine coverage planning by dictating when engines will be removed for routine inspections, overhauls, or performance restorations. The timing and duration of shop visits directly influence how many spare engines are needed and when, if multiple engines are due for overhaul simultaneously, additional spares must be available to maintain operational continuity. Airlines must also consider variability in turnaround times at maintenance facilities, which can extend the period an engine is out of service. Coordinating maintenance schedules across the fleet helps optimise the use of spares and prevents excess inventory. Effective planning around maintenance schedules ensures high fleet availability and minimises costly disruptions."

Factors which have to be considered when deciding how many spare engines are required

Determining the right number of spare engines involves a careful balance

> ***"By understanding the planned maintenance activities and their timing, airlines can predict potential spare engine requirements and manage inventory accordingly."***
>
> *Oliver Boro, CAMO Technical Consultant Engines, AMROS Global*

Oliver Boro, CAMO Technical Consultant Engines, AMROS Global

of technical, operational, and economic factors. Operators start by looking at engine utilisation—tracking flight hours and cycles—to understand how often engines are removed, either for scheduled maintenance (such as routine inspections, overhauls, or cyclical component replacements) or unexpected, unscheduled repairs. A longer turnaround time for repairs means more engines will be out of service, so inventory levels need to cover those gaps. Virgil D. Pizer then tells us that: "Reliability trends and predictive maintenance analytics play a big role, too. They help forecast when an engine might drop below performance thresholds, triggering maintenance actions, whether planned or unexpected. OEM maintenance guidelines, including life-limited part (LLP) replacement schedules, add a structured basis for determining how many engines will likely be in maintenance at any given time. All these factors help operators balance the cost of holding spares against the risk of operational downtime. For smaller operators, these issues become even more critical. With fewer engines in the field, each unscheduled event or maintenance slot represents a larger impact on overall operations. Limited data, higher per-unit costs, less flexibility in coordinating with third-party MROs, and reduced bargaining power often force a more conservative, agile approach to spare inventory planning—sometimes making collaborative pooling arrangements an attractive option."

John McCarthy also sees a number of critical elements that need to be taken into consideration, including financial constraints and capital investment. He advises: "When determining the number of spare engines to carry in inventory, several key factors must be considered, starting with regulatory requirements and manufacturer recommendations which provide the base guidelines for spare engine inventory. After that, fleet size and engine type influence demand; larger fleets or engines with known reliability issues may require more spares. Maintenance schedules and turnaround times are critical factors, too, as longer repair times increase the need for readily available replacements. Geographical distribution impacts spare inventory levels — airlines with global routes may need spares positioned strategically across different regions. Additionally, things like historical failure rates and utilisation patterns, procurement lead times, and storage and logistics capabilities should be considered. Finally, financial constraints and capital investment considerations play a role, as engines are high-value assets, and excessive spares tie up significant resources. Balancing availability with cost is key to efficient spare engine management."

"Several factors determine the required number of spare engines for an airline fleet, including engine failure rates, fleet utilization, repair times, and the desired level of availability. Common airline industry benchmark is 10% spare engine ratio which means an airline aims to have one spare engine for every ten engines installed on their aircraft fleet. This ratio helps ensure operational reliability by providing backup in case of engine removal for scheduled or unscheduled event. Airlines with specific routes or operational needs may require

> ***"Where to position spares is determined by flight routes, maintenance hub locations, and historical engine removal data. The first step is to position engines at bases and out stations where aircraft maintenance will be conducted."***
>
> *John McCarthy, Director Business Development, VAS Aero Services*

John McCarthy, Director Business Development, VAS Aero Services

more spares," says Oliver Boro, while Anca Mihalache provides a succinct answer that focuses on two aspects. "The main considerations include fleet size and the number of scheduled maintenance events. The type of operation and access to external leasing or pooling options also play a role," she says.

How the logistics of engine positioning should be managed to ensure adequate coverage

For operations, managing engine positioning is about being in the right place at the right time—whether the engine is scheduled for routine maintenance or removed unexpectedly. Virgil D. Pizer at Pem-Air Turbine Engine Services provides a more practical breakdown:

• Strategic Placement for Scheduled Maintenance: When engines are scheduled to come off-wing for regular inspections or overhauls, having spares pre-positioned at your major maintenance bases or hubs means your fleet doesn't suffer downtime. Scheduled removals can be forecasted well in advance using OEM guidelines and maintenance schedules, so planning for these events by stocking spares at locations close to your repair centres makes the swap faster and keeps your flights on time.

• Flexibility for Unscheduled Events: In addition to scheduled maintenance, unscheduled removals—like an unexpected fault detected during flight or on the ground—must be quickly addressed. Real-time tracking and a well-distributed network of spare engines ensure that when an engine is removed unexpectedly, you don't scramble for a replacement. This requires robust logistics coordination with carriers, MRO partners, and transport providers.

