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MRO 360°

Mastering Complexity

Trends in component management and the supply chain

Designing Lifecycle Strategies
Introducing Aeras Aviation

Pitfalls and Hurdles
Transition management for leased aircraft

Maintenance Mythbusters
If it looks fine, it probably is fine

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Dear Industry Colleagues,

Once again many of us are being faced with unexpected challenges brought about by world events. Over the next few weeks how those challenges manifest themselves and affect the MRO sector will likely be revealed.

In the meantime, as some aircraft routes are suspended and others altered to take into account the current conflict in the Middle East, MRO operatives, as always, will have to remain flexible and reactive to changing demands. That said, the nature of the work will never stop, it is just how we do it that changes most over time.

This month we decided to take a closer look at Trends in Component Management and the Supply Chain as the ever-changing challenges the MRO sector is forced to deal with can make component management seem like you are playing three-dimensional chess on a board made of moving sand.

In our second feature article, we wanted to delve deeper into the complex world of Transition Management for Leased Aircraft to get a much clearer picture of what is required, and why, before returning an aircraft to its lessor. It may be a surprise to discover just how much is involved, and when the optimum time is to begin the process.

Beyond the above, this month's Mythbuster – If it Looks Fine, It Probably is Fine – looks into just how much you can trust purely from a visual inspection of an aircraft and if there is still a role for the critical eye of an experienced aircraft mechanic.

As always, I hope you enjoy this month's issue.

Torsten Tamm
Publisher

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Mastering Complexity

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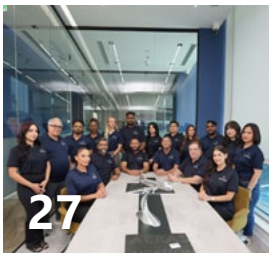

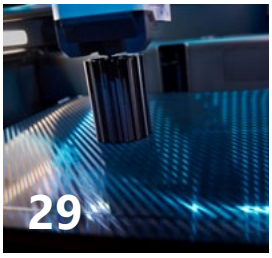

Delta TechOps broadens LEAP engine support capability

With demand for narrow-body aircraft continuing to surge, Delta TechOps has expanded its CFM International LEAP engine portfolio, becoming the first and only North American airline maintenance, repair and overhaul (MRO) provider licensed to support both the CFM LEAP-1A and CFM LEAP-1B engines. The addition of full overhaul capability for CFM LEAP-1A engines further strengthens Delta TechOps' position as a global leader in next-generation engine maintenance for the world's most advanced narrow-body fleets. Delta TechOps is among a select group of CFM Premier MRO providers for the LEAP engine family — a distinction reflecting CFM's confidence in TechOps' technical depth and consistent performance. Delta TechOps was named a CFM Premier MRO provider for LEAP-1B engines in 2022, becoming the first North American MRO to earn the designation. As part of this elite global network, Delta delivers high-quality solutions built on the precision, consistency and operational rigour required for the industry's most advanced narrow-body engines. "As the LEAP fleet grows, operators need more options and Delta is ready to help meet that demand with capability across both LEAP-1A and LEAP-1B engines," said Marc Meredith, Chief Commercial Officer for Delta TechOps. "Delta technicians are the best in the business. The unmatched care they show for our airplanes is exactly what our customers can expect — quality and performance operators need to keep aircraft flying." CFM LEAP engines power the Airbus A320neo family (LEAP-1A) and serve as the exclusive powerplant for the Boeing 737 MAX 10 (LEAP-1B), for which Delta has ordered 100 aircraft, with deliveries set to begin once the model receives certification.

Delta TechOps to support both the CFM LEAP-1A and CFM LEAP-1B engines *© CFM International*

TAT secures US$36m APU MRO contract with global cargo carrier

TAT Technologies has secured a US$36m APU MRO contract *© TAT*

TAT Technologies (TAT), a supplier of products and services to the commercial and military aviation sectors as well as the ground defence industry, has signed a new agreement with a major global cargo airline to provide maintenance, repair and overhaul (MRO) services for two auxiliary power unit (APU) platforms. The combined estimated value of the contract is approximately US$36 million. The agreement includes two components. The first is a two-year extension of TAT's existing contract to provide MRO services for the GTCP331-200/250 APU platform, with an estimated value of around US$22 million. The second is a new agreement covering MRO services for the GTCP331-500 APU. This contract has an initial term of four years, with an option for a further two-year extension, and is valued at approximately US$14 million. Together, the contracts reinforce TAT's role as a key service provider for APU maintenance and support for major airline operators. Igal Zamir, Chief Executive Officer of TAT Technologies, said the agreement represents an important milestone for the company's APU business. He noted that the extension of the long-standing relationship for the GTCP331-200/250 platform, combined with the new multi-year contract for the GTCP331-500, highlights both the breadth of the company's technical capabilities and the confidence customers place in its services. Zamir added that TAT continues to expand its market reach while strengthening partnerships with major global operators. The company expects the agreement to support the continued maintenance and operational reliability of the customer's cargo aircraft fleet across both APU platforms.

PAG approved as StableLight autopilot installer

Thales AS350 © PAG

Precision Aviation Services (PAS), a subsidiary of Precision Aviation Group, Inc. (PAG), has been approved as an Authorised Autopilot Installer (AAI) for the Thales and StandardAero StableLight Autopilot System. The next-generation four-axis autopilot is designed specifically for the light rotorcraft market. This new authorisation significantly expands PAG's avionics installation and modernisation capabilities, enabling customers to benefit from StableLight's advanced flight control technology, enhanced safety features and mission-ready performance across a wide range of helicopter operations. StableLight represents a new generation of rotorcraft automation, delivering greater flight stability, reduced pilot workload and improved operational precision for the H125/AS350 in demanding flight environments. As an Authorised Autopilot Installer, PAG is now equipped to support the installation, integration and ongoing service of the StableLight system for qualified rotorcraft platforms. "We are excited to add the Thales and StandardAero StableLight system to PAG's growing portfolio of advanced avionics capabilities," said Jordan Webber, Vice President, Component Services at Precision Aviation Group. "Becoming an Authorised Autopilot Installer allows us to deliver a truly next-level solution to our rotorcraft customers, enhancing safety, performance and mission effectiveness while reinforcing PAG's commitment to innovation."

EFW signs A330 Freighter conversion deal in China

Elbe Flugzeugwerke (EFW), the Airbus–ST Engineering joint venture specialising in passenger-to-freighter (P2F) conversions, has signed a contract with Hong Kong-based aircraft lessor Asia Pacific Aviation Leasing Group (APAL) to convert an Airbus A330-300 passenger aircraft into a freighter. The conversion programme will begin in the second quarter of 2026 at one of EFW's partner conversion facilities. Technical planning and certification activities will be carried out at EFW's headquarters in Dresden, Germany. The agreement strengthens EFW's presence in the rapidly expanding Chinese air cargo market and marks APAL's first freighter conversion project with the company. APAL aims to modernise its fleet and expand its capabilities to meet growing demand for cargo capacity across the region. APAL Chief Executive Officer Hong Wei Zhao said EFW's established expertise in freighter conversions made the partnership an important step in developing efficient cargo solutions for the Chinese market, which the company considers a strategic priority for future investment. EFW Chief Executive Officer Jordi Boto highlighted the role of the Airbus A330P2F platform in the medium-sized freighter segment, noting its strong performance and suitability for airlines and lessors expanding their cargo operations. The new project reflects continued growth in the global air freight sector and increasing demand for converted freighter aircraft as operators seek cost-effective ways to expand cargo capacity.

Image of an A330-300 Freighter © *EFW*

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EirTrade secures approval for Knock facility expansion

EirTrade Aviation looks to quintuple facility at Knock, Ireland West Airport © *EirTrade Aviation*

EirTrade has received full planning permission from Mayo County Council to significantly expand its facility at Ireland West Airport Knock, strengthening its aircraft disassembly and maintenance capabilities. The development will extend the company's existing 2,100 m² site with a new 10,500 m² facility designed to increase capacity for engine and airframe disassembly, as well as EASA Part 145-line maintenance services. Central to the expansion will be a new aircraft hangar capable of accommodating one narrow-body aircraft, with the necessary space and configuration to support airframe disassembly and MRO operations. The expanded site will also include dedicated workshop and crating areas, high-bay very narrow aisle (VNA) racking, bulk storage and specialised engine storage facilities, enabling EirTrade to enhance operational efficiency and logistics capabilities. Steven Trowell, Senior Vice President – Maintenance & Disassembly at EirTrade Aviation, said the project builds on the company's recent relocation of its engine disassembly facility to Knock in November 2025. The new development will allow EirTrade to consolidate a broad range of services at a single location. According to Trowell, the expanded site will enable the company to offer integrated support to customers, combining aircraft maintenance, airframe disassembly and engine teardown services in one facility. In addition, the site will support asset management, parts trading and leasing activities, supported by a dedicated on-site parts inventory. The increased capacity reflects EirTrade's aim to strengthen its ability to support aircraft operators, owners and lessors worldwide. The design of the facility has been developed to meet operational requirements while also addressing airside and runway constraints at Ireland West Airport. Sustainability considerations are also central to the project, with plans for a high-performance building envelope and a large solar panel installation intended to exceed environmental and regulatory standards. Construction is scheduled to begin in late 2026, with the project to be managed by Galway-based multidisciplinary firm O'Neill O'Malley Architecture & Project Management. The development will be carried out in coordination with the Irish Aviation Authority (IAA).

Air Nostrum expands component support deal with Fokker Services

Fokker Services Group (FSG) and Air Nostrum Engineering and Maintenance (ANEM) have signed a new long-term power-by-the-hour (PBH) component support agreement covering Air Nostrum's growing fleet of 30 Mitsubishi CRJ NG aircraft. The agreement builds on the existing support framework and further strengthens the long-standing partnership between the two companies by expanding the scope of services. The nose-to-tail, full-service agreement will be delivered under FSG's established ABACUS Programme and is tailored to Air Nostrum's operational requirements. ABACUS combines component maintenance, inventory support and leasing, guaranteed availability, and 24/7 operational support to enhance fleet reliability while providing predictable, flight-hour-based cost control for day-to-day operations. Fermin Tirado, Managing Director of ANEM, welcomed the signing of the renewed ABACUS agreement with FSG: "We already had a very positive experience working with FSG in the past and feel they are the right regional aircraft service partner supporting our current and future CRK operations. The nature of our business mandates efficiency, flexibility and reliability. Therefore, we see great value in the FSG's ABACUS programme and know that their support will help us to provide the highest level of dispatch reliability to serve our customers." "Our long-standing partnership with Air Nostrum is built on close collaboration and a shared commitment to continuously strengthening the program. With decades of experience in regional aircraft support, we understand the importance of ensuring component availability at the right time, place and configuration, while continuously enhancing reliability and cost control. We look forward to further developing this cooperation and supporting ANEM's ongoing fleet optimisation and business growth." added Dirk Hanenberg, Managing Director of Fokker Services Group.

CRJ NG aircraft © *Fokker Services Group*

WLFC reports strong 2025 results

Willis Lease Finance Corporation (WLFC) announced its financial results for the year ended 31 December 2025. Total revenue reached US$730.2 million in 2025, an increase of 28.3% compared with US$569.2 million in 2024. For 2025, core lease rent and maintenance reserve revenues totalled US$523.6 million, up 15.8% from US$452.1 million in 2024. The growth was largely driven by stronger core leasing and maintenance revenues, reflecting continued strength in the aviation market. Airlines increasingly relied on the company's extensive portfolio of high-demand engines, alongside its parts and maintenance capabilities, to avoid lengthy and costly engine shop visits. "Our 2025 results were strong," said Austin C. Willis, Chief Executive Officer of WLFC. "Equally important, however, were the strategic initiatives and capital markets activities we implemented to support long-term growth." Lease rent revenue increased by US$53.4 million, or 22.4%, to US$291.6 million in 2025 from US$238.2 million in 2024. The increase primarily reflects a larger average portfolio compared with the previous period, as well as higher average utilisation of equipment in the operating lease portfolio. Utilisation is measured based on the net book value of equipment held for operating lease, maintenance rights, notes receivable and investments in sales-type leases, net of allowances. Maintenance reserve revenue rose by US$18.1 million, or 8.4%, to US$232.0 million in 2025 from US$213.9 million in 2024. During 2025, the company recognised US$44.5 million of long-term maintenance revenue, compared with US$39.4 million in 2024. Long-term maintenance revenue is influenced by end-of-lease compensation and the realisation of long-term maintenance reserves associated with engines coming off lease. Engines on lease with non-reimbursable usage fees generated US$187.5 million of short-term maintenance revenues in 2025, compared with US$174.5 million in 2024, an increase of US$13.0 million or 7.4%. The rise in short-term maintenance reserve revenue reflects a higher number of engines on short-term lease conditions, the timing of recognition of in-substance fixed payments, and contractual increases in hourly and cyclical usage rates. Spare parts and equipment sales in 2025 increased by US$68.4 million, or 252.3%, to US$95.5 million, compared with US$27.1 million in 2024. Spare parts sales totalled US$37.7 million in 2025 versus US$26.1 million in 2024, an increase of US$11.6 million or 44.4%. The growth reflects strong demand for surplus material as operators seek to extend the operational life of their current-generation engine fleets. Equipment sales reached US$57.8 million in 2025, relating to the sale of four engines. In 2024, equipment sales totalled US$1.0 million, reflecting the sale of one engine. Gain on the sale of leased equipment was US$54.0 million in 2025, reflecting the sale of 38 engines, five airframes and other parts and equipment from the lease portfolio. In 2024, gains totalled US$45.1 million, reflecting the sale of 35 engines, eight airframes and other parts and equipment. The book value of lease assets owned either directly or through WLFC's joint ventures — including equipment held for operating lease, maintenance rights, notes receivable and investments in sales-type leases — stood at US$3,614.5 million as of 31 December 2025.

SkySelect secures US$9m to transform aviation parts procurement

Estonian-founded SkySelect, an AI-powered procurement platform for aviation parts, has raised US$9 million in new funding. Airlines currently face significant operational and financial challenges linked to parts sourcing. Globally, carriers hold around US$50 billion in excess inventory, much of it tied up in legacy procurement systems that lack real-time visibility. When aircraft are grounded due to missing components — known as aircraft-on-ground (AOG) events — airlines must often rely on manual and fragmented sourcing processes that can take days or even weeks. These disruptions are estimated to cost the industry roughly US$30 billion annually. New procurement technologies are helping airlines and maintenance, repair and overhaul (MRO) organisations streamline operations. By improving access to supplier networks and enabling more efficient logistics planning, these tools can reduce the number of shipments by up to 30%, allowing operators to hold fewer spare parts while lowering both logistics costs and carbon emissions. SkySelect has been at the forefront of applying artificial intelligence to aviation procurement. Rather than relying on general-purpose AI models, the platform uses specialised algorithms designed specifically for aircraft parts sourcing. These systems automatically match part requests with the most suitable suppliers across a global network of thousands of vendors, giving operators real-time visibility into market availability and pricing. The technology supports a just-in-time procurement model, helping airlines maintain operational resilience while reducing the need for costly safety stock. SkySelect also integrates with major enterprise resource planning (ERP) systems, enabling a more seamless end-to-end procurement workflow. Since its launch, the company has processed more than US$6 billion in transactions, including US$1.3 billion in 2025 alone. Its client base continues to expand, with airlines such as JetBlue, Sun Country Airlines, Air Transport Services Group, Widerøe and Vueling among its recent customers. The funding round was co-led by Verb Ventures and RockCreek, with participation from the EU-backed SmartCap Green Fund as well as existing investors Bain Capital Ventures and Lux Capital.


