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NOVEMBER/DECEMBER 2025 • VOLUME 27 • ISSUE 8

MRO

Management



SHIFT IN

MOMENTUM

2025 has set new forces
in motion for the year ahead

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A MOVING TARGET

The latest changes to US tariffs
on imported aircraft parts

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3D PRINTING

The flexibility and efficiency
of AM-produced parts

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COST CONTROL

Why component repair often
delivers better value

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Maximize aircraft systems' health and performance with easy access to full series flight data

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WELCOME...

As we wrap up 2025, it has been another standout year for *MRO Management and Aviation Business News (ABN)* – a year defined by growth, record-breaking milestones and an ever-more engaged global community.

In October, we surpassed last year's personal best and published our biggest ever issue, and a real reflection of the ambition driving today's MRO sector. Packed as always with in-depth features, interviews and analysis, the response to the issue was fantastic, and it proved the perfect copy to share at MRO Europe in London.

Our events programme also reached new heights. September saw our first APAC edition of the *Predictive Aircraft Maintenance (PAM) Conference* in Singapore, where airlines including Singapore Airlines, Korean Air, ANA and Peach Aviation provided deep insight into their predictive maintenance journeys. Just weeks later in November, our Europe edition in Dublin became our largest yet, welcoming over 250 delegates, with more than 50 global operators and 55 speakers. It was particularly pleasing to have British Airways, Ryanair and Vueling join us on stage for the first time, alongside returning contributors such as Aer Lingus, United, Delta and many others. You'll find a full event review on page 20.

The momentum carries into 2026, with PAM returning to both Europe and APAC, and the launch of PAM MENA on February 2-3 in Dubai. We're excited to bring these conversations to another



▲ The MRO Management and ABN team at PAM Dublin 2025 in November

key region – and to continue providing a platform that remains the place to connect, collaborate and share new ideas.

This year also saw the introduction of our '*Meet the Mechanics*' interview series on *aviationbusinessnews.com*, shining a light on the hands-on professionals who keep aircraft in peak condition. Their stories have resonated strongly, and we look forward to sharing many more in 2026.

Furthermore, we were equally proud to recently announce our *2025 Best Places to Work in Aviation* winners, determined through independent research by Workforce Research Group. Congratulations to the winners and the award will return next year to spotlight even more examples of workplace excellence.

Thank you for your support throughout 2025. We're excited to see what 2026 brings – for us and for the global MRO community. ●

Craig Waters

Editor

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Winner of Business
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Independent Publisher
PAWARDS 2024
Winner

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PUBLISHED BY

Real.
RESPONSE MEDIA

Unit 4, Cally Yard, 445 Caledonian
Road, London N7 9BG



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Hangar Talk.

News from across the industry



Marabu Airlines

COMPONENT SUPPORT

Lufthansa Technik wins extended TCS contract from Marabu Airlines

Estonian carrier Marabu Airlines has strengthened its relationship with Lufthansa Technik by extending its Total Component Support (TCS) agreement for several more years.

The renewed contract will see Lufthansa Technik continue to provide comprehensive component supply for Marabu Airlines' expanding Airbus A320neo fleet.

Marabu and Lufthansa Technik have collaborated since the airline launched operations in 2023.

Under the extended TCS agreement, Marabu will retain access to Lufthansa Technik's global pool of serviceable spare parts, repair services and logistics support – a setup designed to ensure high component availability and rapid turnaround times across the fleet.

The partnership already spans consumables and expendables supply, aircraft engineering services and certification support.

Marabu Airlines' Laszlo Molnar said: "Our partnership with Lufthansa Technik supports Marabu's continued

growth and ambition. As our fleet expands, having a strong technical partner allows us to maintain the high operational standards our passengers and partners expect."

Lufthansa Technik's Tanja Pustolla said: "We are honoured that Marabu have not only extended but also expanded their contracts with us. For us, as a company in Germany, Marabu is even more special since they offer flights out of several German airports. We have established a very successful working relationship, and it is a privilege being part of Marabu's growth."



LINE MAINTENANCE

Wizz Air renews Romanian MRO deal with FL Technics

European LCC Wizz Air has renewed its long-term partnership with FL Technics, extending line maintenance support at the airline's key Romanian bases in Bucharest (OTP) and Cluj-Napoca (CLJ).