He further points out that practical challenges for smaller operators arise as every spare engine represents a significant investment. Smaller operators face tighter budgets and typically have fewer maintenance bases. This means:

• Lean Inventory Management: Spares must be carefully positioned to cover both scheduled maintenance and potential unscheduled events—often relying on regional partnerships or shared pools with similar carriers.

• Optimized MRO Coordination: With fewer assets and sometimes longer turnaround times at third-party MROs, smaller operators need to secure firm contractual commitments on repair lead times and use just-in-time logistics to minimise idle spare engines.

• Adaptability: Smaller fleets have limited flexibility, so planning for spares involves not just inventory but also contingency arrangements that allow rapid engine redistribution or leasing if needed.

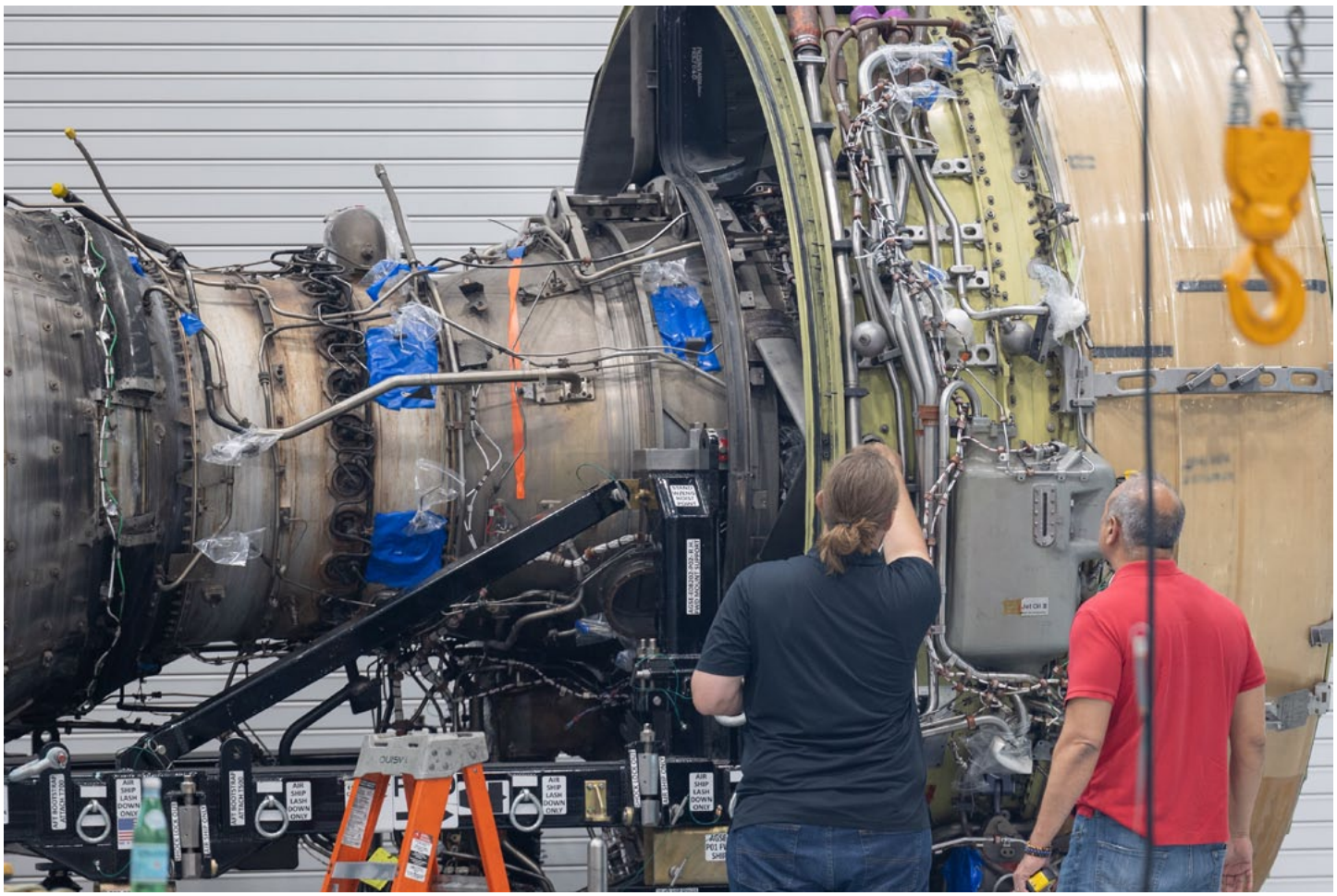
Pizer then concludes: "In summary, effective logistics for engine positioning is about aligning spare engine availability with both predictable scheduled maintenance and unpredictable unscheduled removals. By ensuring spare engines are strategically located, tracked in real time, and coordinated closely with repair facilities, operators can minimise disruptions—while smaller operators must carefully balance limited resources and partnerships to maintain the same level of reliability."