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Bharat Forge and Liebherr open landing gear facility in India

Bharat Forge's aerospace division has launched an innovative landing gear components machining facility in Pune, India, in collaboration with Liebherr-Aerospace. The milestone positions Bharat Forge among the first companies in India—and among the first operating at scale—to run OEM-approved machining capabilities for landing gear components. The facility integrates advanced machining centres dedicated to high-precision landing gear parts and represents a significant step in strengthening India's aerospace manufacturing ecosystem and its role in global aerospace supply chains. Speaking at the inauguration, Mr. Amit Kalyani, Vice Chairman & Joint Managing Director, Bharat Forge stated, "This state-of-the art facility planned in partnership with Liebherr-Aerospace is a very significant milestone in Bharat Forge's journey in the Aerospace sector and a testament to our ability to add value to the customer relationships. We thank Liebherr-Aerospace for the faith reposed in BFL Aerospace division to deliver critical components and products for its global requirements. Today marks more than just an opening; it's a commitment to scaling up our reach and enhancing value addition across our operations. Through strategic partnership, we are building a foundation for Indian manufacturing industry to remain sustainable driving long-term growth." Bharat Forge now offers a full-spectrum aerospace manufacturing portfolio spanning aero-engine components, airframe structures and landing gear sub-systems for both civil and military aviation.

Ribbon-cutting ceremony in Pune with Liebherr Aerospace © *Bharat Forge*

The company produces turbine and compressor components, forged rings, shafts and discs, as well as structural and landing gear elements. It is also establishing an advanced aerospace ring mill in India to manufacture high-value forged rings for aero-engine programmes. Martin Wandel, Managing Director and Chief Operating Officer of Liebherr-Aerospace & Transportation acknowledged the partnership with Bharat Forge, recognising the company as a strong and highly technologically advanced industry leader: "Together we are building a state-of-the-art facility tailored precisely to the requirements of the global aerospace industry. We deeply value this collaboration that marks a significant milestone in advancing innovation and excellence for our customers worldwide."

Airhub Aviation signs strategic MRO agreement with AerCap

Airhub Aviation and AerCap have signed a strategic maintenance agreement © *Airhub Aviation*

Airhub Aviation has signed a strategic maintenance agreement with aircraft lessor AerCap to provide base maintenance and aircraft redelivery services at its facility at Šiauliai International Airport (SQQ) in Lithuania. The agreement establishes Airhub Aviation as a strategic MRO partner for AerCap, supporting narrow-body aircraft transitions, deliveries and redeliveries across Europe and the Middle East. Under the agreement, the company will deliver a range of base maintenance services, including the implementation of EASA-approved modifications. These will cover avionics upgrades, cabin reconfigurations (LOPA modifications), engine swaps, landing gear replacements and the execution of required maintenance programmes for AerCap's airline customers. A dedicated ad hoc maintenance bay will enable rapid aircraft induction, helping minimise downtime for both lessors and operators. Alongside maintenance support, Airhub Aviation will also draw on its capabilities in component management, supply chain solutions and long-term aircraft storage. The company's asset management division provides mid-life aircraft support, including parts harvesting, component repair management and optimised inventory solutions for airlines and leasing companies. The Šiauliai facility offers extensive long-term parking capacity, with space for up to 25 narrow-body aircraft simultaneously, making it one of the largest storage sites in the region. Its location provides cost-effective storage and transition services close to key European markets. As a NATO base airport, Šiauliai International Airport also offers enhanced security infrastructure and 24-hour operational flexibility.

Crestone bolsters aviation platform with Arena acquisition

Crestone Air Partners, the global aviation asset management platform majority owned by Air T, Inc., has entered into a definitive agreement to acquire Arena Aviation Capital (Arena), a well-established aviation asset manager with a diversified portfolio and long-standing airline relationships. The transaction remains subject to customary closing conditions and regulatory approvals. The acquisition significantly strengthens Crestone's aviation lifecycle platform by expanding both its scale and operational capabilities. Once completed, the combined business is expected to manage a portfolio of approximately 124 aircraft and 17 engines leased to airlines worldwide. Assets under management are projected to exceed US$4 billion, supported by a team of more than 55 employees operating across five countries. Arena brings a highly experienced team, a complementary portfolio and deep technical expertise that closely aligns with Crestone's lifecycle-focused investment strategy.

Crestone Air Partners has entered into a definitive agreement to acquire Arena Aviation Capital © *Shutterstock*

The integration of the two organisations is intended to enhance service capability across the full aircraft ownership cycle, from acquisition and leasing to asset management and remarketing. Following completion of the transaction, the combined platform will maintain key offices in Denver, Amsterdam and Dublin, alongside satellite presences in Singapore and Buenos Aires. This global footprint is expected to strengthen relationships with airline customers and capital partners while supporting aircraft owners across multiple regions. Members of Arena's management team are expected to take on key roles within the combined organisation. Crestone anticipates a smooth integration, focused on continuity for airline customers, capital partners and employees, while leveraging operational synergies across asset management, technical services, lease administration and market intelligence.

AJW Group renews partnership with ASL Aviation to support A330ceo fleet

Airbus A330ceo aircraft operated for Saudi Airlines Cargo by ASL Airlines © *AJW Group*

AJW Group (AJW) has signed a new support agreement with ASL Aviation Holdings (ASL) to provide airframe-only support for two A330ceo aircraft operated by ASL Airlines Ireland. Reigniting a partnership that began with AJW supporting twelve of ASL's B737CL aircraft, the new agreement will see AJW deliver technical and engineering support on a time and materials (T&M) basis. This approach enables ASL to maintain operational flexibility while ensuring reliable and responsive aircraft support for its commercial operations. The programme went live earlier this year, with AJW providing operational support for the aircraft over an initial four-year period, reinforcing its long-term commitment to supporting ASL's operators. This partnership reflects AJW's continued growth and its ability to deliver tailored support solutions for widebody aircraft fleets. By focusing on airframe expertise and flexible commercial terms, AJW will help ensure the ongoing safety, reliability and performance of ASL's A330ceo operations.

Ramco Aviation Software selected by Sahar Group to power next phase of growth

Contract signing between Sahar Group and Ramco Systems Corporation © *RSC*

Ramco Systems Corporation, USA (RSC), a subsidiary of Ramco Systems Limited, has announced that Sahar Group, an aerospace services provider specialising in the UH-60 Black Hawk platform, has selected Ramco's next-generation aviation software to support its ongoing growth initiatives. As part of Sahar Group's plan to scale its commercial operations and expand into new aviation segments such as Parts Manufacturer Approval (PMA), Supplemental Type Certificates (STC), and helicopter sales and leasing, the organisation is investing in a modern, unified digital platform to manage increasing operational complexity. Ramco Aviation Software will serve as the core system foundation supporting this strategy, enabling greater visibility, control and coordination across key business functions. With integrated capabilities covering maintenance planning, component maintenance, supply chain, MRO and part sales, quality and compliance, and finance, Ramco Aviation Software will provide Sahar Group with end-to-end lifecycle coverage across its operations. This will help streamline processes, improve data accuracy and support faster decision-making, ultimately enhancing service levels and the customer experience. In addition, Ramco's digital tools — including 'Ramco Anywhere' mobile applications for mechanics and warehouse staff, real-time dashboards, HUBs and e-Signoff — will support Sahar Group's efforts to improve operational efficiency and productivity while advancing towards paperless, digital-first operations.

StandardAero and AviLease establish engine MRO partnership

StandardAero has signed a general terms agreement (GTA) with global aircraft lessor AviLease. The agreement enables StandardAero to provide AviLease with MRO services for the CFM International LEAP-1A, LEAP-1B and CFM International CFM56-7B engines in support of its global leasing activities. Headquartered in Saudi Arabia and backed by the long-term capital of its visionary shareholder, the Public Investment Fund (PIF), AviLease aims to become a top-ten global aircraft leasing company. Acting as a dynamic capital allocator, AviLease owns and manages a portfolio of 200 predominantly new-technology, fuel-efficient aircraft on long-term lease to 53 airline customers. With a seasoned global team of 95 professionals across five offices, AviLease serves as a national champion in aircraft leasing and plays a key role in Saudi Arabia's Vision 2030 and National Aviation Strategy. Commenting on the agreement for StandardAero, Olivier Ruffet, Vice President Sales – EMEA, said: "StandardAero is delighted to establish a relationship with AviLease through this new agreement, which will enable our teams of LEAP and CFM56 engine MRO experts to provide responsive support to AviLease and its airline customers. We look forward to delivering high-quality engine services as AviLease continues its dynamic growth journey in the years ahead." StandardAero provides support for the next-generation CFM International LEAP-1A and LEAP-1B engine family from its 810,000 ft² facility in San Antonio, Texas. In March 2023, the company signed the first non-airline CFM-branded service agreement (CBSA) in the Americas covering both the LEAP-1A and LEAP-1B.

Astronics selected by Boeing for 737 MAX fuel tank access doors

Astronics Corporation has been selected by Boeing to supply fuel tank access doors for the Boeing 737 MAX aircraft programme. Nick Stevenson, President of Astronics PECO, commented: "We have a long-standing and valued partnership with Boeing, and we are pleased to support the 737 MAX programme with the addition of fuel tank access doors to our current offerings." The doors will be manufactured in Clackamas, Oregon, where Astronics designs and produces a wide range of advanced technical products, from aircraft passenger service units to environmental control systems. The facility's capabilities include comprehensive multi-disciplinary design engineering and product qualification, alongside highly vertically integrated manufacturing operations. These include custom injection moulding, die casting, CNC machining, NADCAP-accredited bonding, chemical and finishing processes, as well as integrated assembly and testing.

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IFS completes Softeon acquisition to launch new AI-driven supply chain platform

IFS has completed its acquisition of Softeon, giving enterprises across manufacturing, logistics and retail access to a new category of supply chain technology. Operating as IFS Softeon, the move combines IFS' powerful Industrial AI capabilities with Softeon's more than 20 years of tier-1 warehouse management software (WMS) expertise. The launch of IFS Softeon marks a significant moment in the supply chain technology landscape, addressing a long-standing challenge: many enterprises operate disconnected Enterprise Resource Planning (ERP) and WMS systems, creating costly blind spots. IFS Softeon aims to resolve this by delivering unified visibility from the boardroom to the warehouse floor, powered by Industrial AI. The platform brings together deep industrial domain expertise, robotics orchestration and proven warehouse execution within a single, integrated offering. IFS Softeon responds to growing demand for intelligent, fully integrated supply chain solutions. IFS already manages US$2.4 trillion in critical assets and

IFS has completed the acquisition of Softeon to launch a new AI-driven supply chain platform © *Shutterstock*

brings its industry-leading IFS Cloud platform—purpose-built for asset-intensive industries—alongside embedded Industrial AI capabilities and robotics orchestration expertise. Softeon contributes a field-proven WMS platform, recognition as a Gartner Visionary*, and extensive operational experience managing warehouse operations for a blue-chip customer base including Brooks, Casey's, Denso, Sears Home Services, Sony and UPS. Together, IFS Softeon now processes millions of orders each month and supports warehouse operations in 30 countries. Mark Moffat, CEO of IFS, commented: "The introduction of IFS Softeon means that every enterprise grappling with the complexity of modern supply chains now has access to something genuinely new: end-to-end supply chain intelligence, from strategic decision-making to physical execution on the warehouse floor. Industrial AI meets limitless warehouse execution — a combination that will transform what is possible for our customers."

Veryon expands partnership with Airbus Helicopters

© *Airbus Helicopters*

Veryon has disclosed the expansion of its longstanding partnership with Airbus Helicopters through the signing of a renewed Master Supply Agreement, together with a support and sales agreement with Airbus Helicopters. These renewed agreements expand the collaboration and extend the use of Veryon Tracking+ and other products across Airbus Helicopters' global customer support network. As Veryon's product portfolio continues to grow, both organisations are working to consolidate multiple systems into a single source of truth, simplifying data access and decision-making. The broader partnership also enables Airbus Helicopters to provide innovative digital tools to operators of all sizes, enhancing connectivity, maintenance efficiency and aircraft availability worldwide. "This expanded partnership marks an exciting milestone in our relationship with Airbus Helicopters, providing our OEM customers with tools to unify data from multiple sources and deliver operators the insights they need to maximize aircraft availability," said Bethany Little, Chief Executive Officer of Veryon. "It not only strengthens our technical and operational alignment but ensures Airbus Helicopters customers continue to benefit from best-in-class digital maintenance and data management solutions."

The expanded partnership introduces enhanced CAMO services through the authorised use of Veryon Tracking+ by Airbus Helicopters for a growing number of aircraft, supporting increasing global demand. It also establishes a shared delegation model that enables operators to develop their own expertise and move towards greater self-reliance while retaining access to the tools required to ensure airworthiness. In addition, operators will gain access to innovative digital solutions developed by Veryon and validated by Airbus Helicopters, providing trusted technology within a unified ecosystem.

Setna iO widens teardown portfolio with B737-700 and CFM56-7B acquisitions

Setna iO has acquired one Boeing 737-700 airframe and two CFM engines *© Setna iO*

Setna iO is widening its teardown portfolio with the acquisition of one Boeing 737-700 airframe, previously operated by Southwest Airlines, alongside two CFM56-7B26 engines formerly in service with Georgian Airlines, further strengthening its integrated aftermarket strategy. The B737-700 will be disassembled for piece parts at the ecube facility in Coolidge, Arizona, supporting demand across Setna iO's global customer base.

In line with the company's vertically integrated operating model, harvested components will be routed through its in-house MRO network — Setnix Arizona, Setnix UK, Landing Gears Technologies (LGT) and Zulu Global — for repair and overhaul prior to redistribution via Setna iO's global sales channels. The two CFM56-7B26 engines will be dismantled at the Willis Engine Repair Centre in Bridgend, UK. The teardown will add further depth to Setna iO's growing inventory of high-demand CFM56 material, including modules and serviceable components, aimed at supporting operators worldwide. These acquisitions reinforce Setna iO's strategy of combining asset purchasing, in-house technical capability and a broad international sales presence to deliver responsive, end-to-end aftermarket solutions to the aviation industry.

SR Technics wins CFM56-7B MRO contract in North America

SR Technics employees work on CFM56 engines *© SR Technics*

SR Technics has signed a new multi-year agreement with a major North American airline for CFM56-7B heavy shop visit maintenance. Drawing on more than 90 years of aviation heritage, Swiss quality standards and its core principles of trust, accountability and teamwork (TAT), the agreement reflects the confidence placed in SR Technics by a leading operator. It further strengthens the company's footprint in the North American market and reinforces its established expertise across CFM engine platforms. The contract underscores sustained customer trust in SR Technics' operational performance and technical capability in delivering complex engine shop visit programmes. The CFM56-7B remains one of the most widely operated narrow-body engines globally, making reliable, high-quality MRO support critical for airline fleet performance and cost control. The agreement consolidates SR Technics' role as a trusted partner for airlines seeking reliable, performance-driven engine maintenance support in a competitive and capacity-constrained market.

Thomas Global Systems expands Irvine facility as it marks 70 years

Ribbon cutting ceremony at Thomas Global Systems in Ivine, California © *Thomas Global Systems*

Thomas Global Systems has marked the opening of its expanded engineering and advanced manufacturing facility in Irvine, California, coinciding with the company's 70th anniversary. The milestone reflects Thomas Global Systems' ongoing investment in engineering capability, programme delivery and long-term support for aerospace and defence customers. The Irvine expansion increases the company's U.S. engineering, manufacturing and programme support capacity, strengthening its ability to deliver innovative, high-integrity electronic solutions for commercial aviation, defence and government applications. "This expansion represents a deliberate investment in our people, our capabilities and the customers we support," said Angus Hutchinson, CEO of Thomas Global Systems. "As we mark 70 years of operations, our focus remains on practical innovation, engineering excellence and delivering long-term value across the aerospace and defence sector." Founded in Sydney, Australia, in 1956, Thomas Global Systems has grown from a specialist electronics manufacturer into an international aviation and defence electronics business. Operating from modern facilities in Irvine, California, and Sydney, Australia, the company delivers innovative, dependable and customer-focused solutions across commercial aviation, defence and government markets.