The agreement strengthens a relationship that now spans more than a decade and underscores the strategic importance of Romania within Wizz Air's fast-growing network.

FL Technics' expanding European footprint and Wizz Air's sustained fleet growth continue to drive closer operational alignment between the two companies.

FL Technics' Saulius Bajarunas said: "We have been working with Wizz Air for over a decade now. During this time, we have built a very deep understanding

of their needs and always support the airline anywhere we can.

"Our goals in Romania fully align with Wizz Air's vision – both of us recognise this region as of strategic importance and plan to invest heavily into future development."

The renewed cooperation is expected to deepen service integration and reinforce maintenance reliability across two of Wizz Air's highest-traffic bases.

“
Our goals in Romania fully align with Wizz Air's vision - both of us recognise this region as of strategic importance



BRIEFS

- BCT Aviation Maintenance has invested in new hangar equipment and airside EVs ahead of a full winter maintenance schedule at East Midlands Airport, which will see 12 Boeing 737NG checks carried out through March 2026.

- Aircraft Propeller Service's newly opened MRO facility in Malaysia has overhauled its first batch of Collins Aerospace 568F propeller blades, representing the first time this type of propeller has been overhauled in-region.

- StandardAero has broken ground on an approximately 70,000 sq ft expansion to one of the company's facilities in Winnipeg, MB, which provides full MRO support for the CF34-3/8 and CFM56-7B turbofan engines.

- Air France Industries KLM Engineering & Maintenance (AFI KLM E&M) has extended its partnership with Shenzhen Airlines and subsidiary Kunming Airlines through a new three-year CFM56-7B engine maintenance contract running from 2025 to 2027.

- WOLF Holding, part of Avia Solutions Group, is seeking to raise \$500 million to acquire mid-life narrowbodies including Boeing 737s and Airbus A320s. The company will also consider selective investments in widebodies and engines.

IN NUMBERS

1,000

Jet2 employs over 1,000 engineers and trains more than 30 apprentices

12

BCT Aviation Maintenance will perform 12 Boeing 737NG checks by March 2026

70,000

StandardAero has begun a 70,000 sq ft expansion at its Winnipeg facility

**DIGITALISATION**

European Cargo to utilise GAMIT's ROAM solution

GAMIT has been awarded a five-year contract to digitalise the technical records of European Cargo's fleet using its ROAM (Records Online Asset Management) digital records management solution.

European Cargo will utilise ROAM to enhance efficiency in its operations and seamlessly manage the technical documentation generated by its fleet, using ROAM's unique functions and integrations to monitor and manage airworthiness compliance.

European Cargo's Priit Kimmel said: "Selecting ROAM as our technical records management platform represents a key step in our digital transformation journey. The system's intuitive design, powerful data analytics

and secure accessibility align perfectly with our commitment to maintaining the highest airworthiness standards."

GAMIT's Chris Leese-Wood said: "Our collaboration reflects a shared commitment to operational excellence, reliability, and forward-thinking digital transformation across the aviation industry."

“Selecting ROAM as our technical records management platform represents a key step in our digital transformation journey

**LINE MAINTENANCE**

HAECO expands MRO partnership with JAL at Shanghai airport

> HAECO has expanded its line maintenance partnership with Japan Airlines (JAL) at Shanghai Pudong International Airport, marking the first time JAL has entrusted an overseas MRO provider with advanced, non-routine maintenance tasks including technical inspection, lubrication, testing and cleaning at one of its key outstations.

HAECO's Gerald Steinhoff said: "This partnership not only reflects JAL's confidence in HAECO's best-in-class capabilities but also reinforces our long-standing collaboration, which has steadily expanded in scope and geographic coverage over the years."

Takashi Koimai from JAL Engineering said: "As an airline committed to the highest standards of flight safety and overall service quality, striving to be the most preferred airline by customers worldwide, we are pleased to have a long-standing partner who can support our service."



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“As our fleet expands, having a strong technical partner allows us to maintain the high operational standards our passengers and partners expect”

Laszlo Molnar, technical director, Marabu Airlines



Markus Mairhofer/Adobe Stock

ENGINE MRO

SalamAir extends LEAP-1A support relationship with StandardAero

StandardAero has extended its relationship with SalamAir for MRO support for the CFM International LEAP-1A turbofan engine.