Oliver Boro at AMROS Global and Anca Mihalache at AERO CARE share similar thoughts on the subject, with Boro commenting that: "Aircraft spare engines should be stored in a combination of strategic locations and with robust logistical support. This includes strategically located warehouses, potentially with specialized engine handling and storage capabilities, as well as leveraging pool agreements with possibility of prioritised engine pool access," while Mihalache backs this up by advising us that: "Aircraft spare engines should be stored in a combination of strategic locations and with robust logistical support. This includes strategically located warehouses, potentially with specialized engine handling and storage capabilities, as well as leveraging pool agreements with possibility of prioritised engine pool access."

To conclude, John McCarthy at VAS Aero Services sees a multi-prong approach to the problem as optimal. He advises: "Where to position spares is determined by flight routes, maintenance hub locations, and historical engine removal data. The first step is to position engines at bases and out stations where aircraft maintenance will be conducted. Those locations, with qualified crews and all the necessary support tooling capabilities, can conduct scheduled removals and troubleshooting removals overnight, reducing operational impact. Close collaboration with MRO providers and transport services is also needed to coordinate rapid deployment and provide sufficient geographic coverage. Real-time tracking systems help monitor engine movements and availability. Inventory levels at each location should be regularly reviewed and adjusted based on seasonal demand, fleet changes, and operational data. Contingency plans, including access to leased engines or partner airline support, should be in place to handle unexpected failures or delays."

The pros and cons of purchasing spare engines versus using pooling arrangements or leasing

Operational decisions on spare engine strategy revolve around choosing between purchasing, leasing, or pooling arrangements. When an operator buys spare engines, it ensures immediate



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availability and complete control over deployment, which aligns well with scheduled maintenance and unexpected removal needs. However, this approach ties up significant capital, carries risks of depreciation and obsolescence, and can reduce flexibility when fleet demands evolve. Leasing spare engines reduces the upfront investment and allows easier access to newer models, providing predictable expenses over time, but it often comes with contractual restrictions and a dependency on lease terms that may limit operational responsiveness. Pooling spare engines through shared arrangements offers cost sharing and a larger, more flexible inventory that can better absorb demand fluctuations, though it requires complex logistics, coordinated agreements among multiple parties, and results in less direct control over the assets.

Virgil D. Pizer suggests that specific considerations for smaller operators are needed as every engine represents a significant investment. He details these as follows:

• Capital Constraints: Smaller fleets may find purchasing outright cost prohibitive, pushing them toward leasing or pooling to manage cash flow.

• Operational Impact: A single engine outage has a larger operational impact on a small fleet, making reliable spare coverage absolutely critical.

• Negotiation Leverage: Smaller operators might have less bargaining power when leasing or entering a pooled arrangement. They need to carefully assess contractual terms to ensure that spare availability aligns closely with their maintenance schedules.

• Strategic Partnerships: For these operators, pooling arrangements can be particularly beneficial, as they can tap into a broader pool of resources and share the risk with other carriers, thereby minimizing the impact of an unscheduled engine removal.

He summarises the situation as follows: "...while purchasing offers total control and immediate availability, it requires heavy spending and bears the risk of asset underutilisation. Leasing provides financial flexibility and easier upgrades but often comes with restrictions and contractual challenges. Pooling can offer a cost-effective, flexible alternative—though it demands coordinated logistics and may reduce direct operational control. Each option should be evaluated based on the operator's fleet size, financial health, and operational priorities."

John McCarthy looks at several influential factors and concludes that a combination of options may well be the most beneficial. "The key variables in this discussion lie along two primary axes: financial versus operational priorities, and the size and age of the fleet. Another critical factor is where the airline stands within its engine maintenance cycle—whether it is facing a high rate of shop visits or operating at a more moderate maintenance tempo. In general, there is a strong case for a hybrid strategy that combines owned engines with leased or pooled assets. Over the years, some airlines have achieved exceptional engine readiness by leveraging highly experienced, cross-functional teams—bringing together engineering, commercial, and financial expertise to align operational needs with cost-effective solutions. Ultimately, the choice depends on the airline's size, route structure, financial strategy, and risk tolerance. A blended approach often provides the best balance of cost and coverage," he says.