Rolls-Royce delivers strong financial momentum in 2025

Rolls-Royce has reported another year of robust strategic and financial progress in 2025, with marked improvement across all key financial indicators. Over the past three years, its transformation programme has delivered a step-change in performance, generating higher operating profit and free cash flow while capital expenditure has doubled. The group continues its evolution into a high-performing, competitive, resilient and growth-oriented business. This stronger financial delivery has been achieved despite a challenging external environment, including ongoing supply chain constraints, which are being actively managed. Underlying operating profit rose to £3.5 billion in 2025, up from £2.5 billion in 2024, with the operating margin increasing to 17.3% from 13.8%. Civil Aerospace recorded an underlying operating margin of 20.5%, compared with 16.6% the previous year, driven by improved performance in the large engine aftermarket, contractual margin enhancements and stronger profitability in spare engines. Defence achieved an underlying operating margin of 14.4%, slightly ahead of 14.2% in 2024, reflecting improved results across transport and combat programmes and the absence of a prior-year one-off benefit in submarines. Power Systems delivered an operating margin of 17.4%, up from 13.1%, supported by growth in power generation, particularly in data centres and government-related demand. Group-wide profitability gains were reinforced by continued efficiency and simplification measures. Free cash flow increased to £3.3 billion from £2.4 billion in 2024, supported by higher operating profit, sustained growth in long-term service agreement balances and strong working capital performance, partially offset by net investment. Net cash stood at £1.9 billion at year-end, compared with £475 million a year earlier. Gross debt fell to £2.8 billion following bond repayment, while liquidity remained strong at £8.7 billion. The Group's cost discipline and operational efficiency have strengthened resilience and reduced volatility in free cash flow. (£1.00 = US$1.35 at time of publication).

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LIMCO and PIEDMONT now operate as TAT Technologies — a global leader in certified aerospace MRO.

DAE to acquire Macquarie AirFinance in US$7bn deal

© Dubai Aerospace Enterprise (DAE)

Dubai Aerospace Enterprise (DAE) has entered into a definitive agreement to acquire 100% of Macquarie AirFinance (MAF) for an approximate enterprise value of US$7 billion. The combined group will have a pro forma fleet of 1,029 owned, managed and committed aircraft and will serve 191 airline customers across 79 countries. Narrow-body aircraft will account for approximately 70% of the enlarged fleet. Upon completion, DAE is expected to add 37 airline customers to its portfolio, including operators in seven new country markets. The transaction will be prudently financed through a combination of debt and equity, supporting DAE's current investment-grade credit ratings and its objective of achieving an upgrade following the doubling of the franchise over the past 18 months.

Commenting on the transaction, Khalifa AlDaboos, Managing Director of DAE, said: "This transaction demonstrates the shareholder's long-standing commitment to positioning DAE among the world's leading aircraft leasing companies. It continues DAE's strategy of acquiring established platforms and fleets that enhance the franchise and deliver exceptional shareholder value." The transaction has been approved by DAE's Board of Directors and is subject to customary closing conditions, including receipt of certain regulatory approvals. It is expected to complete in the second half of 2026.

Collins Aerospace commits US$40 Million to Puerto Rico expansion

Collins Aerospace has announced two expansions in Puerto Rico © RTX

RTX's Collins Aerospace has disclosed the investment of more than US$40 million to support two operational expansions and to modernise infrastructure, machinery and equipment at its facilities in Santa Isabel and Aguadilla, Puerto Rico, announced by Governor Jenniffer González Colón. The initiative is expected to create around 525 highly skilled, full-time engineering and manufacturing roles, increasing Collins' workforce in Puerto Rico to almost 2,100 employees and bringing RTX's total headcount on the island to approximately 3,500. The event took place in San Juan at La Fortaleza, the governor's official residence, and was attended by the Secretary of the Department of Economic Development and Commerce, Sebastián Negrón Reichard, the Executive Director of the Puerto Rico Industrial Development Company, Roberto Lefranc Fortuño, along with senior Collins executives.

"Puerto Rico is a strategic hub for Collins' continued sustainable growth," noted Javier Ramis Rivero, Vice President of Global Operations at Collins. "Our planned expansion will create a shared infrastructure focused on end-to-end electronics operations, from design to manufacturing, enhancing support and on time delivery for our customers. This will allow us to optimize productivity and automation, providing scalable automation solutions, connected factories and hands-on learning areas." Collins has operated in Puerto Rico for more than 30 years, supporting the full product life cycle — from design and manufacturing through to maintenance, repair and overhaul — for integrated systems and components serving the aerospace and defence sectors. Its Santa Isabel site produces electronic and electromechanical components, while the Aguadilla facility delivers engineering services across the Collins organisation. "Puerto Rico's economic development is built on attracting and retaining high-value-added industries that create well-paying jobs." remarked Governor Colón. "This expansion demonstrates the aerospace sector's confidence in our talent, our infrastructure, and in public policy aligned with sustained growth." Collins' activities in Puerto Rico span a broad portfolio of processes and products, including digital and control systems such as switches, system controllers and moving map displays; electrical systems incorporating high-power, motor and signal-level controllers; and communications systems encompassing radar equipment, radio-frequency technologies and high-frequency transmitters.

Erickson Group acquires 321 Precision Conversions

321 Precision Conversions, a provider of Airbus A321-200PCF freighter conversions, has announced that Erickson Group (Erickson), a global and diversified aviation and aerospace business, has acquired full ownership of the company through its wholly owned subsidiary, Precision Aircraft Solutions. Under the terms of the transaction, Erickson has increased its existing majority holding in 321 Precision Conversions by acquiring the minority stake previously owned by Air Transport Services Group (ATSG). That interest had been held through ATSG's subsidiary, Cargo Aircraft Management, Inc. The acquisition consolidates Erickson's position within the narrowbody freighter conversion market and provides 321 Precision Conversions with the strategic backing of a larger, vertically integrated aerospace group. With full ownership now secured, Erickson is expected to align the company more closely with Precision Aircraft Solutions' engineering, certification and programme management capabilities, supporting continued development of the A321-200PCF platform and enhancing its competitiveness in the global cargo aircraft sector. "This is an important strategic milestone for the future of 321 Precision Conversions as it strengthens our commitment to delivering advanced freighter conversion solutions to global cargo operators," commented Gary Warner, President of 321 Precision Conversions. "Full ownership under Erickson enables us to invest more boldly in our people, our partners, and the next generation of conversion programs. We thank ATSG for their support and collaboration over the years and will continue to support them as a customer."

Erickson Group acquires 321 Precision Conversions © *Shutterstock*

J&C Aero sells majority stake to Setna iO

Setna iO has taken a majority stake in J&C Aero © *J&C*

J&C Aero (J&C), a European cabin interior hub, has announced the sale of a majority stake in the business to Setna iO (SETNA), a Chicago-based global aviation group specialising in used serviceable material, trading, repair services and asset leasing. The transaction is intended to support J&C's next phase of growth while maintaining its operational standards, leadership continuity and long-term strategy. Through the partnership, J&C aims to expand beyond its core European markets, broaden its service capabilities and strengthen its international presence. For SETNA, the acquisition diversifies its portfolio and enhances its industrial platform through investment in a high-value aerospace business with established OEM and aftermarket positioning and recurring lifecycle revenues. Under the new ownership structure, J&C's five founders will retain significant shareholdings and continue to manage day-to-day operations, ensuring strategic consistency and founder-led leadership. According to Chief Executive Officer Laurynas Skukauskas, the decision centred on long-term alignment and cultural fit, with both organisations sharing a focus on expertise, teamwork and strong customer commitment. J&C Aero holds multiple regulatory approvals, including EASA Part 21J (design), Part 21G (production), Part 145 (maintenance) and Part CAMO. The company operates more than 9,000 m^2 of facilities and employs 240 specialists. For SETNA, the acquisition represents a strategic expansion into certified aerospace design, production and maintenance capabilities in Europe, further strengthening its lifecycle service offering.

AerFin boosts wide-body investment with A330 acquisition

AerFin has completed the acquisition of a CF6-80-powered Airbus A330, adding further momentum to its wide-body investment activity and reinforcing its position as a leading player in the global aviation aftermarket. The transaction closed at the end of 2025 and reflects AerFin's continued confidence in wide-body platforms with strong global operator and aftermarket demand. CF6-80-powered assets remain a key part of AerFin's wide-body strategy, valued for its longevity, versatility and broad customer base. Over the past 15 years, AerFin has built a strong track record in sourcing, managing and deploying aviation assets at scale. Recent activity has taken the total number of airframes and engines acquired since the company's founding to 449, underlining its long-established and disciplined investment approach.

"This acquisition is a strong example of how we continue to deploy capital with discipline. We know these assets well, we understand where the demand sits, and we are able to move decisively when the right opportunity presents itself. That approach has underpinned our growth for 15 years and continues to guide how we invest today," commented AerFin CEO Simon Goodson.

West Star Aviation unveils major Chattanooga expansion

Mike Ditmeyer, Vice President and General Manager, Chattanooga Location *© West Star Aviation*

West Star Aviation has announced a significant expansion at its Chattanooga Airport campus. The project responds to increasing customer maintenance demand and is supported by the skilled teams who return aircraft to service each day. Upon completion, targeted for February 2027, the Chattanooga site will extend to approximately 400,000 ft².The development enhances capacity and capability across two principal areas of the campus. Hangar 26 will comprise 40,000 ft² of hangar space, supported by 15,000 ft² of shop and office facilities. These will include customer offices, programme offices and climate-controlled storage to protect customer interiors and property when removed from aircraft. The expansion also incorporates an overhead crane, fall-protection systems, dedicated fire-rated aircraft document storage rooms and an upgraded customer lounge — improvements designed to strengthen safety, operational efficiency and the overall customer experience. In addition, the project will extend the existing Hangar 27 with a new two-storey, 30,000 ft² addition. The expanded footprint will accommodate a larger Aircraft Service Department, Accessories Shop, Composites Shop and Sheet Metal Shop, bringing critical functions into closer proximity to improve workflow, communication and turnaround times."This is a very exciting time for West Star Aviation as we continue to grow here at Chattanooga Airport," said Mike Ditmeyer, Vice President and General Manager, Chattanooga Location. "The site expansion strengthens our foundation to support our customers' maintenance needs and further develop our team's expertise. The pride, quality, and teamwork of this group are at the heart of this facility." The expansion is expected to create up to 200 additional skilled roles over the next five years, reinforcing West Star Aviation's commitment to Tennessee's workforce and the regional economy. The Chattanooga facility currently employs more than 500 team members supporting aircraft operators daily, reflecting the company's sustained growth and long-term investment in the region. Chattanooga remains a strategic location for West Star and for customers requiring reliable maintenance support. With convenient access across the Southeast, the East Coast and the North Central United States, the airport's accessibility — combined with the region's connectivity and amenities — provides a strong foundation for long-term service growth. As one of West Star Aviation's full-service locations, Chattanooga enables customers to complete all required work in one place. From scheduled maintenance to major modifications, including avionics upgrades, interior refurbishment and paint, the team can coordinate the full scope of activity under one roof, simplifying scheduling and minimising downtime.

Merit AirFinance commits US$1.3bn in financing since launch

Merit AirFinance, an aviation lending company focused on providing customised debt capital solutions to airlines and aircraft leasing companies, has closed or committed approximately US$1.3 billion in financing across 11 transactions since launching operations in August 2025. The company's early activity reflects strong demand in the aviation sector for flexible and tailored financing structures. Of the 11 transactions completed or committed to date, six have been with aircraft leasing companies and five with airlines, illustrating Merit's strategy of supporting both key segments of the aviation market. Among the recent deals is the company's largest transaction so far, representing more than US$350 million in total notional value. The financing was completed with one of the world's largest aviation leasing companies and marks the second transaction between the two parties since Merit began operations. The deal highlights the company's approach of building long-term partnerships while structuring financing solutions designed to meet the specific needs of its counterparties. Patrick Mahoney, President of Merit AirFinance, said the company's focus since launch has been on efficient execution and delivering customised financing structures that align with the operational and financial objectives of airlines and leasing companies. He added that Merit's success is closely linked to the success of its partners, and that the firm places strong emphasis on understanding its counterparties' goals and operational challenges in order to build long-lasting, mutually beneficial relationships. To support its continued growth and expanding pipeline of transactions, Merit has also been strengthening its team with professionals bringing a range of aviation industry expertise. This includes the appointment of Brian Devenney as Head of Origination. Prior to joining Merit, Devenney served as Senior Vice President at Perseus Aviation and Merx Aviation.

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- Bachelor's degree in Mechanical, Aerospace or related Engineering field and five years of post-degree work experience in aerospace mechanical engineering.

- Work experience required with:

  - Conducting static ultimate strength analysis
  - Fatigue and damage tolerance analysis of structural repairs and alterations on both metallic and composite aircraft structure.
  - Designing structural repairs, alterations, and deviations on aircraft structure compliant with regulatory requirements and commercial aircraft industry standards.
  - Drafting repairs or alterations with CAD software
  - Using crack growth software (NASGRO or AFGROW) to perform DTA.
  - Attaining regulatory approvals for repairs or alterations on commercial aircraft structure from the FAA and other foreign regulators, such as the EASA.

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Talking to Demetrios Bradshaw, CEO and Maurizio Pozzi, President of Aeras Aviation

AviTrader MRO 360°: Can you tell us a bit about the history of Aeras Aviation?

Aeras Aviation was founded in October 2017 in Dubai with a bold and focused ambition: to become a trusted global partner in aviation asset management and aftermarket solutions. From day one, we recognized that turbine availability, cost volatility, quality, and regulatory complexity were placing increasing pressure on airlines and lessors. We positioned ourselves not simply as a trader of assets, but as a strategic partner of choice.


Demetrios Bradshaw, CEO of Aeras Aviation

Over the past eight years, Aeras has evolved into a multi-country-based aviation asset management partner with global reach. Our growth has been disciplined and opportunity-driven, built on technical depth, strong partnerships, and prudent capital deployment. Today, as we expand into aircraft leasing, we are extending our lifecycle expertise beyond engines—strengthening our position as a comprehensive aviation asset partner.

What are the key products and services Aeras Aviation provides?

At our core, we specialize in end-of-life engine acquisitions, strategic teardowns, and the supply of high-quality serviceable and overhauled material. We also design and manage structured engine programs for airlines and MROs seeking predictability, liquidity, and operational resilience.

Our technical expertise spans major engine platforms from leading OEMs, including:

- CFM International
- GE Aerospace
- Rolls-Royce
- Pratt & Whitney
- International Aero Engines

These platforms power the majority of the global commercial fleet. Our role is to unlock value across the asset lifecycle—whether through teardown optimization, material redistribution, or engine and asset remarketing / leasing. We operate at the intersection of technical precision and financial strategy.


Maurizio Pozzi, President of Aeras Aviation

How do you define Aeras Aviation's core mission today, and how has that mission evolved since the company's founding?

Our mission is clear: to maximize aviation asset value while enhancing operational sustainability for our partners.

In our early years, our focus was primarily transactional in terms of buying, trading, and redistributing engine assets efficiently. As the market matured and volatility increased, our mission expanded. Today, we act as long-term strategic partners, offering lifecycle management solutions that integrate commercial intelligence, technical analytics, and financial structuring.

The post-pandemic environment has reinforced the importance of resilience, liquidity, and flexibility. Our evolution reflects this reality. We are no longer simply participating in the aftermarket—we are shaping asset strategies that allow airlines and lessors to navigate complexity with confidence.

What should airlines consider in order to reduce their engine maintenance costs?

Engine maintenance is no longer just a technical matter—it is a capital allocation strategy. Airlines must adopt a lifecycle mindset. This includes proactive shop visit planning, intelligent LLP management, and optimizing time-on-wing through data-driven maintenance strategies.

Equally important is the strategic use of certified serviceable material (USM). In today's constrained supply environment, access to high-quality USM can significantly reduce overhaul costs while maintaining reliability and compliance. Airlines should also consider structured engine programs, short-term leasing solutions, and pooling arrangements to mitigate AOG exposure and protect revenue streams.