The new non-exclusive General Terms Agreement (GTA) paves the way for StandardAero to provide Oman's low-cost carrier with LEAP-1A performance restoration shop visits (PRSVs) in support of the airline's fleet of A320neo family narrowbody aircraft.

Adrian Hamilton-Manns, SalamAir's chief executive, said: "Today's announcement with StandardAero represents a key pillar in our ongoing LEAP-1A strategy."

"As a fast-growing LCC with a 15-strong fleet of A321neo aircraft we require strong partners who can support our ambitions. The need for increased engine support is critical to keep our expanding fleet operational."

"StandardAero's ability to support quick turn shop visits and their overall approach to meeting our needs place them as a key partner in our growth plan."



HEAVY MAINTENANCE

Pegasus and Turkish Technic deepen collaboration on A320neo maintenance

MRO provider Turkish Technic and Pegasus Airlines have strengthened their longstanding collaboration through two new agreements covering landing gear overhaul and base maintenance services for Pegasus' Airbus A320neo fleet.

Under the contracts, Turkish Technic will provide comprehensive landing gear overhaul support over the next six years, alongside continuous base maintenance across two dedicated lines between autumn 2025 and winter 2026 – ensuring high levels of reliability and operational efficiency for Pegasus' growing fleet.



Jet2

WORKFORCE

Jet2 calls for overhaul of aviation engineering apprenticeship funding

Jet2 is urging the UK government to increase funding for aviation engineering apprenticeships, warning that the current £27,000 cap covers only a third of actual training costs.

The airline – which employs over 1,000 engineers and trains more than 30 apprentices – said the sector faces a growing skills gap, with over a quarter of engineers set to retire within a decade.

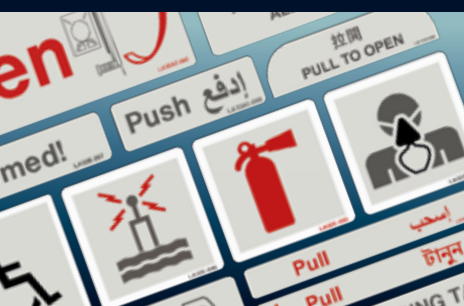
Jet2 wants reform of the skills levy and a reversal of plans to lower the age limit for Level 7 apprenticeships.

CEO Steve Heapy said: "Jet2 has tremendous opportunities for apprentice engineers, providing well-paid jobs with great career opportunities. Aviation is grounded without these trained engineers, so it is vital that the government addresses the skills shortage which is now staring the industry in the face."

66

It is vital that the government addresses the skills shortage which is now staring the industry in the face

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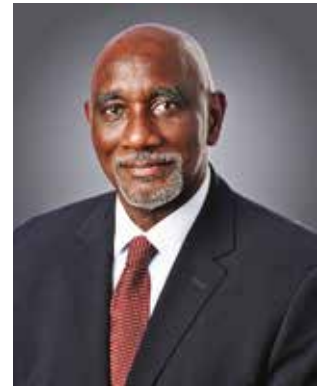
The latest partnerships, appointments
and innovations advancing the MRO sector



<

ACMI

Mohammed Bin Rashid Aerospace Hub has announced that Avia Solutions Group (ASG) will establish its new regional headquarters at Dubai South. The move supports ASG's global expansion and will bolster its ability to meet rising demand for ACMI and integrated aviation services across the Middle East.



^

PEOPLE NEWS

Aviation Technical Services (ATS) has announced that Jimmy Hill (pictured above), an expert in USM and airframe and engine maintenance, has joined its executive leadership team as senior vice president for Ranger Air Aviation, the largest independent MRO in North America. He replaces Rob Hill who is retiring the post since founding Ranger Air in 2002 with a small number of partners.

∨

MERGERS & ACQUISITIONS

SK AeroSafety Group has acquired UK-based Reheat Aero, an independent MRO specialist in galley and cabin interior products. The deal strengthens SK's global component repair capabilities. Reheat, founded in 1998, operates a 16,000 sq ft facility in Alton, Hampshire, close to major London airports. Financial terms of the transaction were not disclosed.