Anca Mihalache understands the paradox perfectly as she points out that

"Pooling agreements are typically faster, as contracts, lease rates, and maintenance reserves are already negotiated. Green-time or short-term leasing also moves quickly, but with limited engine availability, especially for legacy narrowbodies, this might not be a feasible solution. Owning spare engines requires upfront investment and tying up capital, but it also gives the airline full control and avoids long AOG delays when an engine issue occurs." To conclude, Oliver Boro sees advantages and disadvantages with all three options, advising that "Airlines face the eternal dilemma when managing spare aircraft engines: whether to purchase them outright, utilise pooling arrangements, or opt for leasing. Each option presents advantages and disadvantages, impacting cost, risk, and operational flexibility. Owning spare engines provides the most control and immediate access but requires significant upfront investment and ongoing maintenance costs. Leasing spare engines offers flexibility and can be more cost-effective, especially for airlines with fluctuating maintenance needs. Pooling arrangements aim to reduce costs and improve availability through shared resources. A hybrid approach is a combination of owned and leased spares allows airlines to optimise their resources based on specific operational requirements and financial constraints. Some companies specialise in providing spare engine solutions, including lease pools and on-demand access to engines. The best choice depends on specific needs, including budget, desired flexibility, and risk tolerance."

Anca Mihalache, Managing Director, AERO CARE

Contingency plans that should be in place for multiple engine failures

For operators, a robust contingency plan for multiple engine failures means having every link of the response chain prepared before, during, and after an event. It starts with pre-event measures like regular emergency training and simulating multiple-engine failure scenarios, so crews and maintenance teams know exactly how to react. Real-time communication protocols must be established so that as soon as the failures are detected, the operations centre, flight crews, and maintenance teams are in sync. This enables dynamic decision-making: pilots can safely manage degraded operations while ground teams rapidly mobilise spare engines, Virgil D. Pizer informs us. He then explains further that: "Logistically, spare engines must be strategically pre-positioned at maintenance hubs and key regional locations to allow for quick swaps, whether the engine is out for a scheduled maintenance check or an unforeseen failure. Pre-negotiated agreements with MROs and leasing partners add another protection layer, ensuring that if multiple engines need replacing, there are mechanisms in place to expedite repairs and temporary replacements. These coordinated steps ensure minimal disruption and safety are maintained across the fleet. For smaller operators, where each engine is a critical asset, the plan must include additional contingency measures such as regional partnerships, shared pooling arrangements, and even tighter contractual support from MRO providers. This ensures that even with limited resources, the operator can handle simultaneous engine failures without significant operational impact."

Meanwhile, John McCarthy hits the nail very firmly on the head as he comments: "That's every operator's nightmare, isn't it? Ensuring your team can respond quickly and effectively to simultaneous failures requires anticipating and planning for the worst-case scenario. The much-used phrase applies here, 'fail to plan, plan to fail'. A solid advance plan, developed by the teams using all the levers available will keep the operation going with limited impact to service. With multiple failures in succession, the goal is to minimise the damage to operations. Elements of the plan include tracking available lease engines, having established pre-agreed contracts and arrangements with engine lessors and other partner airlines, having solid relationships with engine MRO's to access their spare engine pools, and having access to and the ability to wet lease a covering aircraft. Pre-arranged leasing contracts and strong partnerships with suppliers like VAS Aero Services can result in quick sourcing and minimize downtime. All of these elements need to be in place to prepare you for a multiple failure event. As an aside, over years in powerplant management, I have come to believe that when you install your last spare, the next failure is 24 hours away. Sometimes it just seems like 'the engines know'. Effective engine management is a combination of the science of planning with the art of balance from experience."

Both Anca Mihalache and Oliver Boro come up with a range of possible options, with Boro advising that these can include:

- Implement a comprehensive maintenance schedule and reliability programme that includes regular inspections, preventative maintenance, and timely repairs to minimize the risk of engine failures.
- Consider short-term leases as a temporary solution to cover engine failures, especially when spare engines are unavailable or repairs are delayed.
- Maintain a sufficient stock of spare engines to cover potential failures, considering factors like fleet size, engine type, and failure rates.

To conclude, Mihalache explains that: "A strong contingency plan includes a mix of owned spare engines, pooling agreements, and good relationships with short-term lessors. Equally important is a reliable maintenance team that can plan ahead and build realistic timelines to mitigate operational risks."

> ***"A strong contingency plan includes a mix of owned spare engines, pooling agreements, and good relationships with short-term lessors."***
>
> *Anca Mihalache, Managing Director, AERO CARE*

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The Challenges Facing Aircraft Mechanics in Relation to Defect Troubleshooting: Precision, Pressure and Progress

By David Dundas

There is one specific role associated with all aircraft mechanics (aircraft maintenance technicians / AMTs or licenced engineers) and that is to ensure flight safety. Beyond that, they are also responsible for operational continuity. It is a highly challenging role that comes with its own set of unique pressures, and one particularly unique aspect of aircraft mechanics is defect troubleshooting, in other words, the process of identifying, isolating, and rectifying faults across a wide range of mechanical, electrical, and electronic systems.