Ultimately, reducing engine maintenance cost is about integrating operational insight with financial discipline. Those who treat engines as managed financial assets—not just mechanical components—will be ahead of the curve.

How do you assess the current state of the aviation leasing and asset management market, particularly in the post-pandemic environment?

We are operating in a structurally tight market. Demand has surpassed pre-pandemic levels, yet OEM production constraints and supply chain limitations continue to restrict new aircraft and engine deliveries. This imbalance has created sustained upward pressure on lease rates, asset values, and material demand. It is clearly a lessor-favourable market. However, it is also a market that demands discipline and value. Elevated values can mask underlying technical and maintenance risks if not managed correctly.

In this environment, technical due diligence, asset lifecycle forecasting, and disciplined capital deployment are more important than ever. Companies that combine technical expertise with financial prudence will capture long-term value—not just short-term gains.

Which internal capabilities—commercial, technical, or financial—do you consider most critical to sustaining competitiveness?

Commercial acumen, technical expertise, and financial discipline form the foundation of our competitiveness. However, it is the synchronization of these three pillars that truly differentiates a company in today's market.

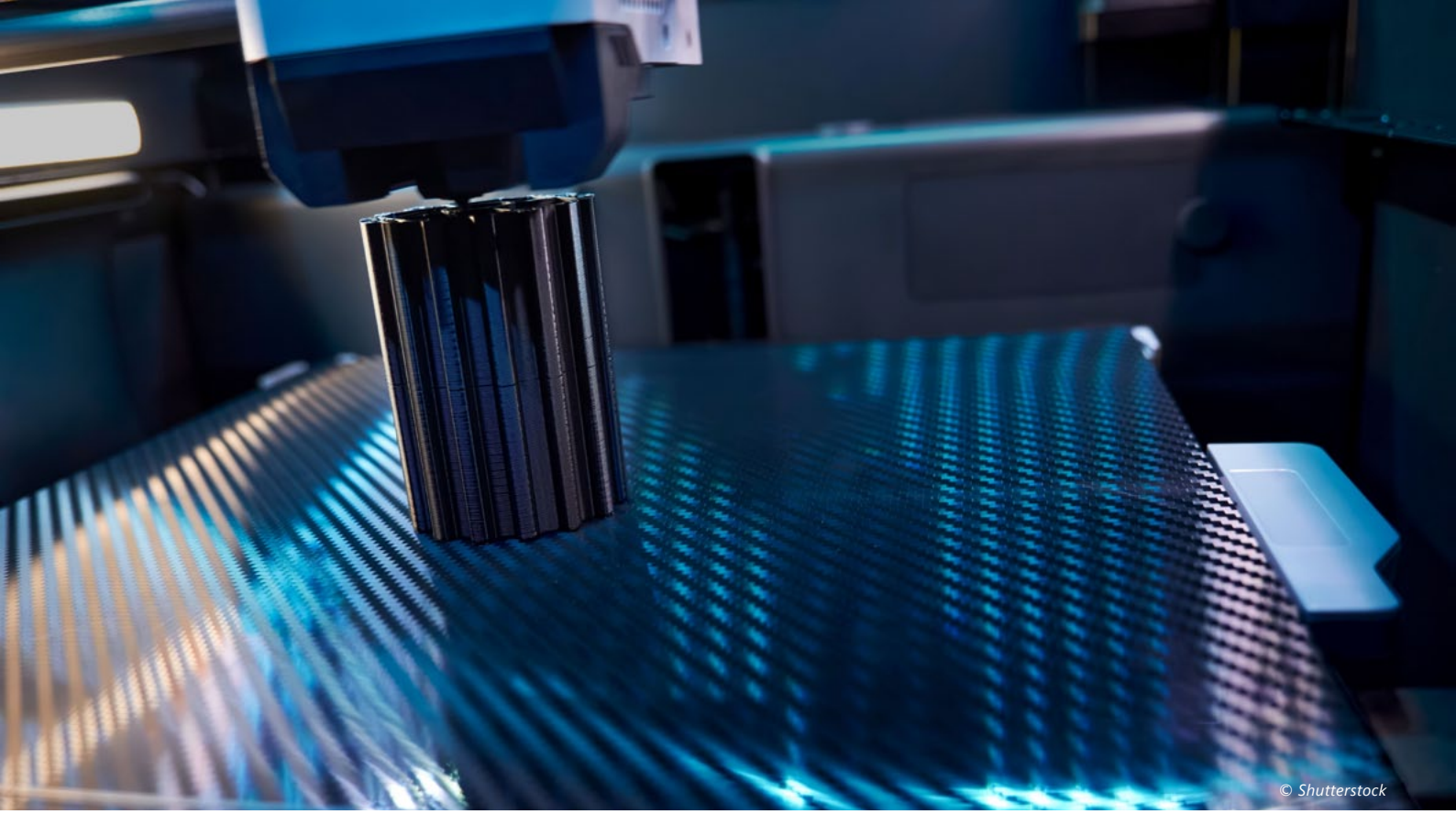
Commercial Capability ensures we structure transactions creatively and responsively. Technical Expertise allows us to accurately evaluate assets, manage teardowns, and protect quality standards. Financial Discipline ensures sustainable growth, risk control, and optimal capital allocation.

Beyond these fundamentals, several additional factors are critical:

- Agility in responding to market shifts
- Deep customer relationships built on trust
- Strong governance and compliance frameworks
- A culture of accountability and performance
- A commitment to teamwork and cross-functional collaboration

Sustained competitiveness is ultimately built on consistently delivering value while maintaining operational flexibility and financial discipline.

> "In today's aviation market, resilience is built on foresight. At Aeras Aviation, we don't just trade assets—we design lifecycle strategies that unlock value, ensure stability, and keep global fleets flying longer and more sustainably. Our ambition is clear: to lead with discipline, innovate with purpose, and build partnerships that create lasting value for the industry."



Additive Manufacturing (3-D Printing) of Aircraft Spare Parts

How an original idea for rapid prototyping is now having a positive influence on the aerospace industry

By David Dundas

A brief history of additive manufacturing

As one element of the digital age, 3-D printing, or rapid prototyping as it was originally known, is a relatively 'new' addition with its origins dating back to the 1980s. In fact, it was in 1981 in Japan that Dr Hideo Kodama invented the very first rapid prototyping machine which involved the creating of parts using a layering process with the resin being polymerised using UV light. Five years later in 1986, Chuck Hull filed the first patent for stereolithography (SLA) and it is he who became known as the 'father of printing' through his creation and commercialisation of both SLA and, as important, the .stl format.

In 1988, Carl Deckard, who at the time was a student at the University of Texas, licensed selective laser sintering (SLS) technology, which was an additional form of 3-D printing that used a laser to sinter (fuse together using heat but without melting the materials) powdered material into solid structures. The following year, Scott Crump patented fused deposition modelling (FDM) – a.k.a. fused filament fabrication (FFF) – and founded Stratasys, one of the main players in the 3-D printing industry. However, it wasn't until 2006 that the first commercially available 3-D printer hit the market.

Thanks to the RepRap Project, founded by Dr Adrian Bower, 2005 proved to be a very important year in the history of 3-D printing. The RepRap Project was an open-source initiative and, according to UltiMaker, the initial goal of the project was to re-think additive manufacturing, starting with FDM/FFF, as a low-cost technology capable of self-replication. The result was a 3-D printer called the RepRap, which became an inspiration for virtually every successful low-cost 3-D printer from that point on. The RepRap 3-D printer comprised many plastic parts that could be printed by the RepRap itself, meaning that it was "self-replicating".

Jumping forward to today, and not only do they have a low-gravity 3-D printer on the International Space Station to print tools on an as-and-when-needed basis, but you also have companies such as Gerhard Schubert who have created a 'digital warehouse' of parts and tools that can be printed to order both for customers and other organisations. Now you will find frequent examples of 3-D printed elements and parts in the automotive, construction, healthcare, manufacturing and, of course, aerospace industries.

The Influence of Additive Manufacturing on the Aerospace Sector

In fact, additive manufacturing (3-D printing) is increasingly reshaping the aerospace industry. While the technology was initially used for rapid prototyping, it has evolved into a powerful production method capable of manufacturing certified aircraft components. In the context of aircraft maintenance, repair, and overhaul (MRO), additive manufacturing now offers new possibilities for producing spare parts more efficiently, both reducing supply chain

complexity and enabling innovative design solutions.

As airlines operate increasingly complex aircraft and global fleets continue to age, when combined with supply chain problems, the need for reliable spare parts has never been greater. Traditional manufacturing methods often require long lead times and large inventories of rarely used components. Additive manufacturing addresses many of these challenges by enabling on-demand production of parts directly from digital models, making it a compelling solution for modern maintenance operations.

Understanding Additive Manufacturing in Aviation

Additive manufacturing differs fundamentally from conventional manufacturing techniques as traditional production methods typically involve subtractive processes such as machining, where material is removed from a solid block. In contrast, additive manufacturing builds components layer by layer, depositing or fusing material according to a digital design file.

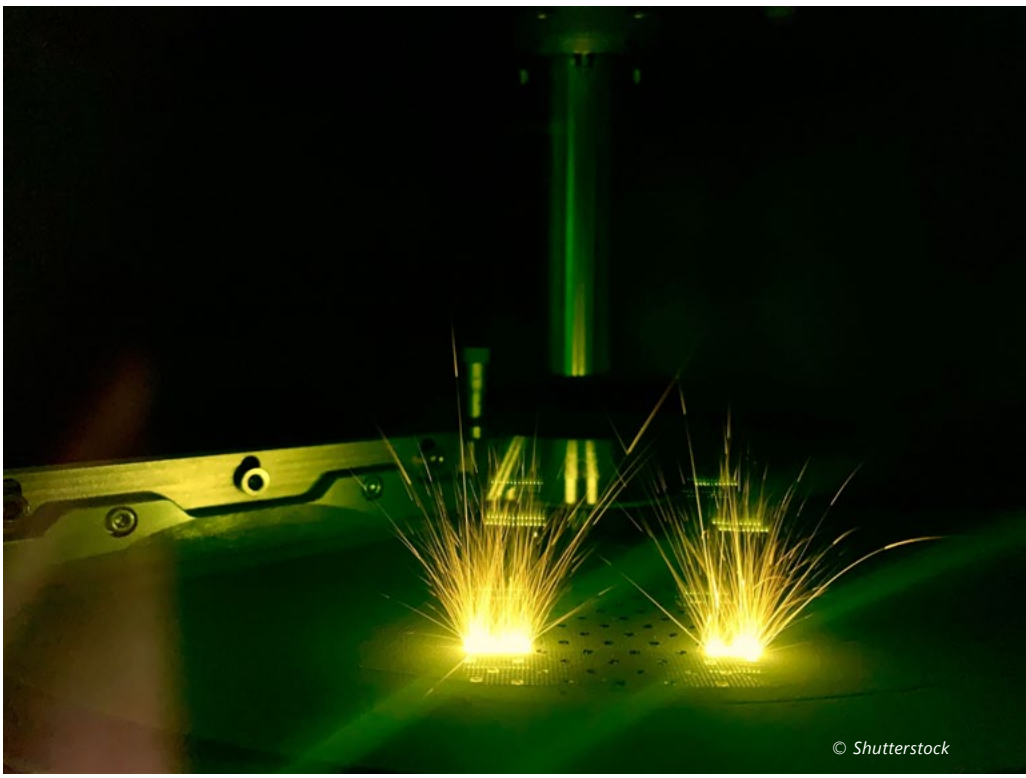
Several additive manufacturing processes are widely used in aerospace applications. One of the most common is Powder Bed Fusion (PBF), which includes technologies such as Selective Laser Melting (SLM) and Electron Beam Melting (EBM). In these systems, a high-energy laser or electron beam melts layers of metallic powder—often titanium, aluminium, or nickel alloys—to form strong and precise components.

Another important method is Directed Energy Deposition (DED). This technique feeds metal powder or wire into a focused energy source that melts the material as it is deposited. DED is particularly valuable for repairing worn components or adding material to existing parts.

A third approach, Binder Jetting, uses a liquid binding agent to join layers of powdered material before the part is sintered in a furnace. The advantages of binder jetting is that it offers high production speed and is increasingly considered for manufacturing non-critical aircraft components.

Advantages for Aircraft Spare Parts Production

One of the most significant benefits of additive manufacturing in aviation is the ability to produce spare parts on demand. Aircraft maintenance organisations must traditionally maintain large inventories of parts to support fleets that may remain in service for several decades. Many of these components are rarely needed but must still be available if, as, or when required.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With additive manufacturing, maintenance providers can store digital design files instead of physical inventory, so when a part is needed, it can be produced locally using certified printing systems. This approach can dramatically reduce storage requirements and shorten delivery times, particularly during aircraft-on-ground (AOG) situations where rapid replacement of a part or parts is critical. Another key advantage is reduced manufacturing lead time as conventional aerospace components often require specialised tooling and multiple machining steps. Additive manufacturing eliminates many of these processes, allowing parts to be produced more quickly and with fewer intermediate steps.

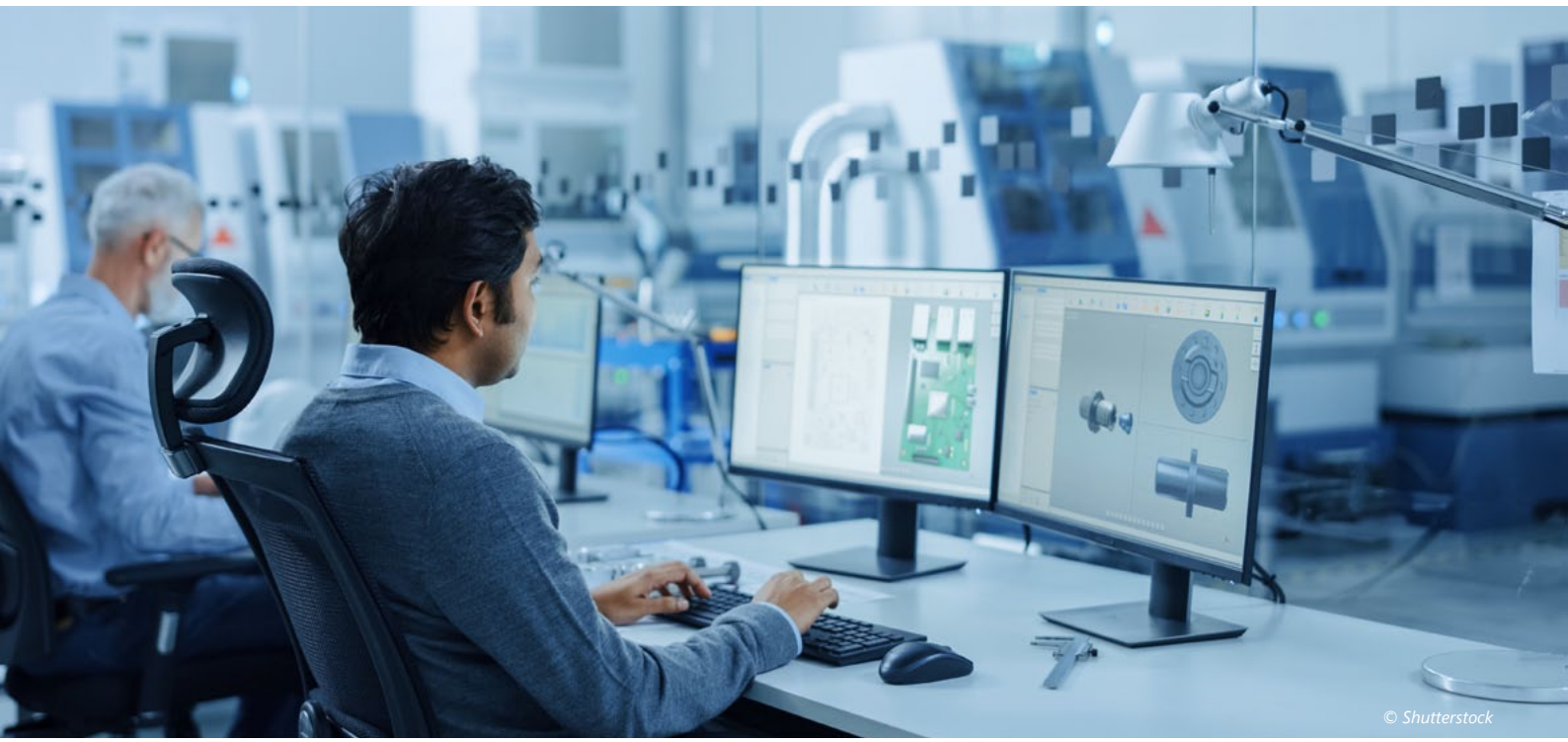
The technology also enables advanced design optimisation. Engineers can create complex geometries that would be difficult or impossible to produce using traditional manufacturing techniques. Methods such as topology optimisation allow designers to remove unnecessary material while maintaining structural strength. As a result, printed components can be significantly lighter than conventionally manufactured equivalents—an important factor in reducing aircraft fuel consumption.