^

PEOPLE NEWS

LOT Aircraft Maintenance Services (LOTAMS) has appointed Tadeusz Stachera (pictured above) as president of its management board. Stachera will also continue to lead LS Technics, combining the experience and expertise of both organisations within the Polish Aviation Group. Stachera has extensive experience in the aviation industry including as an aircraft mechanic and CAMO and AMO director.

∨

MRO CERTIFICATION

Dornier Technology has been certified by the US FAA as a Foreign Repair Station, authorising the Clark-based MRO to perform heavy maintenance up to D-Check on the Airbus A320 family, including both ceo and neo variants powered by CFM56, V2500 and PW1100G engines.





Roman Titospolsky/Adobe Stock

NEW FACILITIES

STS Line Maintenance (STS), a division of STS Aviation Group and the largest independent line maintenance service provider in the US, has opened a new satellite station in Vero Beach, Florida (VRB). The station will begin operations on December 1, 2025, and support JetBlue Airways as its launch customer.

AIRCRAFT PAINTING

Aircraft painting and coating specialist, MAAS Aviation, has extended its agreement with Airbus for the painting of A320 and A220 aircraft in Mobile, Alabama, for five years. The facility, which expanded to five dedicated paint bays in 2024 and can paint up to 200 aircraft a year, supports the ramp-up of Airbus' single aisle production programme.



PEOPLE NEWS

Commercial and defence aircraft MRO and interior solutions provider, Avianor, has appointed Mario Lafrance (pictured above) as its new vice president and general manager, following the planned retirement of long-serving industry leader Hugo Brouillard, who will remain with Avianor until December 2025 to ensure a smooth handover.



TRENDING STATS

15

SalamAir operates a 15-strong fleet of A321neo aircraft (from Hangar Talk feature, p.06)

300

IAI has delivered more than 300 converted cargo aircraft (from Company Profile feature, p.20)

\$70M

Embraer Services & Support recently broke ground on a new \$70m facility in Texas (from 2025 Review/2026 outlook feature, p.26)

17%

Between 2021-2024, Collins Aerospace saw 17% growth in total repairs across Europe (from Component Repair feature, p.44)

DUBAI

2 - 3
FEBRUARY



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2025 Testimonials

"I spent the last two days in Dublin representing Aegean Airlines at the PAM Europe 2025 conference. It was inspiring to hear operators share insights from their predictive maintenance journeys - some well underway, others just beginning. One thing is clear: predictive maintenance will soon be an industry standard."

Emmanouil Nanos, Reliability and Maintenance Programme Engineer, Aegean Airlines



"Thank you to the PAM Europe team for fostering a collaborative environment and insightful exchanges on the digital transformation of our sector. These discussions and case studies highlight just how crucial innovation and teamwork are to advancing predictive technologies in aviation."

Mike Roemer, Director, Digital Fleet Management, United Airlines

"This year's discussions offered a sharp, practical look at the real predictive maintenance journey - not from theory, but directly from the experiences of operators like Ryanair, easyJet, Delta Air Lines, United Airlines, Vueling Airlines, Aer Lingus, British Airways and Condor Flugdienst GmbH."

Amanjot Singh Bhambra, Aircraft Systems Specialist, Wizzair UK



Year-end United States tariff update

Jason Dickstein outlines the latest changes affecting US tariffs on imported aircraft parts and explains how companies can challenge incorrect duty assessments

Tariffs have become an interesting issue and a moving target for the aviation industry. Up until now, most aircraft parts have entered the United States (US) duty-free under the Agreement on Trade in Civil Aircraft, which has been in place for over 40 years. However, 2025 has seen dramatic changes in the way such imports are handled.

Chapter 99 tariffs have been levied against goods based on where they were produced. The rules for origin can be complicated, but most 'original equipment' aircraft parts removed from aircraft or engines will be products of the country in which the aircraft or engine was assembled, while most replacement parts will be products of the country in which the article was manufactured (which may be different from the country in which it was approved/certified).

For a short time, aircraft parts produced in the European Union (EU), Japan or the UK were subject to country-based tariffs matching the country of origin. These Chapter 99 tariffs were found in Chapter 99 of the Harmonized Tariff Schedule of the United States (HTSUS). They overrode the traditional 'duty-free' treatment of imported aircraft parts, creating an obligation to pay duties on those parts when imported by the aviation community.