In order to meet such a challenge, mechanics need to have a wealth of training behind them, state-of-the-art tools, and a varying degree of experience, yet the high-stakes aspect of their work is subjected to the increasing complexity of modern aircraft, time pressures, data interpretation difficulties, and the interplay between human judgement and automated systems. In the following, we want to explore the key challenges facing aircraft mechanics when it specifically comes to defect troubleshooting.

The Complexity of Aircraft Systems

Modern commercial aircraft are extraordinarily complex machines. With integrated avionics, fly-by-wire controls, modular systems, and digital diagnostics, the boundaries between mechanical and electronic faults are becoming increasingly blurred. For example, mechanics have to contend with multiple interconnected systems where a defect in one area can manifest symptoms elsewhere, advanced composite structures and newer systems (e.g., electrical environmental control systems, B787's no-bleed architecture) that require specialised knowledge, while not forgetting about varied aircraft types and configurations, especially within mixed-fleet airlines. In order to effectively troubleshoot problems in such an environment, mechanics need to have exceptional knowledge and understanding of specific aspects of an aircraft, access to volumes of comprehensive and detailed technical documentation, and critically, the skills to accurately interpret fault logic pathways.

Intermittent and Non-Reproducible Faults

Some faults that occur in an aircraft aren't always frequent and, as a direct consequence, such instances can be difficult to reproduce when the aircraft are on the ground. Examples of such occurrences include electrical faults that only occur in flight due to vibration, pressure, or temperature, data bus interruptions that briefly trip warnings without leaving a trace, and cabin pressure fluctuations

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or ECAM/EICAS alerts with no apparent mechanical root cause. Consequently, mechanics must often rely on pilot reports, flight data logs, and fault history—all of which may be incomplete, vague, or inconclusive, while a "No Fault Found" (NFF) scenario is frustrating for technicians and also costly for operators. In such cases, mechanics must balance operational risk with engineering judgement, sometimes releasing aircraft under MEL (Minimum Equipment List) provisions until a more definitive solution can be found.

Limited Access and Troubleshooting Constraints

As many of you know, there are locations in an aircraft that are particularly difficult to access and as a direct consequence, this can make physical accessibility to some components a major challenge. The outcome can mean that it can take several hours of disassembly before a part can even be inspected or replaced. Such scenarios include wiring bundles behind sidewalls or overhead panels, fuel or hydraulic lines located in wings or centre tanks, and avionics equipment located in confined electronic bays. Beyond this, certain systems can only be effectively tested under certain conditions, i.e., pressurisation or airspeed, which means that ground-based troubleshooting can be less effective. Ultimately, mechanics will often have to make judgement calls based on incomplete access or simulated conditions that are as close to a real-life scenario as possible, sometimes being forced to rely on specialised ground support equipment (GSE) or test rigs.

Constant Pressure of Time and Turnaround

To say that airlines operate under very tight schedules would be an understatement and, as a consequence, mechanics are frequently under immense pressure to resolve defects quickly during limited ground time, particularly in turnarounds or overnight maintenance windows. What can be the result of such pressure? Deferred maintenance via an MEL, temporary fixes instead of full component replacements, and not forgetting increased stress, fatigue, and potential for oversight. Finding an acceptable balance between safety, compliance and on-time performance will always be a challenge, where maintenance control centres, line supervisors, and engineering departments need to collaborate closely to support mechanics.

Technical Documentation and Diagnostic Tools

While the MRO sector is undergoing the transformation to becoming a more digitised environment, the legacy of older, paper-based documentation still remains. Thus, today's aircraft are still supported by vast physical libraries of technical manuals, maintenance documents, and fault isolation procedures. However, problems can exist where fault isolation manuals (FIMs) and maintenance task cards can be overly rigid or based on ideal conditions, electronic troubleshooting tools (e.g. BITE test systems, CMCs) can often provide fault codes without context, and mechanics may struggle with information overload or inconsistent terminology between aircraft types and OEMs. Beyond this, certain digital tools require a level of system understanding that even experienced technicians may not possess without recent type-specific training.

Training and Skill Gaps

Aircraft systems are becoming more software driven and thus mechanics have to develop new hybrid skills to enable them to deal with current mechanical systems, digital signal interpretation, electrical and electronic diagnostics, and human factors

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and systems thinking. However, not all training programmes evolve at the same pace as technology, and as a direct result there are ongoing gaps in type-specific troubleshooting techniques (especially for new aircraft like the A350 or B787), the interpretation of digital fault data, and the practical application of OEM-provided maintenance tools. Therefore, continuous learning has become essential, but it is frequently underfunded or deprioritised in high-demand operational environments.