Applications in Maintenance, Repair, and Overhaul

Additive manufacturing is already being used in several areas of aircraft maintenance. One of the most common applications is the production of cabin interior components, which generally face fewer certification barriers than structural parts. Items such as air ducts, seat components, brackets, and interior fittings can often be printed quickly and installed during routine maintenance.

Maintenance facilities are also using additive manufacturing to produce custom tooling and equipment. Technicians frequently require specialised fixtures, inspection gauges, or protective covers that are difficult to source through traditional channels. With 3-D printing, these tools can be designed and manufactured internally, allowing maintenance teams to respond quickly to operational needs.

In more advanced applications, additive manufacturing is being used for engine and structural components. Certain brackets, heat exchangers, and turbine parts are already produced using additive manufacturing processes. These parts benefit from the high strength and temperature resistance of aerospace-grade materials such as titanium alloys and nickel-based superalloys.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Certification and Regulatory Requirements

Despite its advantages, additive manufacturing must meet the strict safety standards required for aviation. Any aircraft component must comply with regulations set by authorities such as the European Union Aviation Safety Agency (EASA) and the Federal Aviation Administration (FAA).

Certification of additively manufactured parts involves extensive testing and process validation where regulators must ensure that printed components possess consistent material properties and structural integrity. This requires careful control of the manufacturing process, including powder quality, printing parameters, and post-processing procedures.

Traceability is another critical requirement as each component must be fully documented, including the digital design file, production parameters, and inspection results. Advanced quality control techniques—such as X-ray computed tomography and non-destructive testing—are often used to verify the internal structure of printed parts.

Toward a Digital Aviation Supply Chain

One of the most transformative aspects of additive manufacturing is its potential to create a digital supply chain where, instead of shipping physical spare parts around the world, manufacturers can distribute secure digital files that authorised facilities can use to produce components locally. This concept enables distributed manufacturing, where certified maintenance hubs or airports operate additive manufacturing systems capable of producing approved spare parts on demand. Such a model can significantly reduce transportation costs and improve the resilience of the aviation supply chain.

However, this approach also introduces new challenges, particularly in the area of cybersecurity. Digital design files must be carefully protected to prevent unauthorised reproduction or tampering and thus secure data management and encryption technologies therefore play an increasingly important role in additive manufacturing ecosystems.

Challenges and Future Outlook

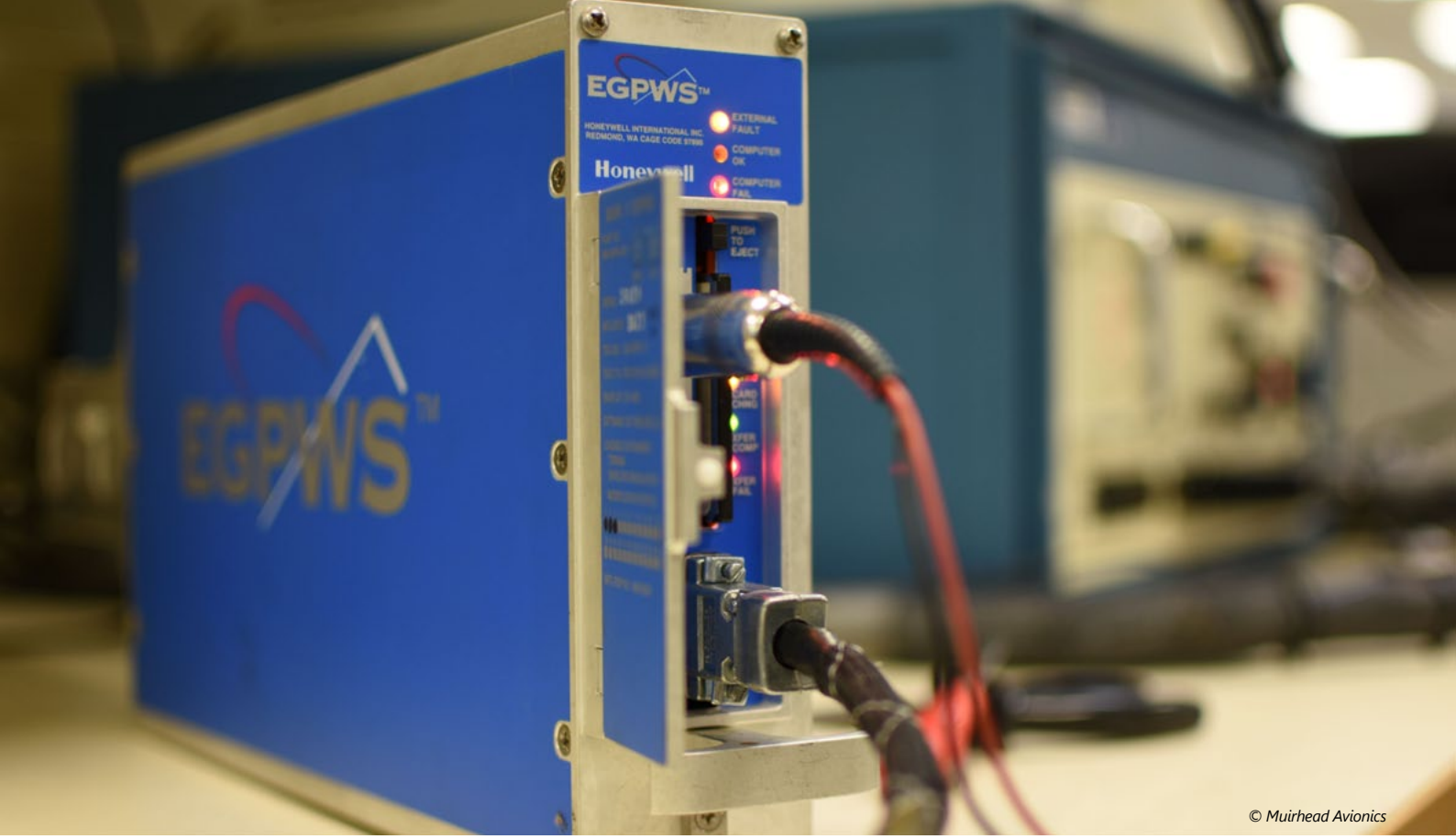
Although additive manufacturing has made significant progress, several challenges remain. For example, certification processes can be complex and time-consuming, especially for critical structural components. Production speed is another factor; while additive manufacturing excels at producing small batches or highly complex parts, traditional manufacturing methods may still be more efficient for high-volume production. Material availability also continues to expand, but the range of printable aerospace-approved materials remains narrower than that used in conventional manufacturing, though ongoing research aims to develop new alloys and improve printing technologies to mitigate these limitations.

Despite these challenges, the future of additive manufacturing in aircraft maintenance appears promising. Advances in printing technology, process monitoring, and materials science are steadily expanding the range of components that can be produced using additive methods. As regulatory frameworks evolve and industry experience grows, there is every likelihood that additive manufacturing will become an integral part of aircraft maintenance operations.

Conclusion

Additive manufacturing is transforming the way aircraft spare parts are designed, produced, and supplied. By enabling on-demand production, reducing lead times, and allowing innovative lightweight designs, 3-D printing offers substantial advantages for airlines and maintenance organisations.

While regulatory, technical, and operational challenges remain, the continued development of additive manufacturing technologies is paving the way for a more flexible and efficient aviation supply chain. In the coming years, digital inventories and distributed production networks may become standard practice, making additive manufacturing a cornerstone of modern aircraft maintenance.



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Trends in Component Management and the Supply Chain

The ever-changing challenges can make component management seem like you are playing three-dimensional chess on a board made of moving sand

By David Dundas

When you consider that a commercial aircraft fuselage such as that belonging to the Boeing 737 MAX or Airbus 320neo families of aircraft is made up of many thousands of repairable and or replaceable parts, and the same applies to engines such as the CFM International LEAP-1B or Pratt & Whitney PW1000G-JM GTF, it is hardly surprising that component management is a vital element of MRO operations. However, on a level playing field, it is not too much of a challenge to hold stock based on those parts more frequently required and those which are rarely needed. Today, that playing field is hardly level and the challenges encountered in component management are greater than they have ever been before.

To begin with, there are major problems with the supply chain where the producers of Original Equipment Manufacturer (OEM) parts are struggling to cope with demand while resources are focused more on the production of new aircraft and engines. Is this really such a surprising scenario as how many businesses do you know which have order books for thousands of units and scheduled production demands that extends for over a decade? Of course, there was a solution that seemed to work well for a while, and that was Used Serviceable Material (USM) or, put more simply, second-hand parts from the teardown of older aircraft that were no longer financially viable.

Unfortunately, this solution was only short lived as, in trying to find some form of balance between using parts for the production of new planes and engines and providing the sales aftermarket sector, manufacturers have failed to ramp-up production to meet demand and many carriers have found themselves having to extend the intended lifespan of their aircraft. This then has had a three-fold negative knock-on impact on the market for USM.

First, the extended lifespan of older aircraft has resulted in a shortage in the number of aircraft available for teardown. Second, this lack of availability has led to a substantial rise in the value of certain aircraft parts, and especially rotables. Last, we have today reached the stage where nearly new aircraft are worth more for teardown than they are as an operational entity, to the point where two-year-old aircraft are now being dismantled because, primarily, there is a critical shortage of certain engines. As an example, currently two P&W GTF engines powering an A321neo are worth more to lease than the entire aircraft as a whole.

So, as an analogy, today, inventory management seems to be akin to playing three-dimensional chess on a board made of moving sand. We wanted to know how businesses were coping with the situation, so we decided to ask some questions.

What are the most significant disruptions still affecting component availability today?

Straight away James Bennett, the Chief Commercial Officer at AerFin highlights problems associated with engines as he comments that: "The GTF inspection programme continues to absorb shop capacity and spares, and it has knock-on effects across leasing, availability of replacement lift, and the wider component ecosystem. Alongside that, you've got three persistent bottlenecks: OEM and tier-supplier capacity - long lead times for castings, forgings, and certain "long-cycle" parts mean production ramps don't translate into immediate availability; repair capacity and labour - strong demand is meeting a technician shortfall and stretched slots, pushing turnaround times out, across component and airframe/engine repair activity, and system-wide backlog - IATA has been clear that demand is outstripping aircraft and engine availability, with a multi-year mismatch that will take time to unwind." He concludes that "The bottlenecks above present clear opportunities for MROs with expanded capacity – such as AerFin – to meet the increased demand." Beyond materials' shortages, Scott Symington, the Chief Commercial Officer at AJW Group points out that: "Disruptions and supply chain volatility are challenges that have become the industry's new normal. They're a business-as-usual reality requiring organisations to build agility and resilience directly into their operating models. Key pressures include ongoing workforce shortages, a critical skills gap, and persistent delays in the delivery of new components and engines. These constraints are compounded by the rapid pace of technological advancement in aerospace, which is increasing both the complexity of components and the demand for specialised expertise." He adds: "Organisations that invest in their people and digital capabilities will be best positioned to adapt to disruptions to maintain operational continuity."

James Bennett, Chief Commercial Officer, AerFin

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Ramona Vintila, Sales Executive – EirTrade Aviation is of a similar mindset to Scott Symington in relation to the dual problem of a shortage in spare parts and skilled labour. She explains further: "OEMs are struggling to source raw materials such as titanium and aluminium which is impacting production of new aircraft and increasing maintenance turnaround times for existing fleets. This issue is due to geopolitical dependencies which amplify the risk when conflicts, sanctions, export controls and other industry requirements occur. These shortages ripple through the industry causing significant delays and increased lead times from repair shops. At EirTrade Aviation we have experienced lead times of up to 10-12 months, delaying turnaround time and creating huge financial constraints on airlines. The extended lead times are impacting AOG requirements and scheduled maintenance while also affecting the market and resulting in cost inflation, particularly for high demand parts. Additionally, aviation is facing workforce and capacity constraints, with skilled technician shortages impacting inspections, certifications and repair turnaround times. Even when parts are available, we see additional lead times due to the high demand for labour and limited workforce to meet this." Looking in a different direction, an interesting and very topical point is mentioned, among others, by Kevin Rimmer, Director of Operations at NEACO, a Jet Parts Engineering company when he points out that: "... tariff uncertainty on critical aerospace metals is increasing landed costs and delaying customs clearance." To a degree, he is pretty much aligned with what has been mentioned above as he advises that "Delayed new aircraft deliveries are extending legacy fleet operations, driving unprecedented demand for mature components. Sub-tier suppliers —

> ***"The GTF inspection programme continues to absorb shop capacity and spares, and it has knock-on effects across leasing, availability of replacement lift, and the wider component ecosystem."***
>
> *James Bennett, Chief Commercial Officer, AerFin*

particularly those providing specialised castings and micro-electronics — continue to face labour shortages and raw material constraints."

Etienne Gombeaud, Executive Vice President of Global Parts Trading at Setna iO, LLC acknowledges that the post-COVID backlog of parts' availability, he suggests that "A lot of the manufacturing seems to be primarily focused on new aircraft and engines, leaving too low capacity dedicated to older programmes. Multiple legacy platforms are also seeing higher usage than predicted (777-200, A380-800, A330 etc...) due to delays in the production of newer aircraft, while the manufacturing of parts has already been scaled down to put focus on newer-generation aircraft. (Neo's, A350's etc...)". He also expresses frustration with the massive disruption caused by, for example, one missing replacement part: "If a subassembly is missing a single piece part it's unable to go back to service and it can quickly clog up an entire product line, providing uncertainty on availability and can be reflected in higher pricing for used material on the market." To briefly conclude the answers to this first question, Yuhei Yagi, the SVP Head of Sales at Werner Aero comments: "Long lead time on repairs is often caused by a lack of supply of piece parts by OEMs."

Are operators shifting toward higher inventory levels, or are they trying to stay lean despite shortages?

Here we were keen to find out if the simplest solution to a shortage of parts is to increase inventory levels, or if the cost of engine parts makes such a policy financially prohibitive. Scott Symington suggests that: "Instead of building large inventories, some operators are turning to integrated support solutions that enable them to remain lean while protecting operational reliability. Flight hour programmes, such as AJW's Power-By-the-Hour (PBH) support contracts, and provide operators with predictable cost structures and guaranteed access to component support without the financial burden of holding extensive stock. This approach is becoming even more relevant as the global fleet undergoes a significant technological transition. The introduction of next-generation aircraft such as the Airbus A321neo and the Boeing 737 MAX brings greater component complexity and more sophisticated supply chain requirements. Managing these evolving ecosystems independently would require substantial inventory investment and technical capability. Support programmes like ours, therefore, act as both a financial hedge and a resilience strategy, allowing operators to maintain a more stable bottom line, while securing reliable access to inventory." However, Ramona Vintila sees it slightly differently to Scott Symington as, in her experience, "... due to this lack of component availability, operators are moving towards higher inventory levels in response to the supply chain challenges, especially for critical items. Most airlines are building buffers where shortages hurt the most and try to stay lean on predictable, low-risk items. Building stock and ensuring parts are available in case of an AOG, particularly for engines, LLPs, and high-value rotables, allows airlines to avoid long shop visits, inspections and delayed AOG turnaround times. Although, high-value units are following this trend, EirTrade is also seeing this with small parts such as seals, connectors etc., as these ensure operators will not have any delays caused by minor issues. Those able to withstand disruptions by leveraging agile inventory strategies will gain a competitive edge in today's disrupted market landscape. Operators are also increasing their inventory levels by pooling their stock, extending contracts with providers and using predictive measures to forecast these shortages."