Today, most aircraft parts originating from those three jurisdictions (EU, Japan and the UK) are once again free from



“Tariffs have become an interesting issue and a moving target for the aviation industry”

JASON DICKSTEIN

president, Washington Aviation Group

Chapter 99 tariffs, but this duty-free status is qualified based on the specific nature of the parts being imported (we will get to that later in this article).

Table 1 shows current Chapter 99 import treatment of aircraft parts based on the origin (not all possible countries of origin are listed).

The term 'Aircraft Parts' in Table 1 is meant to describe a set of HTSUS codes that are listed in the Notes to the Harmonized tariff Schedule of the

United States. Some aircraft parts may fall outside of this list, and those parts may be subject to the additional Chapter 99 duties charged for goods imported from the particular country of origin.

Note also that Table 1 represents general Chapter 99 duties applicable to aircraft parts and may not represent special situation tariffs, such as those associated with aluminum, steel, etc.

The 'Duty-free' elements as shown in Table 1 really means a return to the pre-2025 treatment without the additional Chapter 99 tariffs. If the base tariff code for the aircraft part in question was subject to non-zero duty, then the aircraft part continues to be subject to that duty.

For example, tempered safety glass for aircraft would be imported under 7007.11.0090 and would be subject to a 5.5% duty rate; while steel lock washers imported under heading 7318 are subject to 5.8% duty.

On the other hand, new tyres for civil aircraft are imported under HTSUS 4011.30.0010, and they bear no additional duty based on this primary tariff code.

A lot of people make the mistake of bringing in all aircraft parts under heading 8807. This is frequently incorrect because there are many other tariff codes that apply to aircraft parts, and the import regulations require the importer to select the most accurate description of the imported goods.

Embraer parts from Brazil are still subject to import duties of 10%. This is a bit of a break when compared to other Brazilian products that are subject to duties of up to 50% or more, but it is still an unexpected expense.

Imported aircraft parts that originate from other jurisdictions around the world are still typically subject to import tariffs. For example, parts manufactured in Vietnam would be subject to a 20% duty under HTSUS 9903.02.69.

Tariff protests

If you believe that you were charged the wrong amount of duty for your import, then you can file a protest with CBP.

We have had several clients come to us with errors on their tariff bills. This can arise due to a number of reasons. Examples include the tariff charged not being applicable on the entry date, the customs broker (or the exporter) mischaracterising the base tariff code, or standard Chapter 98 exceptions being properly claimed or recognised.

There is another reason why some people might want to file tariff protests.

TABLE 1

Country of Origin		Current Tariff on Aircraft Parts*		HTSUS Chapter 99 Subheading		Example
Brazil	▶	10%	▶	9903.01.82 9903.02.09	▶	Embraer parts manufactured in Brazil
China	▶	35%	▶	9903.01.24 9903.88.01	▶	Parts manufactured in China
European Union	▶	Duty-free	▶	9903.02.76	▶	Airbus parts manufactured in France
Japan	▶	Duty-free	▶	9903.96.02	▶	JAMCO parts manufactured in Japan
United Kingdom	▶	Duty-free	▶	9903.96.01	▶	Rolls-Royce parts manufactured in the UK

The Federal Circuit Court has ruled that some of the tariffs imposed by the US (particularly under Chapter 99) were illegal. This case was *V.O.S. Selections v. United States* and was decided on August 29, 2025. This decision is currently stayed pending a Supreme Court appeal.

During oral arguments before the Supreme Court on November 5, the Justices seemed wary of the tariffs and signaled a possibility that they would uphold the Federal Circuit's decision. If the Supreme Court agrees that the Chapter 99 tariffs were illegal then this could mean that companies need to file

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“If you believe that you were charged the wrong amount of duty for your import, then you can file a protest with CBP”
”

protests to preserve their rights to obtain a refund of improperly charged duties.

There is a chance that the Supreme Court could withhold their opinion until as late as June 2026, and some companies might surrender their right to protest if the protest period has closed while waiting for the decision. So, it also might make sense to file a tariff protest based on the *VO.S.* decision and ask the CBP to hold a decision in abeyance, pending the Supreme Court decision on the matter.