Communication and Human Factors

Where aircraft parts troubleshooting is concerned, this task is rarely a solo undertaking and more usually involves collaboration between engineers and pilots and flight crews who report anomalies, maintenance controllers and engineers who provide technical support, and inventory and logistics personnel for coordinating parts availability. However, breakdowns in communication—whether due to unclear pilot write-ups (PIREPs), jargon misunderstandings, or cultural/language differences—can have a negative effect on troubleshooting. Beyond this, human factors such as fatigue, workload, environmental conditions (heat, cold, noise), and even team dynamics can all influence the success of defect troubleshooting.

Emerging Technologies and Future Solutions

While it may seem that changes such as digitisation of records and the introduction of new materials all add to the knowledge and experience bank that top mechanics need, and therefore create additional pressures, there are also new tools that advanced technologies are developing that will make the life of an aircraft mechanic easier when it comes to troubleshooting activities. These include predictive maintenance platforms like Skywise, Boeing AnalytX, and Honeywell Forge which help to identify likely component failures before they occur, augmented reality (AR) headsets and mobile tablets offer mechanics real-time access to schematics and repair procedures, remote support technologies allow mechanics to consult OEM experts or engineers via video links while working on aircraft, and AI-enhanced diagnostic tools which are being trialled to interpret fault codes and propose likely root causes, especially for repeated or ambiguous defects.

To Conclude

Aircraft defect troubleshooting is a blend of science, art, and experience. Mechanics must balance technical precision with operational urgency, and individual judgement with system-based guidance. Thus, as aircraft continue to evolve, so too must the skills, tools, and support structures available to those responsible for their upkeep. The challenges are significant—ranging from intermittent faults and system complexity to time pressure and training gaps—but so are the opportunities. However, with the right investment in technology, human capital, and cross-functional collaboration, the future of aircraft defect troubleshooting promises to be more proactive, intelligent, and efficient than ever before.

From Reactive Repairs to Predictive Precision

The Evolution in Aircraft Component Maintenance

By David Dundas

The maintenance of aircraft components has undergone a dramatic transformation over the past few decades. Once dominated by reactive repairs and time-based overhauls, modern component maintenance now relies heavily on data analytics, advanced materials, modular design, and predictive technologies. As the aviation industry grows increasingly focused on cost-efficiency, safety, and reliability, the maintenance of components—ranging from avionics to actuators—has become a critical focal point for innovation. So, let us explore how aircraft component maintenance has changed, examine the technologies driving these changes, and the strategic implications for airlines, MROs, and OEMs alike.

Traditional Practices: Scheduled and Manual

Historically, aircraft component maintenance followed a time-based or usage-based schedule where components were removed, overhauled, or replaced at set intervals, regardless of their actual condition. This was driven by airworthiness directives (ADs) and OEM guidelines, limited diagnostic capabilities, and conservative risk-mitigation philosophies. Components such as hydraulic pumps, electric actuators, air cycle machines, and avionics were typically sent to overhaul shops after a predefined number of flight hours or cycles, so the result was a predictable but often inefficient system, with components either replaced too early or failing between scheduled intervals.

The Shift to Condition-Based Maintenance

With the advent of onboard sensors, digital monitoring, and centralised maintenance information systems, the industry has begun to transition toward Condition-Based Maintenance (CBM) which focuses on maintaining components when data indicates performance degradation or impending failure. Key enablers include Built-in Test Equipment (BITE) that monitors system health in real time, Central Maintenance Computers (CMC) that log fault codes and system status, and Aircraft Health Monitoring Systems (AHMS) that aggregate component-level data. This shift has enabled maintenance teams to extend component life, reduce unnecessary removals, and prioritise interventions based on actual wear or fault data which has significantly lowered maintenance costs and improved fleet availability.

Modular Design and Line-Replaceable Units (LRUs)

Aircraft component maintenance has also evolved through design philosophies that favour modular architecture, primarily because modern aircraft systems are built with Line-Replaceable Units (LRUs), enabling quick removal and replacement at the line or hangar level. To explain further, the advantages of LRU-based maintenance include rapid turnaround times during unscheduled events, reduced aircraft-on-ground (AOG) durations, and simplified logistics and parts inventory management. Common LRUs include avionics modules, electronic controllers, hydraulic actuators, and power distribution units, while once removed, LRUs are sent to a repair station or OEM-authorised workshop for in-depth troubleshooting and refurbishment.