Kevin Rimmer has a very precise description of the current situation when he tells us that: "The lean model is giving way to a more proactive stance," before going on to explain further. "Airlines are increasingly investing in mission-critical parts that are accessible when and where they're needed. Inventory decisions are also becoming more data driven, with operators leveraging MTBUR (Mean Time Between Unscheduled Removals) metrics to prioritise stock based on real-world operational reliability rather than historical assumptions." James Bennett and Yuhei Yagi also have concise opinions on the current situation. "Operators aren't making a wholesale move away from lean inventory models, but they are rethinking where and how they carry risk," says Bennett, while Yagi points out that: "It depends on the operator, but we have seen cases where operators purchase certain material which have supply chain issues in heavy bulk." However, James Bennett explains further that: "For years, minimising stock was the default because inventory ties up cash and depresses returns. That discipline hasn't disappeared. What has changed is the cost of unpredictability. Extended lead times, volatile repair turnarounds and less reliable delivery commitments mean that a missing part can now have a disproportionate operational impact. As a result, many airlines are holding more inventory in very specific areas - components that are high failure, long lead, or critical to dispatch reliability. These are the parts that create immediate AOG exposure if they're unavailable. For lower-criticality or more interchangeable items, operators are still leaning on pooling, exchange programmes and shared inventory to avoid unnecessary capital lock-up. The net effect isn't a

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>
> *Scott Symington, Chief Commercial Officer, AJW Group*

Scott Symington, Chief Commercial Officer, AJW Group

broad inflation of stock levels, but a more deliberate, risk-based approach to inventory. Operators are prioritising resilience where it matters most, while continuing to manage cost and balance sheet exposure elsewhere."

What are the benefits and risks of relying on shared inventory versus owning strategic stock?

Most operators are now using a hybrid model to maximise the benefits and avoid the risks associated with shared inventory. Utilising a share inventory approach allows operators to lower capital exposure by avoiding upfront investments in expensive rotables and reduce holding costs associated with excess inventory suggests Ramona Vintila. "This approach opens opportunities for scalability through fleet growth and easier exit and entry for fleet types while also providing flexibility with quicker adjustments to demand. Shared inventory also guarantees availability which is critical during AOG disruptions to avoid delays and operational costs. At EirTrade we believe that utilising a shared inventory approach allows operators to improve their operational independence, relying less on OEMs, avoiding bottlenecks and improving control over scheduled maintenance. However, relying solely on shared inventory can cause disruptions for operators. During systemic shortages, shared inventory can become scarce, and larger operators are prioritised for in-demand parts. Sudden fleet-wide demand spikes can leave smaller operators vulnerable, leading to financial losses and delays. With shared inventory, operators have limited control over the specific units provided, which may not always align with their preferred specifications or shop tags. Logistically, access to stock can be slower, particularly in AOG situations, where customs and clearance delays can extend turnaround times and disrupt operations. Additionally, shared inventory often incurs extra costs, including AOG premiums, exchange fees, and logistics surcharges, which can be difficult to manage or avoid," she concludes.

Etienne Gombeaud, Executive Vice President, Global Parts Trading, Setna iO, LLC

Kevin Rimmer seem to feel that shared inventory has many advantages, primarily because it "...gives operators immediate access to critical rotables — including PMA and DER solutions that a growing number of airlines now embrace for supply chain resilience. It also allows access to high-value assets without the cost of dedicated exchange pools. However, shared pools can be depleted during peak demand. Data-driven forecasting helps operators and repair stations identify long-lead-time parts early and stock proactively, balancing availability with cost efficiency." As an alternative, Etienne Gombeaud sees a combination of solid data analysis combined with experience as having great benefits. "Better data analysis tools and returns on experience allow operators to put more focus on stocking only parts they frequently need or are hard to get. This strategy helps in reducing immobilised equity while decreasing unavailability risks to a minimum. That said, the collaboration with USM providers is necessary for a successful supply chain. The strategies between operators are different as some airlines prefer to set up PBH contracts and defer most of the rotables supply to a separate company, while others prefer to keep control of the entire chain internally and own tangible assets," he tells us.

Post providing a comprehensive response to the question, James Bennett sums the situation up well by saying that: "In practice, the best setups blend both - own what can stop your operation, share what can be flexed." By "both", he is referring to shared and owned inventory and advises that: "At AerFin we work with operators and MROs on programmatic solutions; these range from consignment of inventory in their location, component leasing and service level driven structures, all designed to minimise operator risk and provide timely and cost-effective access to inventory." He then goes on to detail the pros and cons of both. For shared inventory, the feels the benefits are: "Faster access without tying up capital, coverage across multiple sites and fleets, increased flexibility, and predictable cost per event if the contract is right." He further advises that risks include: "Availability risk at peak demand - you're competing with everyone else for the same asset and relying on a partner, priority and service-level complexity - performance depends on contract enforcement and provider capacity, and configuration and documentation discipline - traceability, mod status, and paperwork quality can vary between pools if governance is weak." When it comes to owning strategic stock, James Bennett once again sees both positive and negative aspects. From the positive side, he sees the benefits include: "Control - you decide what sits where, and what gets used first; resilience - you're less exposed to market spikes and allocation decisions, and better planning - ownership supports forward maintenance planning and stable operations." Finally, on the risk front, he includes: "Cash and obsolescence - especially when fleet plans change; repair and logistics burden - you need slots, vendors, and internal processes to keep assets serviceable, and wrong-stock risk - buying 'more' is easy; buying 'right' is the hard part"

Another view of the situation is provided by Scott Symington where he suggests that it is fundamentally about balancing risk, capital, and control. He explains in greater detail: "Shared inventory models allow operators to

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> *Etienne Gombeaud, Executive Vice President, Global Parts Trading, Setna iO, LLC*

> ***"Combining USM with PMA and DER alternatives creates hybrid solutions that keep repair pipelines moving and costs manageable — particularly for high-failure components where new production parts are scarce or backordered."***
>
> *Kevin Rimmer, Director of Operations, NEACO - a Jet Parts Engineering company*

Kevin Rimmer, Director of Operations, NEACO - a Jet Parts Engineering company

transfer maintenance risk to a specialist partner such as AJW. PBH provides cost visibility and budget stability, particularly valuable during parts shortages, economic volatility, and inflation. The model shifts unpredictable capital expenditure into more manageable operating costs, while maintaining access to critical components. The trade-off is dependency as operators must be confident in their provider's inventory depth, forecasting capability, and financial strength. Furthermore, they need to consider that they have less buying power versus large-scale PBH providers like AJW. Owning strategic stock offers direct control and immediate access but requires significant capital investment and carries exposure to obsolescence and forecasting risk, particularly as fleet complexity increases. In practice, many operators adopt a hybrid approach. AJW's strategic inventory planning and in-house optimisation platform, Apollo, uses probabilistic modelling to align stock levels with utilisation and risk tolerance, delivering resilience without unnecessary capital burden." To succinctly conclude these answers, Yuhei Yagi comments: "The benefit is not having to use your own balance sheet for the material you offer. The risk is lack of flexibility and agility when trying to sell inventory 'owned' by a separate party."

What role does USM play in solving today's component shortages?

At NEACO, Kevin Rimmer sees used serviceable material (USM) as an essential tool for maintaining the flow of the supply chain. He informs us further that: "Repair stations use USM to harvest piece parts internally, bypassing extended OEM lead times for sub-components. Combining USM with PMA and DER alternatives creates hybrid solutions that keep repair pipelines moving and costs manageable — particularly for high-failure components where new production parts are scarce or backordered." At Setna iO, Etienne Gombeaud is of the same opinion as Rimmer with regard to the importance of USM, as he explains: "USM is key and a necessary alternative to component shortages. Companies like Setna iO use experience and inventory coming from teardowns to provide availability and reduced costs versus the option of new parts. Data analysis allows us to predict and invest in repairs in order to have material ready to go for our customers when they need it."

At AerFin, James Bennett points out that the USM market has now grown to US$7 billion, and he does not see that demand slowing down as it is "one of the few levers that can add real supply at speed - without waiting for new production." He adds that "When teardown and disassembly are done properly, USM can deliver serviceable material into the market quickly, with the traceability and documentation airlines, lessors, and MROs require. It also helps in three practical ways: Bridging lead times - filling gaps while OEM supply and repair capacity catch up, reducing total cost - particularly when paired with smart repair/ recertification decisions, and supporting circularity - keeping assets in service longer and reducing the need for new manufacture. At AerFin, that's where our focus sits - combining teardown sourcing with repair, recertification, and a disciplined approach to documentation so operators can keep aircraft flying with confidence." Scott Symington is also in the camp of OEM helping to speed up operations, as well as it being a cost-effective alternative to a constrained OEM supply. He backs this up by saying that: "With extended lead times on new parts and ongoing production bottlenecks, USM enables operators to access certified components more quickly, reducing AOG risk and supporting fleet continuity. It also offers significant cost advantages, helping airlines manage maintenance budgets. Sustainability is also becoming a key driver as regulators, investors, and the public demand greener operations from the industry. USM extends the operational life of existing components, reduces waste, and lowers the environmental footprint associated with manufacturing new material, which means MRO facilities like AJW Technique, are, essentially, aircraft component recycling facilities. The balance between new and used material will continue to evolve, but USM is no longer a secondary solution, it is a cornerstone of a more sustainable aviation supply chain."

Ramona Vintila at EirTrade Aviation not only comments on the benefits of OEM in relation to filling gaps in inventories left by pooling and OEMs, but also how it is helping to keep older planes flying. "USM has become a critical solution for operators in today's volatile market by helping to fill gaps that OEMs or inventory pooling cannot. USM allows operators to avoid long lead times caused by increased demand and raw material shortages and utilise readily available parts from parts providers like EirTrade that can ship immediately. USM also plays a huge role in reducing AOG turnaround times, from months to days solving operators' component shortages significantly. In the current market EirTrade observes the important role played by USM in allowing older but economical aircraft to continue flying by providing out-of-production parts that OEMs sometimes discontinue. Without USM, many operators would face fleet grounding due to inoperable aircraft. By incorporating USM, operators can

Yuhei Yagi, SVP Head of Sales, Werner Aero

> ***"… operators rely on USM as an alternative 'flexible' solution to support their supply chain."***
>
> *Yuhei Yagi, SVP Head of Sales, Werner Aero*

reduce part costs by 40–60% compared with new OEM components, providing a faster, more cost-effective solution that preserves cash while mitigating operational disruptions. USM has increasingly proven to be a strategic resilience tool, helping operators absorb supply-chain shocks and maintain continuity amid OEM production constraints," she informs us. To conclude, Yuhei Yagi at Werner Aero sees operators relying on USM in moments when you need stock that is ready to be shipped. He also feels that "… operators rely on USM as an alternative 'flexible' solution to support their supply chain."

Are airlines and lessors becoming more open to USM compared with the past?

Craig Skilton, VP Components at APOC Aviation firmly believes that USM will remain a critical source of supply for lessors and airlines on a global basis, advising that ongoing manufacturing delays, persistent supply chain disruptions, and escalating material and production costs continue to constrain the availability of new components, thus reinforcing the importance of alternative sourcing strategies. He goes on to say that: "While regional preferences for new versus USM still exist, at APOC we see that industry sentiment is continuing to shift, and confidence in USM quality, traceability, and performance continues to grow. The expanding maturity of the aftermarket, coupled with a broader range of bespoke support services and tailored solutions, has positioned USM as not only a cost-effective option but often the most operationally efficient pathway for maintaining fleet availability and controlling lifecycle costs." James Bennett concurs in terms of both being materially more open while also being more structured about it. He explains further why: "Two forces are driving that shift. First, availability: when new-part lead times and repair TATs are stretched, USM becomes an operational necessity, not a 'nice alternative'. Second, maturity: the market's approach to traceability, condition, and assurance has improved, as the USM market has matured. Critical in the decision making however is working with a partner with a strong track record and ability to demonstrate a robust pipeline of assets to support future operational requirements. The engine and production constraints affecting fleet availability have kept pressure on spares markets, which in turn reinforces the role of used serviceable material. Lessors are increasingly pragmatic - they want asset protection and strong records, but they also want uptime and cost control. The result is not blanket acceptance, but much wider acceptance with tighter standards."

Here Ramona Vintila is in total accord that USM is now utilised to a greater extent and is no longer seen as a "compromise". She explains further: "At EirTrade we have seen a significant increase in both airlines and lessors becoming more open to USM today than at any point in the past. While at first USM was used predominantly as a cost-driven exception, today it has become a mainstream resilience strategy. USM is fully acceptable under the regulators. Eliminating any quality barriers and with correct traceability, airlines have shifted their mindset and incorporated USM as a key component in their maintenance planning, AOG solutions, and continued fleet operations. EirTrade is pleased to say that USM is no longer viewed as a compromise within the industry and more as a competitive advantage. USM offers cheaper and more flexible solutions for lessors which alleviate their overdependency on OEM and PBH agreements, which in turn encourages operators to incorporate USM in their business models." Kevin Rimmer also sees USM as an almost invaluable element of MRO. In answer to the question, he is unequivocal when he says "Significantly, yes. Airlines today have a more sophisticated understanding of the aftermarket and recognise USM as a valuable tool for balancing maintenance budgets with fleet availability. USM can meaningfully reduce both total cost and

Ramona Vintila, Sales Executive, EirTrade Aviation

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>
> *Ramona Vintila, Sales Executive, EirTrade Aviation*

turnaround time without compromising quality — a proposition that resonates strongly in today's supply-constrained environment."

Etienne Gombeaud is in accord with all respondents here when it comes to the adoption of USM, though adding an element of caution when it comes to very specific items. "In an ever-increasingly competitive market, aircraft availability and cost control is crucial. USM offers a better readiness across a network of dedicated companies. While end-users are clearly investing more in parts stock it's impossible to always have every single part needed in stock ready to go. USM is the best solution to better availability from more varied stock location, all while keeping the cost lower than through the NEW option. USM can be harder to navigate through when looking for specific requirements items such as particular manufacture date or cycle limited items, but most of the time used material is not only accepted but more desirable," he says. To conclude responses to this question, Scott Symington sums the situation up perfectly in a nutshell: "Operators and asset owners increasingly view USM not as a possible option, but as a credible, certified solution that supports fleet continuity, cost control, and sustainability objectives."

What advice would you give to smaller MROs or operators trying to navigate component shortages and rising costs?

Here Kevin Rimmer has sage advice as he tells us to: "Be proactive, not reactive. Introduce PMA and DER alternatives to customers before a shortage forces the conversation — awareness of all available options leads to better decisions on cost and turnaround time. Prioritise reliability upgrades and approved repair processes that extend time-on-wing, reducing overall parts demand. And diversify sourcing by building relationships with independent distributors and part-out specialists to avoid single-source dependency." On top of this, James Bennett suggests you: "Work with partners you can trust. Those who have a strong track record of working with airlines and MROs in providing USM solutions. Get ruthless on criticality - don't stock 'more', stock 'smart'. Build a top 20 list that genuinely drives AOG risk and focus money there. Lock repair capacity early - treat slots like inventory. Multi-year agreements for key commodities can beat spot-buy panic. Labour and capacity constraints aren't going away overnight. Use USM strategically - especially to bridge long lead times, reduce exposure to price spikes, and stabilise operations. Strengthen paperwork discipline - traceability and clear records protect value and accelerate install decisions. Collaborate - pooling and shared inventory can work well for smaller players, as long as service levels and governance are watertight. Work with partners who can blend supply and capability - sourcing alone doesn't solve the problem if you can't repair, certify, and turn parts quickly. That's where an integrated aftermarket partner can take pressure out of the system."