How to file

The importer, their broker, or their attorney can contest CBP decisions

relating to imported merchandise. The protester needs to file a formal protest within 180 days of liquidation.

Liquidation can happen at any time from the date of entry to one year after the entry, so the time limit for protests will be 180 days after the entry, plus the amount of time it took for liquidation of the entry.

Protests and petitions are generally filed on CBP Form 19, but they do not need to be filed on this form (there is no legal requirement to use this form). This form provides instructions on what is required to file a protest.

Protests may be filed electronically in the ACE Protest module or they

can be filed by paper submission at the port where entry was made. The Protest application provides an online form that enables trade or CBP users to add a protest record to the ACE Protest Module.

Importers who believe that they have been improperly charged an inappropriate duty may wish to consult with an attorney about filing a protest. We do recommend very carefully laying out the legal basis for the protest because CBP is facing a large volume of protests, so the legal analysis needs to be very clear to ensure it is recognised and respected by a reviewer who may need to address the protest quickly. ●

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PREDICTIVE AIRCRAFT MAINTENANCE 2025

INDUSTRY EXPERTS UNITE AT PAM DUBLIN

From demonstrating how to handle data at scale to best practice in embedding new technology, PAM Dublin 2025 showed how airlines, OEMs, MROs and startups are reshaping the future of aircraft maintenance

The 2025 *Predictive Aircraft Maintenance (PAM) Conference* in Dublin closed on November 12 after two packed days at the Gibson Hotel – marking the largest PAM event ever delivered, with more than 250 delegates, over 50 global operators and more than 55 speakers across 30 sessions.

Chaired by Richard Brown, managing director of NAVEO Consultancy, this year's programme put airlines firmly in the spotlight. Leading carriers from Europe and the Americas unveiled real-world predictive maintenance strategies, operational case studies and digital transformation journeys – underlining that predictive is no longer a distant ambition, but a live operational reality.

Airline spotlights

Ryanair opened the conference with a high-impact session from Peter Hayden, director of maintenance planning, charting the airline's evolution from largely reactive planning a decade ago to a fully data-driven ecosystem supporting more than 630 aircraft.

Hayden showed how predictive analytics, digitalisation and smarter planning tools are enabling the airline to scale towards 800+ aircraft while maintaining industry-leading reliability.

British Airways' senior technical engineer, Stephen Rayner, followed with a detailed look at BA's past seven months of accelerating its predictive maintenance capability. He emphasised how organisational readiness,

cross-functional collaboration and cultural change have been critical to shifting BA away from predominantly reactive maintenance and embedding predictive insights across engineering, supply chain and planning.

Rayner said the programme represents “a fundamental shift in the way BA Engineering is working”, moving the organisation from reactive interventions to proactive and predictive strategies designed to improve operational reliability.

Vueling's predictive maintenance engineer, Marc Perez, delivered an operator's view of day-to-day predictive maintenance adoption, sharing practical examples of integrating predictive insights into live operations and

EVENT REVIEW

1. The dedicated engines panel
2. Jeff Smith from Parker Aerospace
3. Aidan Kearney from easyJet
4. Valentin Lewandowski from Aer Lingus
5. Aude Fagour from AFI KLM E&M
6. Matias Bjerregaard from SAS
7. Conference Chairman Richard Brown with Ryanair's Peter Hayden



highlighting where predictive workflows generate value under real-world airline constraints.

Aer Lingus' engineering data services manager, Valentin Lewandowski, expanded the narrative with the carrier's progress in building efficient predictive algorithms with limited resources and its evolving use of AI in collaboration with IAG.ai – illustrating that meaningful results are possible even without unlimited budgets.

EasyJet also outlined how its fast-evolving predictive maintenance programme is transforming engineering performance across its 350-strong fleet, delivering major gains in availability, reliability and manpower efficiency. The airline's head of maintenance operations, Aidan Kearney, said the its journey since 2014 has been driven by the need to move beyond what he called “a reactive based reliability system” that, while strong, was “unable to predict failures” and offered “no further significant gains in reliability” under traditional processes.

“Our objective was to analyse aircraft component behaviour in flight using existing system sensors, and then use algorithms based on engineering design data, OEM tolerances and operator feedback to identify suspect components,” Kearney told delegates.