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Predictive Maintenance: The Digital Frontier

The most recent and impactful transformation is the rise of Predictive Maintenance (PdM) where through the use of advanced analytics, machine learning, and vast operational datasets, predictive maintenance tools are now able to accurately forecast the future condition of components based on current trends. Examples of this include engine components which are now being monitored for vibration and temperature patterns to predict hot-section wear, hydraulic pumps or valves which are being analysed for pressure deviation trends, and environmental control systems which are now tracked for performance drops linked to filter clogging or motor wear. Thanks to the introduction of PdM, leading OEMs and airlines now use platforms such as Airbus Skywise – centralised analytics for component-level trend monitoring, Boeing AnalytX – predictive tools for system reliability and parts planning, Honeywell Forge and GE's Predix – advanced diagnostics for avionics and engines. What this all means is that these tools allow for component removal just prior failure, enabling proactive parts ordering and maintenance slot scheduling, which in turn leads to a more reliable and cost-effective maintenance regime.

Material Science and Component Durability

Parallel to digital innovations, advancements in materials have also significantly improved component reliability as these components often incorporate composite and ceramic materials for reduced weight and improved heat resistance, self-lubricating bearings that reduce maintenance intervals, and corrosion-resistant alloys extending component service lives. Beyond this, the use of additive manufacturing (3-D printing) for certain component parts has allowed MROs and OEMs to rapidly produce customised or low-volume parts for repair, particularly for older aircraft.

Regulation and Certification

Despite the above-mentioned innovations, aircraft component maintenance remains strictly regulated, so any shift in maintenance methodology—particularly when incorporating predictive tools—must align with FAA and EASA maintenance programmes, including Part 145 repair station approval, OEM-issued Component Maintenance Manuals (CMMs), which define overhaul procedures and tolerances, and reliability control programmes within an airline's Continuing Airworthiness Management Organisation (CAMO). Recent regulatory developments are increasingly accommodating digital methods, but full integration of AI-driven predictions into certified maintenance planning still requires rigorous validation and audit trails.

The Role of OEMs and Third-Party MROs

OEMs have steadily increased their presence in component maintenance, offering power-by-the-hour (PBH) or flight-hour-based service contracts that bundle maintenance, spares, and reliability guarantees. This has changed the economics and structure of the component MRO market. However, independent MRO providers continue to offer flexible, cost-effective options for airlines not tied to OEM service programmes and these shops increasingly invest in component test benches for automated diagnostics, repair engineering teams to develop DER

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(Designated Engineering Representative) repairs, and inventory pooling and exchange programmes to reduce lead times. The result is a more competitive and globalised component maintenance market, with U.S., European, and Asian players all vying for contracts across fleets and geographies.

Challenges and the Road Ahead

Despite the major advances made in aircraft component maintenance, several challenges still remain. For example, data integration between aircraft, MROs, and OEMs remains fragmented. Beyond this, cybersecurity is a growing concern as predictive tools rely on cloud infrastructure and shared operational data, and there is still a skills gap in understanding digital diagnostics and software-driven systems among traditional maintenance personnel. However, looking forward, component maintenance will continue to evolve with trends such as digital twins for individual components, blockchain for component tracking and maintenance history, and autonomous inspection robots and remote diagnostics.

In Conclusion

The evolution of aircraft component maintenance is a story of convergence—where engineering tradition meets digital transformation. From fixed schedules to predictive insights, and from mechanical overhauls to software updates, the landscape has changed dramatically where Airlines, OEMs, and MRO providers who embrace this evolution are now better positioned to ensure not only cost efficiency and operational readiness but also safety and compliance in an increasingly complex aviation ecosystem. As aircraft technology continues to advance, so too must the philosophy, tools, and skills behind component maintenance, so the future is not just about fixing what breaks, but also predicting and preventing failure—before it even happens.

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PEOPLE

on the move

Kriti Sharma

IFS has named **Kriti Sharma** as Chief Executive Officer of IFS Nexus Black, a strategic move that underscores the company's ambition to lead in the field of Industrial AI. Nexus Black, launched earlier this year, serves as IFS's dedicated AI innovation accelerator, focused on developing agentic AI systems tailored to complex, asset- and service-intensive industries. Sharma is a highly respected figure in the AI sector, recognised globally for her work in enterprise AI and responsible AI development. Her previous roles include Chief Product Officer for LegalTech at Thomson Reuters and senior AI positions at Sage Group and GfK. She also sits on the board of Rightmove PLC. Her contributions have earned her accolades such as Forbes 30 Under 30, the UK Prime Minister's Points of Light award, and recognition from the United Nations as a Young Leader for ethical AI. In her new role, Sharma will spearhead the creation of contextual, domain-specific AI applications for industries such as energy, manufacturing, aerospace, and construction. She emphasises that the true potential of AI lies in solving industry-specific challenges, such as predicting asset failures and optimising global supply chains, stating: "The revolution happens with contextual, agentic AI that solves deeply complex, industry-specific problems." Joining Sharma is **Nick Vandivere** as Chief Innovation Officer of Nexus Black. He will focus on pioneering use cases and expanding IFS's Industrial AI pipeline, leveraging his experience from Thomson Reuters to support Sharma in accelerating AI innovation across the IFS Cloud platform. IFS CEO Mark Moffat hailed the appointments as a pivotal moment in the company's AI journey, affirming that IFS is committed to delivering intelligent automation and real-world AI solutions tailored to the critical infrastructure sectors it serves.