Scott Symington advises that disciplined inventory management is critical; and that success will depend on striking the right balance between service performance and profitability. He expands on this by suggesting: "That means moving beyond simply holding more stock and instead focusing on holding the right stock to align with the demands of customers' fleets. Capital tied up in slow-moving inventory can quickly erode margins, while insufficient coverage risks operational disruption and reputational damage. Agility is equally important. Businesses should strengthen forecasting capabilities, build flexible supplier relationships, and ensure they can position material where and when it is needed. Those that combine data-driven inventory decisions with operational responsiveness will be better placed to navigate shortages and rising costs." Craig Skilton shares common thoughts with James Bennett and Ramona Vintilla in terms of working with trusted partners. Bennett advises that: "Smaller MROs and operators should prioritise diversifying their sourcing strategy to reduce dependency on single suppliers and enhance access to global component inventories. Establishing strong, trusted relationships with USM stockists like APOC, teardown specialists, and approved repair stations is essential to improving supply reliability. Given that many of these organisations operate with lean teams and limited procurement resources, the importance of selecting dependable, high-performing partners is critical, especially in today's market with many suppliers to choose from." Meanwhile, Vintila places greater emphasis on "Building strong, long-term relationships with suppliers and maintaining a reliable industry network can enable smaller MROs and operators to negotiate more favourable commercial terms and improve access to constrained components. This can be combined with selective use of pooled inventory, particularly covering high-usage parts and material identified as having long lead times. This can help to mitigate shortages that would otherwise disrupt operations. In parallel, EirTrade would advise that working with trusted parts brokers and strategically leveraging USM can help reduce procurement costs while providing faster access to material during supply constraints. Finally, strengthening data-driven forecasting and demand planning even where imperfect, allows smaller MROs to anticipate requirements earlier and minimise exposure to predictable shortages."

Craig Skilton, VP Components, APOC Aviation

> ***"Given that many of these organisations operate with lean teams and limited procurement resources, the importance of selecting dependable, high-performing partners is critical, especially in today's market with many suppliers to choose from."***
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> *Craig Skilton, VP Components, APOC Aviation*

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Transition Management for Leased Aircraft

Getting a better understanding of what is required, and why, before returning an aircraft to its lessor

By David Dundas

There are several advantages to leasing an aircraft over buying it, especially if you are a new operator, are looking at a rapid expansion programme, need flexibility to adapt to changing market demands, or want to test new routes. With the option of a straightforward lease, or a sale-and-leaseback agreement, having less money tied up can bring its own benefits, while opting for a lease can also speed up access to certain aircraft types where there is a backlog in deliveries for new ones.

Of course, all leases come to an end, and returning an aircraft to the lessor is not the same as returning a leased car to a dealer where you hand over the keys and the lessor's idea of an inspection is to have a quick look over the bodywork to check there is no major damage, and to check that it has been regularly serviced. In reality, the handing back of an aircraft to its lessor is a highly complex task that requires a myriad boxes to be ticked, the failure to tick just one having the potential to lead to a financial penalty running into millions of dollars. The reason why? Because an aircraft's value is not solely governed by its age or the number of hours it has flown, but also by its entire MRO history as detailed records of its past need to be provided on handover, as well as watertight proof that all requirements of the lease agreement in terms of maintenance and upkeep have been strictly adhered to.

Beyond this, the date a lease comes to an end is known well in advance and the lessor will likely have done one of two things in advance of this date, either leased the aircraft to a new lessee, or sold it to an MRO operative or specialist teardown company for parts. In both instances, if the aircraft is not ready for handover to the new lessee or owner on a specific date, there are likely to be financial penalties which will be passed on to the original lessee. If one then takes into account the severe financial penalties where maintenance records are not 100% complete or where 100% traceability does not exist for all parts that have been renewed or changed, the return of an aircraft at end of lease could be financially crippling for a carrier or MRO set-up.

Consequently, when it comes to handing back an aircraft to a lessor, aircraft transition management becomes a crucial element of the whole process and we wanted to find out more details of what, exactly, is involved. As a consequence, we approached three companies who are highly experienced in the field of aircraft transition management to get their take on things by asking a fairly comprehensive range of questions.

How would you define aircraft transition management in today's leasing and MRO environment?

One thing is for sure. Over the last ten years, a lot has changed, and as Giuseppe Renga, CEO of AMROS Group makes clear, it is a very challenging environment which he feels is underemphasised and chronically understaffed, mostly suffering from historical records challenges and an unclear records landscape and delivery conditions. In turn, he feels this creates an environment where every aircraft transition may bear risks of delayed delivery, which often comes with financial compensations, to say the least. He adds that: "In today's leasing and MRO environment, aircraft transition management is further challenged by regulatory complexity, operational time pressures, technical variability, supply chain stress, market volatility, and stakeholder coordination demands. Successfully navigating these conditions requires proactive planning, digital data management, and collaborative communication across the lease and MRO environment, yet these elements are often underestimated in practice." Additionally, he points out that aircraft transitions are also frequently prone to unexpected costs for component purchases, exchanges, repairs etc., and therefore longer MRO lead times appear very frequently. With over 800 aircraft transitions done at AMROS, the company sees an average of US$4m in unexpected cashouts per aircraft, based on narrow-body variants.

Aircraft transition, like everything, requires teamwork, in this case collaboration between commercial, legal, technical and financial departments. It starts well before the end of lease, typically taking between 9-12 months to confirm and prepare the re-delivery requirements and planning, according to Sergey Starkov, Technical Director at Vallair. He expands further: "Lessors tend to do back-to-back leases and, as such, match redelivery requirements at the end of one lease to the delivery conditions of the next one, which saves on transition costs and minimises downtime. This is an ideal arrangement which works well with relatively young aircraft, but it may not always be the case. For example, jurisdictions should be kept in mind. Transitions within one jurisdiction – for instance, within EASA – are easy, but those which go between different jurisdictions require thorough evaluation of import requirements, such as local modifications and language adjustments. During transition, our records department gets busy going through the drafts of redelivery paperwork, which always generates numerous findings for the operator to rectify. Here at Vallair, we have experience managing these final stages in-house, allowing us to support operators who do not have the resources to manage the costly redelivery process themselves. Simplifying redelivery starts at the very beginning of the lease. Ideally, all technical records should be formatted in the same way they are required to be presented at redelivery. IATA guidelines are the most widespread standard for transition documentation."

Sergey Starkov, Technical Director, Vallair

Meanwhile, Aslihan Ucar, Director of Business Development Türkiye & Middle East for Werner Aero LLC is very focused on the need to plan things well in advance. She advises that "What was once viewed primarily as a maintenance handover process has now evolved into a highly strategic function that sits at the intersection of technical asset protection, commercial risk management, and operational planning. Today's transitions require early planning, strong cross-functional coordination, and very close alignment between operators, lessors, and maintenance providers. They are no longer isolated maintenance events but structured projects that directly influence both operational continuity and asset value preservation." She concludes: "In the current leasing environment, where aircraft frequently move between operators and fleets are constantly being optimised, transition management plays a critical role in maintaining schedule predictability while protecting long-term asset performance."

Why has transition management become more critical in recent years?

Faster lease cycles, ageing fleets, stricter regulations, tighter budgets, and higher expectations for digital records and operational readiness have increased the pressure on transition processes. In addition, since COVID, airlines and lessors both have understood what it means in terms of effort, risk and potential costs, to return an aircraft or redeliver an aircraft, regardless of whether or not the return was scheduled or unscheduled suggests Giuseppe Renga. "Therefore, significant investments are still being made, despite the low aircraft production rate and the following low aircraft transition rate. Mainly, in our opinion, it has become a potential risk factor in terms of costs and operational availability," he concludes. Sergey Sarkov feels that transition management has always been a critical phase in the life of an aircraft, pointing out that: "In recent years, requirements towards records have increased, and not all operators have adapted their records management systems to meet these latest requirements. This is especially true for long-term leases that were initiated several years ago and for mature assets 15-20 years old. However, at Vallair, we are seeing

> **"In recent years, requirements towards records have increased, and not all operators have adapted their records management systems to meet these latest requirements. This is especially true for long-term leases that were initiated several years ago and for mature assets 15-20 years old."**
>
> *Sergey Starkov, Technical Director, Vallair*

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this situation improving over time."

Aslihan Ucar senses that several industry trends have fundamentally increased the importance of transition planning, including lease agreements which have become considerably more technically detailed which, in turn, has increased the level of compliance oversight required during redelivery. "At the same time, global supply chain constraints and ongoing propulsion system availability challenges have reduced maintenance flexibility and extended component turnaround times. Another major factor is the increasing frequency of aircraft trading between operators throughout the asset lifecycle. Each transition introduces new regulatory, technical, and documentation challenges, and in many cases, these challenges are underestimated during early planning stages," she says, adding that: "... geopolitical instability and regional conflicts continue to disrupt logistics networks, material flow, and maintenance capacity. From what we have observed in recent years, these external pressures have transformed transitions into major cost and schedule drivers for both operators and lessors, making structured transition governance more important than ever before."

What are the most challenging aspects of lease return and redelivery projects?

Sergey Starkov sees challenges coming from both sides of the fence, as in from both the lessor's and operator's perspective. He identifies that "For the lessors, the challenge is securing co-operation from the operator. From the operator's perspective, their priority is to operate aircraft, not to edit records paperwork so that redelivery conditions are met. There are instances when issues arise due to operators taking the attitude that lessors are 'overdemanding' with their lease return requirements. However, when the two work together and operators allocate enough resources to the transition, the return runs smoothly. If the operator lacks such resources, then management of the transition can be sub-contracted. There are companies like Vallair which provide such services for operators and lessors. For some airlines, it is cheaper to sub-contract these services to an experienced team than try to manage it themselves. Additionally, a specialist team will make sure that the lease ends as scheduled, something which is paramount for an operator to achieve, as they must continue to pay for the aircraft in the event of a delay until redelivery is accepted by the lessor."

Looking at the situation from a different angle, Aslihan Ucar identifies three key areas that present the greatest challenges: technical findings, documentation integrity, and timeline control. She explains: "Heavy maintenance events often reveal structural discrepancies or configuration misalignments that were not previously visible during routine operations. These findings can rapidly expand project scope and cost exposure. However, in my experience, technical records remain the most sensitive and often underestimated risk area. Documentation gaps, incomplete traceability, or differences in interpretation of return conditions frequently delay acceptance even when the aircraft itself is technically compliant. Managing these variables under strict contractual timelines, while coordinating multiple stakeholders with competing priorities, remains one of the most demanding aspects of transition management."

Giuseppe Renga then adds two more challenging aspects relating to redelivery conditions, namely: the lack of correct aircraft parts, LLP traceability status and a lack of dedicated staff to take care of the dynamics of aircraft transitions. He goes on to tell us that: "Lease agreements return conditions are often not in line with the airworthiness regulation, but more focused on lessors own asset value reason or lack technical understanding of aircraft, creating unpleasant scenarios which are often hard to solve without proper dedication. This is particularly critical when there are unclear or misinterpreted return conditions, incomplete aircraft status, and limited technical oversight, which can quickly escalate into complex technical and commercial discussions. Lastly, projects have strongly moved toward remote management with aircraft records and transition tools – the personal factor gets a bit lost and may result in that simple issue that could be solved easily and fast in-person, becoming unnecessarily complex without the human factor."

How early should an airline begin preparing for a lease return event?

All three of our respondents are of the same opinion regarding the timeline, but with some interesting and thoughtful riders. Aslan Ucar advises that: "Leading operators typically begin structured redelivery planning approximately 12 to 18 months before the contractual return date. This timeline allows sufficient opportunity to perform detailed lease analysis, assess asset conditions, and validate technical records," adding that: "For assets requiring major component shop visits, particularly engines or landing gear, preparation often needs to begin significantly earlier. Due to current shop capacity limitations and material lead times, we increasingly see operators extending planning horizons to 24 to 36 months for propulsion systems. Early engagement consistently improves cost control, reduces operational disruption, and provides greater flexibility when unexpected findings occur. In today's environment, delayed planning almost always results in increased financial exposure."

Sergey Starkov certainly believes that you can't start thinking about a lease return too soon when he suggests that: "Ideally, operators should begin thinking about the lease return during delivery, when the lease starts. They should set up their own maintenance information software in a way that keeps the necessary data for the lease return. Some lessors may impose certain requirements for parts replacement and modifications, so this must be kept in mind from the start of the lease as well. Actual preparation for redelivery starts 9-12 months before the end of lease. For the lessor, preparations start well in advance as they look to find the next lessee or buyer and schedule transition in a way that minimises downtime. After all, it would be inefficient to have an aircraft redelivered without a next lessee lined up – there would be zero income and storage charges would accumulate. For airlines, preparing for redelivery in advance allows them to prebuild transfer records and update technical specs for the next lessee. Finding an MRO where redelivery is to take place is also key. Slot availability, workscope confirmation, and pre-arrangement of parts are all major considerations. The MRO provider should be experienced and familiar with the leasing business, as they will need to deal with a number of unscheduled, last-minute tasks depending on the redelivery review process. At Vallair, we are well versed in the leasing business and have an established delivery and re-delivery process designed to support customers through aircraft transition."

In accord with the other two, and succinctly put, Giuseppe Renga advises that: "12 months ahead should be the first step to discuss with lessor the scope of the transition, define return conditions, transaction perimeter. Six months before, records should be built up, if not already done with a tool like LISA, and cleaned up and reviewed internally before publishing to the lessor."

What are the most common causes of redelivery delays?

Two things become apparent when looking at the responses to this question. First, there seems to be no specific, regularly identified problem and, second, any problem which arises tends to be unexpected. As Sergey Starkov puts it, "Normally, it is 'that one item' in the redelivery conditions which is, in many cases, something different from a lease agreement the operator may have had previously. Perhaps there is some de-modification to do or an MRO delay. Also, completion of the redelivery maintenance itself can often be delayed. In many cases, an aircraft should be returned in the same condition as when it was delivered, meaning it has to be cleared for at least the next sequential C check or 6Y check. Sometimes, landing gears may require overhaul, or engines may need restoration. In some cases, like these, settlement with the lessor may be a solution." Beyond the above, Aslihan Ucar highlights that "Most redelivery delays originate from issues identified too late in the transition timeline. Structural findings discovered during heavy maintenance, parts availability constraints, and limited shop capacity remain major contributors to schedule disruption. That said, documentation discrepancies continue to represent one of the most overlooked delay drivers. Many acceptance delays are not caused by physical non-compliance, but by incomplete historical traceability or differing interpretations of contractual requirements. In nearly every transition project, early alignment between stakeholders on documentation expectations significantly reduces acceptance risk and prevents costly last-minute negotiations." To conclude, Guiseppe Renga adds, concisely: "Unavailable aircraft records and insufficient tracking of maintenance documentation evidence remain the primary causes of redelivery delays. In addition, missing records, unexpected technical findings, supply or MRO constraints, and coordination gaps frequently contribute to extended timelines and operational disruption."

Giuseppe Renga, CEO AMROS Group

> **"Unavailable aircraft records and insufficient tracking of maintenance documentation evidence remain the primary causes of redelivery delays. In addition, missing records, unexpected technical findings, supply or MRO constraints, and coordination gaps frequently contribute to extended timelines and operational disruption."**
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> *Giuseppe Renga, CEO AMROS Group*

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How do operators balance operational needs with the heavy downtime required for redelivery maintenance?