He added: “We now have better reporting and oversight of both insourced and outsourced maintenance,



“Alongside the airline content, major OEMs, MROs and technology providers spotlighted their latest predictive advancements”

which in turn gives us better understanding of the fleet, leading to more mature contracts and better use of manpower – the most precious resource in engineering.”

In a joint presentation, Condor’s CAMO predictive maintenance engineer, Pascal Ramali, and Airbus digital solutions customer success manager, Petros Manaras, illustrated how the airline is developing a data-driven culture using analogies from professional sport – emphasising leadership support, mastering fundamentals and team empowerment as the key drivers of Condor’s predictive transformation.

The airline-led content concluded with LATAM Airlines and Aviatar,

where Lufthansa Technik’s senior engineer for predictive maintenance, Peter Golibrzuch, and LATAM’s deputy manager for predictive maintenance, Enzo Luizetto, showcased co-developed predictive models deployed across several aircraft types, resulting in measurable reductions in operational interruptions and improved maintenance efficiency.

Airline panel: Moving beyond recreational maintenance

A major focal point of the conference was the airline panel on the shift away from ‘recreational maintenance’.

Moderated by Lee Hayhurst, editorial director of *Aviation Business News* (ABN), the session brought together easyJet predictive maintenance specialist Craig Lynch, SAS predictive maintenance specialist Matias Bjerregaard, United Airlines’ manager of engines and APUs predictive maintenance engineering, Shruta Shankar, and Delta’s manager of predictive technology engineering, Dustin Ames.

Together, they explored how predictive tools are being operationalised at scale to eliminate unnecessary checks, enhance reliability, focus manpower where it truly matters and support smarter forward-planning – moving predictive from a niche engineering project to a core operational discipline.



OEM, MRO & technology leadership: Scaling predictive capability

Alongside the airline content, major OEMs, MROs and technology providers spotlighted their latest predictive advancements.

GE Aerospace’s director of remote operating and technical operations, Derek Cedillo, and vice president of product management, Nate Hicks, showcased how advanced analytics and AI are enabling operators and MROs to optimise maintenance operations through improved detection, richer insights and smarter interventions across fleets.

Boeing’s principal senior technical fellow of maintenance strategy and vision, Darren Macer, examined fleet-wide modelling, component health prediction and how early detection workflows can reduce maintenance burden, extend component life and align predictive alerts with regulatory expectations.





François-Xavier Zakrzewski from Safran Nacelles and Edouard Lesellier from Safran Landing Systems, together with SAS' Matias Bjerregaard, demonstrated the value of health monitoring across nacelle and landing systems support – showing how component-level insights are feeding directly into maintenance decisions.

From Liebherr, programme manager of health management, José Ribeiro, presented predictive models for the A320 family developed using real-time operational data to increase accuracy and enhance availability.

Airbus' Skywise predictive maintenance airline representative, Manuel Saucez, and head of digital services business, Fabrice Villaumé, unveiled the most significant expansion yet of the S.FP+ platform, positioning it as the industry benchmark for predictive modelling, cross-fleet visibility and decision support.

Engine maintenance: Big data, AI & real-time diagnostics

A dedicated engines panel session brought together insights from Delta Air Lines, CTS Engines, GE Aerospace and United Airlines. Speakers Amanda Bock, Jared Butson, Honor Powrie and Zack Silverman explored how predictive tools are extending engine life, reducing disruptions and enhancing decision-making across varied engine platforms.

Additional engine-focused content included ITP Aero's manager of digital services, Daniel Barredo, and CHC leader of technical operations, David Barron, presenting full-flight AI diagnostics that have significantly reduced AOG events – a powerful example of how real-time data, when properly harnessed, can translate directly into fewer disruptions and smoother operations.

Data quality & supply chain integration

Beyond individual platforms, several sessions tackled the broader predictive ecosystem, from data foundations to material availability.

Justin Spaulding, president of The 145, presented on how aviation marketplaces support predictive readiness, while EXSYN chief executive, Sander de Bree, underscored the importance of connected, context-rich data as the bedrock of any successful predictive programme. Armac Systems' founder, Micheál Armstrong, outlined how predictive signals can shape inventory planning and supply chain responsiveness – ensuring the right part is in the right place before an issue becomes critical.