Giovanni Tomassini

Baykar Piaggio Aerospace S.p.A., the newly formed company that has assumed the business assets of Piaggio Aero and Piaggio Aviation following a period of extraordinary administration, has officially appointed **Giovanni Tomassini** as its new Chief Executive Officer (CEO). Tomassini, who has served as Chief Operating Officer, steps into the top role as the company prepares to enter a new chapter under the ownership of Turkish aerospace company Baykar. Tomassini holds a master's degree in mechanical engineering from the Politecnico University of Milan. He began his career at Ansaldo Sistemi Industriali and later joined Aermacchi, where he held the position of Production Manager. Tomassini has been with Piaggio Aerospace since 2009 and has played a significant role in its operations over the past decade. **Haluk Bayraktar**, CEO of Baykar and Chairman of the Board at Baykar Piaggio Aerospace, described the appointment as "a choice of continuity and trust in the competences of the current management." Bayraktar emphasised that, following years of extraordinary administration, the company is ready to relaunch with a renewed industrial vision. This strategy aims to merge Piaggio Aerospace's heritage in Italian aviation with Baykar's innovative technologies and global experience in aerospace development. Tomassini's leadership is expected to be central to this transformation, as the company seeks to establish itself as a competitive force in the international aerospace sector. His experience and familiarity with Piaggio's operations are seen as essential in steering the company towards a future marked by industrial revitalisation and global expansion.

PEOPLE

on the move

Denise Mangan-Fahy

Denise Mangan-Fahy has been confirmed as the next Chief Executive Officer (CEO) of Shannon Engine Support (SES), an organisation jointly owned by AerCap and Safran Aircraft Engines, which specialises in providing spare engine leasing solutions to businesses around the globe. She will assume the role in September, succeeding **Julie Dickerson**, who is retiring after successfully leading the business for more than a decade. Mangan-Fahy has worked in the aerospace industry for 35 years, beginning her career with Shannon Aerospace before joining GE Capital Aviation Services (GECAS) in 1998 as Vice President of Engine Management. She rose to Senior Vice President of Portfolio and Rental Operations in 2018. Following AerCap's acquisition of GECAS from GE in 2021, she became Head of Portfolio & Rental Operations for AerCap Engines. Mangan-Fahy takes over from Dickerson at a time when the business has grown into one of the true leaders in its field, delivering CFM engines—including the CFM56 and LEAP engine—to airline customers worldwide. The organisation aims to have 700 engines under management by the end of 2025, increasing to up to 900 by the end of 2028.

Holger Sindemann

N3 Engine Overhaul Services, the joint venture between Lufthansa Technik AG and Rolls-Royce, has announced a leadership change at its Arnstadt site. **Holger Sindemann** has been appointed Director and General Manager on behalf of Rolls-Royce, assuming responsibility for the company's operational activities. As the accountable manager, he also serves as the primary liaison with the German Federal Aviation Authority. Sindemann succeeds **Carsten Behrens**, who departed the company as scheduled after three years in the role. With nearly 20 years of executive experience in the aerospace industry and a decade as a strategic consultant, Sindemann brings a wealth of expertise to the position. He holds a degree in mechanical engineering from RWTH Aachen University. In line with the structure agreed upon by the parent companies, N3's leadership is comprised of two representatives – one focused on operations and the other on commercial matters. The current management board consists of Holger Sindemann and **Stefan Landes**, Commercial Director, operating on an equal footing. As part of its expansion, N3 is not only enlarging its facilities but also creating new career opportunities. The company welcomes applications from both skilled professionals and those seeking a career change. Its internal training programme is specifically designed to help individuals without aviation experience transition into the field of engine overhaul. N3 launched its ambitious xDREAM growth programme in 2022 following an agreement between Lufthansa Technik and Rolls-Royce to expand operations in Thuringia. This includes enlarging the existing plant and building a dedicated logistics centre. The goal is to boost the company's capacity to at least 250 Rolls-Royce Trent engine overhauls per year.