From an operational standpoint, the most successful airlines treat redelivery as a long-term fleet strategy rather than a final maintenance event. This mindset shift often determines the overall success of the transition program Werner Aero's Aslihan Ucar informs us. She also suggests that: "Operators that consistently achieve smooth redeliveries typically adopt phased maintenance strategies. By gradually incorporating compliance items into scheduled maintenance visits, they significantly reduce peak workload during final redelivery checks. Fleet planning discipline is equally important. Stabilising aircraft configuration, ensuring adequate rotable availability, limiting late-stage modifications, and maintaining operational backup capacity all contribute to successful transition execution." Giuseppe Renga at AMROS Group on the other hand, looks at things from a slightly different angle. "Frequently, aircraft transitions represent peaks in resource demand, which is why often the task of records build-up and auditing is outsourced to service partners. This cuts the operational staff significant slack, considering also that transitions may not be a daily business for an operator, so know-how could be an issue as well." To conclude, Sergey Starkov at Vallair summarises the solution to the challenge by suggesting that "The ideal scenario is to plan maintenance for the low-operation season – winter, for example. In any case, operators anticipate the event so it can be planned in advance. Redelivery maintenance is still routine maintenance, which is normally carried out anyway, but with varying scope."

How important are technical records in determining transition success?

Here, Sergey Starkov, Giuseppe Renga and Sergey Starkov are all very much in agreement as to the crucial role technical records play. Starkov suggests that: "The sooner a draft of redelivery records is available, the sooner the lessor's team can start checking it. Such drafts will also allow sooner review by the next lessee or buyer. Any issue would be addressed for correction, so that the final version would be just updated at the end of lease. Having such records in good shape as early as possible also benefits the operator. The sooner the lessor can find a next home for the aircraft, the greater the chances of them closing the current lease quickly." Renga feels that "They are the key success factor of every transition. Technical records are crucial for transition success because they provide the complete history of an aircraft's maintenance, modifications, airworthiness compliance, while also preserving the aircraft's value and marketability. A bad, incomplete and inconsistent records evidence of aircraft maintenance can break a transaction which can cause delays in transactions or, if the aircraft is sold, even for a customer to

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walk away from a deal." Meanwhile, Ucar feels that: "Technical records are often the single most influential factor in transitional outcomes. While physical discrepancies can usually be corrected through maintenance action, documentation gaps can create significant commercial exposure and delay aircraft acceptance." She adds that "Reliable traceability, clear maintenance evidence, and consistent record governance not only support regulatory compliance but also strengthen the operator's negotiation position during redelivery settlement discussions."

How do digital records systems improve—or complicate—transition management?

Here Giuseppe Renga can see only positives in terms of the benefits of digital records systems. "They definitely improve the transition management as they digitalise and automate tedious and inefficient review processes with software landscapes that are not made for managing aircraft records (e.g. legacy document management systems like SharePoint or Dropbox etc.). They can facilitate communication down to records level and provide quick metrics and KPIs related to records quality and availability. We do not see any complication in records processes," he tells us. Aslihan Ucar, however, sees both plus points and negative points when it comes to these systems On the plus side, "Digitalisation has significantly improved records accessibility, audit transparency, and project coordination. Modern digital platforms allow real-time monitoring of compliance status and enable faster stakeholder collaboration," she says, but adds that "... However, digital systems can also introduce complexity, particularly when historical data has been migrated across multiple legacy platforms or when data governance standards vary between organisations. We frequently see that digital tools deliver maximum value only when they are supported by disciplined data validation processes and standardised documentation practices. Technology alone does not solve records' challenges — structured data management does."

Aslihan Ucar, Director of Business Development Türkiye & Middle East, Werner Aero LLC

Aircraft transitions involve airlines, lessors, MROs, and regulators—where do coordination failures most often occur?

According to Aslihan Ucar, here coordination breakdowns most often occur at stakeholder interface points, with one of the most common issues being misalignment between contractual return conditions and the technical execution scope during maintenance events. She adds that: "Delays also occur when decision-making during maintenance findings is not clearly structured or when documentation ownership responsibilities are not well defined. These risks become significantly more pronounced when parts supply is constrained or when regional disruptions affect manpower and logistics availability. Successful transitions rely heavily on clearly defined governance structures, transparent communication channels, and early agreement on escalation and decision-making frameworks." On the other hand, Giuseppe Renga is of the opinion that "Coordination failure often lays in the asynchronous flow of information and expectations. It is crucial to involve all the stakeholders early enough to clearly define responsibilities, accountability and expectations from each other. Often the coordination failures therefore end up in not enough transparency of information and lack of dedicated stakeholder management."

What advice would you give to maintenance teams managing their first major redelivery?

Aslihan Ucar has a wealth of sound advice, pointing out that "For organisations managing their first major redelivery, structured planning and early risk identification are essential. Translating lease return conditions into detailed operational work scopes and checklists provides critical execution clarity. Conducting early technical records audits and maintaining continuous communication with lessors significantly improves transition predictability. It is also extremely valuable to engage experienced transition specialists, as lessons learned during initial projects often define long-term organizational capability and cost efficiency. Given ongoing instability in global parts supply and propulsion system availability, early engagement with OEMs, MRO providers, and technical consultants is becoming increasingly important to mitigate risk and maintain schedule reliability."

Sergey Starkov, on the other hand, is quite blunt when he advises that you should "Start everything as soon as possible." He then goes on to advise that "Clarity in redelivery conditions and subsequent delivery conditions is very important to keep the project on time, within budget and within agreed scope. Here at Vallair, we have pre-set steps and checklists for different stages of the redelivery process, as well as templates of files produced to IATA standard, which help manage the everything efficiently," while to conclude, Giuseppe Renga has three very precise suggestions: "Prepare, prepare, prepare," he says, while advising that you should also communicate proactively with all stakeholders.

> **"Digitalisation has significantly improved records accessibility, audit transparency, and project coordination. Modern digital platforms allow real-time monitoring of compliance status and enable faster stakeholder collaboration."**
>
> *Aslihan Ucar, Director of Business Development Türkiye & Middle East, Werner Aero LLC*


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Maintenance Mythbusters: "If It Looks Fine, It Probably is Fine"

How many times do we hear the expression "Everything may not be as it seems"? This is particularly relevant when it comes to the visual condition of any aircraft.

By David Dundas

The Danger of Trusting What the Eye Can See

There is no doubt that there is still a place for the experienced eye of a skilled mechanic to spot if something doesn't look right. However, it would be naive to think that the airworthiness and reliability of an aircraft need only depend on visual inspections. This is especially so when we know that the majority of faults, or potential faults, are usually not visible from the onset. Hairline cracks which are invisible to the naked eye, and which can result in the failure of a part can exist for some time prior to the part malfunctioning. In other words, following the path of believing that "If it looks fine, it probably is fine" may feel intuitively correct, but can only lead to serious, if not fatal problems down the line as, in reality, many of the most serious maintenance threats develop quietly beneath the surface, long before they can be detected by sight alone.

Hidden Defects in a High-Stress Environment

The biggest problem with aircraft maintenance is that everything operates under extreme conditions and therefore, if there is a flaw in any material or part, when it fails, the result can be catastrophic. Pressurisation cycles, vibration, temperature variation, moisture exposure, and aerodynamic loads create continuous stress on structures and systems. Over time, this stress produces fatigue cracks, corrosion, insulation breakdown, and material degradation that may remain invisible until the damage becomes advanced. A fuselage skin may appear flawless while microscopic cracking grows around fastener holes. Wiring bundles may look intact while insulation deteriorates internally. Bearings may run smoothly until early-stage spalling progresses into sudden failure. In aviation, the absence of visible symptoms does not equate to the absence of any risk.

Why Visual Inspection Alone Is Insufficient

As mentioned, there is no question that the trained eye of an experienced

mechanic is invaluable when it comes to inspecting an aircraft. The problem is, that alone is insufficient because of the nature of the type of damage caused by stress. In addition, so many areas of an aircraft are inaccessible where visual inspection is concerned, so to say that such an inspection is superficial is relatively accurate when the term is used literally. Many failure modes occur inside sealed structures, behind panels, within engines, or beneath protective coatings. Composite materials, now common in modern fleets, can suffer significant internal damage from impact without showing obvious external deformation. Likewise, corrosion may begin in hidden cavities long before it becomes visible on the surface. Relying solely on what can be seen creates a false sense of security and can allow defects to progress unnoticed.


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The Role of Non-Destructive Testing and Advanced Inspection

Because the nature of so much damage caused to an aircraft is hidden or invisible to the naked eye, especially in its early stages, maintenance in the aviation sector relies heavily on non-destructive testing methods. Here we are referring to techniques such as ultrasonic testing, eddy current inspection, radiography, and dye penetrant analysis which allow technicians to identify cracks, voids, and structural anomalies long before they become apparent externally. These methods are not optional extras; they are fundamental to maintaining structural integrity and preventing unexpected failures. Modern aircraft maintenance programmes are built around the understanding that airworthiness depends on detecting what cannot be seen, as opposed to simply confirming what appears to be normal.

Operational Pressure and the Persistence of the Myth

The perpetuation of the myth "If it looks fine, it probably is fine" is partly owed to the pressures and time constraints placed on engineers and technicians responsible for the maintenance of an aircraft. The AOG time is so costly, swift turnaround times and the constant demand to return aircraft to service quickly means that for maintenance teams there is a constant temptation to accept visual normality as ample reassurance. However, time and time again, aviation history demonstrates that small, hidden defects are often the starting point of major incidents. As a consequence, today, maintenance is not only about responding to obvious damage; it is about anticipating degradation before it becomes visible or critical.

Human Factors and the Limits of Perception

Human factors also play a role in reinforcing the myth that if it looks fine, then it probably is as even experienced technicians can be influenced by expectation bias. In simple terms, if something is assumed to be serviceable, subtle warning signs may very easily be overlooked. Fatigue, distractions, and repetitive tasks can each further reduce the likelihood of noticing small defects and irregularities, which is why aviation maintenance depends so heavily on systematic inspection requirements rather than subjective judgment alone. Procedures, inspection intervals, and diagnostic tools exist to compensate for the natural limitations of human perception.

Modern Maintenance: Seeing Beyond the Surface

As aircraft systems have become so much more advanced, maintenance has increasingly become dependent on data-driven monitoring and predictive approaches where it is now aircraft health monitoring systems, engine trend analysis, and digital maintenance records which provide an insight into developing issues that cannot be visually noticed. While a component may appear in perfect or near-perfect condition, it may well be that performance data can indicate varying degrees of early deterioration. Modern maintenance has, to a degree, become more efficient and safer as we have shifted from reactive discovery to proactive detection, combining technician expertise with technology to identify risk before it becomes a visible failure.

Conclusion: Airworthiness Is Not Always Visible

Ultimately, the belief that "If it looks fine, it probably is fine" is one of the most dangerous oversimplifications in aircraft maintenance. Aviation safety depends on understanding that critical defects often develop silently, beneath surfaces, inside structures, and within systems that appear outwardly intact. Visual inspection remains a vital first step, but it can never reveal the full picture. The true strength of aviation maintenance lies in disciplined procedures, advanced inspection methods, and the recognition that airworthiness is not always something the eye can confirm. In aircraft maintenance, what cannot be seen is often what matters most.

PEOPLE

on the move

Guy Danon

Pentagon 2000 has promoted **Guy Danon**, previously Managing Director Europe, to Global Head of Sales and Marketing — a move that reflects the company's strategy of developing internal talent to lead its global growth. Building on Pentagon 2000's ongoing international expansion, including the establishment of its European headquarters in Paris, France, Guy Danon will now oversee the company's global sales and marketing operations. With more than 25 years of experience in international enterprise software roles, Guy brings a strong track record in building and leading teams across global markets. His expertise, together with Pentagon 2000's continued commitment to innovation — including its latest release, Pentagon Upstream — further strengthens the company's ability to support global growth and deliver value to customers.

Aengus Whelan

Aergo Capital has promoted **Aengus Whelan** to Chief Commercial Officer, expanding his responsibilities to lead the company's global commercial strategy. Whelan joined Aergo in 2024 as Chief Trading Officer, where he oversaw aircraft acquisitions and sales and played a key role in strengthening the company's trading platform. In his new role, he will take responsibility for Aergo's overall commercial direction, including aircraft acquisitions, sales and portfolio development. He brings more than 32 years of experience in commercial aviation. Prior to joining Aergo Capital, Whelan served as Chief Commercial Officer at Seraph Aviation. Earlier roles include Managing Director and Head of Trading at ALAFCO and Executive Director of Aviation Finance at Standard Chartered Bank. He also spent more than a decade at Pratt & Whitney, working across several divisions including maintenance planning and sales. Since joining Aergo, Whelan has helped expand the company's industry relationships and enhance its aircraft trading capabilities. His promotion reflects Aergo's confidence in his leadership and his contribution to the company's continued growth.

Stephen O'Dwyer

SMBC Aero Engine Lease B.V. has announced the appointment of **Stephen O'Dwyer** as Chief Commercial Officer at SAEL, effective March 2026. O'Dwyer brings extensive experience in the aircraft and engine leasing sector, with a strong track record in commercial strategy and in building relationships with airlines and OEMs. Most recently, he served as Senior Vice President, Airline Marketing, EMEA at SMBC Aviation Capital, where he led commercial activities and strategic airline engagement across the EMEA region. Prior to this, O'Dwyer held key commercial leadership roles at Goshawk and SKY Leasing, contributing to portfolio growth and strengthening customer relationships across multiple markets. Earlier in his career, he developed significant financial and analytical expertise through roles at ASL Aviation Group and KPMG. O'Dwyer's broad commercial and financial background provides the perspective and leadership needed to support SAEL's continued growth and strategic direction within the engine leasing industry.

PEOPLE

on the move

Sébastien Kubler

Sébastien Kubler has assumed the role of Chief Operating Officer (COO) at JCB Aero, part of AMAC Aerospace Switzerland, marking the successful completion of the planned transition in the company's operational leadership. AMAC Aerospace has confirmed that the transition process has now been finalised, ensuring continuity across JCB Aero's operational and engineering activities. This development represents an important step in strengthening the company's leadership structure as it continues to support its customers and expand its capabilities within the aviation sector. Kubler brings extensive technical expertise and long-standing experience within the organisation to his new role. He previously served as Technical Director Production & Engineering at JCB Aero, where he played a key role in overseeing engineering activities, production operations and programme execution. His appointment as COO reflects both his technical competence and his strong relationships with employees, partners and customers across the aviation marketplace. Prior to joining JCB Aero, Kubler founded Kreative Engineering Services (KES), a PART21 organisation specialising in aviation engineering solutions. KES subsequently became part of the AMAC Aerospace Group of Companies, further strengthening the group's engineering capabilities. Kubler has also previously worked with AMAC Aerospace Switzerland, providing him with a broad understanding of the group's operational framework and strategic direction. With a career spanning engineering, production management and programme delivery, Kubler's background provides valuable continuity across JCB Aero's core activities. His leadership is expected to further support the company's commitment to delivering high-quality engineering and completion solutions to customers worldwide. As part of the AMAC Aerospace Group, the company also reaffirmed its full commitment to JCB Aero. AMAC Aerospace will continue to support the company's development, investment and long-term success as it further strengthens its position within the global aviation market.

Scott Stoki

Duncan Aviation has confirmed the promotion of **Scott Stoki** to Vice President of Engine Operations. A highly experienced professional with a strong technical foundation and many years at the company, Stoki's elevation reflects Duncan Aviation's ongoing focus on delivering advanced MRO services and sector-leading expertise to aircraft operators. Stoki takes over from Doug Alleman, who will retire at the end of the year after 38 years of service. The succession plan ensures operational stability for customers, while leveraging Stoki's more than two decades of hands-on industry experience to enhance engine reliability and further reduce aircraft time out of service. Stoki joined Duncan Aviation in 2005 as an Engine Line Technician. Progressing from hands-on work in the hangar to roles in Quality Assurance and later into management, he has developed a comprehensive, end-to-end understanding of the maintenance process. This breadth of experience enables him to translate complex engine technicalities into practical solutions aligned with the strategic needs of flight departments.