MRO collaboration was represented through Revima's Vikram Singh, who discussed data-driven partnerships with operators, while Collins Aerospace value stream leader,

1. Richard Brown, PAM Conference Chairman and Managing Director of NAVEO Consultancy
2. SITA's Victoria Platt
3. Simon Phippard from Bird & Bird
4. PAM Dublin 2025 audience members
5. easyJet's Craig Lynch

Brian McHugh, showcased the Ascentia model for collaborative predictive maintenance adoption.

Teledyne's data specialist of aircraft data services, Bobby Burkett, demonstrated how legacy aircraft data sources can be digitised and transformed to support predictive workflows. Jason Reed, president of the digital solutions group at GA Telesis, unveiled "WILBUR", a blockchain-enabled registry for global component lifecycle tracking – highlighting the growing role of secure data sharing in the predictive ecosystem.

A dedicated panel on end-of-life strategy examined how the USM market is responding to longer aircraft lifecycles and tightening teardown capacity. Moderated by Richard Brown, the session brought insights from Conor O'Brien, technical director at EirTrade Aviation, Melvin Kelly, senior vice president of technical at Jackson Square Aviation, Gavin Simmonds, chief executive at APOC Aviation, and Vallair chief commercial and marketing officer, Pascal Parant. Together, they highlighted how data, forecasting and closer collaboration are helping align teardown activity with fleet requirements – reducing lead times, mitigating availability risks and keeping maintenance programmes on schedule.

The Digital Alliance

This session brought alliance members Collins Aerospace, Airbus, Delta Air





“PAM’s global community will continue to be the place where the next chapter of predictive maintenance is written”

Lines, GE Aerospace and Liebherr to the same stage, moderated by Craig Waters (*MRO Management* editor). Speakers Thomas Novelle, Fabrice Villaumé, Dustin Ames, Nate Hicks and Pierre Escudier-Donnadieu offered updates on collaborative model development, data standards, interoperability and the shared tools underpinning reliable predictive decision-making.

The discussion underlined that no single organisation can ‘own’ predictive maintenance and that common data models, shared standards and aligned objectives are vital to unlock full value.

Startup innovation

New for the conference in 2025, the ‘Startup Voices’ session injected fresh energy into the programme, showcasing innovators including Baleen Labs, Eclipse Propulsion, Aermetric and AIXI, with presentations from Dr Chandy Wicks and Dan Jones, Sean Bushkov and Cameron Byrd.

A panel moderated by easyJet’s Craig Lynch followed the startup presentations, bringing further insight from Sam Deeble (Baleen Labs), Sean Bushkov (Aermetric), Cameron Byrd (AIXI) and Sean Simons (Robot Toolworx). Together, they showed how smaller, agile players are tackling specific pain points in data capture,

analysis, engine health and tooling – and how their solutions can plug into larger airline and OEM ecosystems.

Predictive maintenance & regulation: Navigating airworthiness & legal risk

A significant discussion on the regulatory landscape was chaired by Jeff Smith, head of product programmes at Parker Aerospace, featuring Edgaras Knyzas, head of CAMO at Heston Airlines, Boeing’s Darren Macer, Bird & Bird of counsel aviation and aerospace specialist, Simon Phippard, and GAMIT ROAM development manager, Andrew McGregor.

The panel examined certification, liability, traceability and how regulators such as EASA, the FAA and the UK CAA are aligning with the rise of predictive systems. The dialogue made clear that predictive maintenance is no longer a grey area: regulators are actively engaging with data-driven maintenance, and the frameworks for approval, oversight and accountability are quickly maturing.

A landmark edition – and a growing global community

Event organisers *Aviation Business News (ABN)* and *MRO Management* would like to thank the event’s speakers, sponsors and delegates for

1. Liebherr’s Pierre Escudier-Donnadieu during the Digital Alliance panel discussion
2. Andrew McGregor from GAMIT

contributing to the most successful PAM event yet. With powerful airline case studies, deep technical sessions, and growing engagement from OEMs, MROs, regulators and start ups, PAM Dublin 2025 established itself as a landmark edition in the evolution of predictive maintenance.

Across two days, delegates heard how predictive tools are being embedded in day-to-day operations, how different organisations are overcoming cultural and data challenges, and how collaboration is turning isolated projects into scaled, resilient capabilities across fleets and geographies.

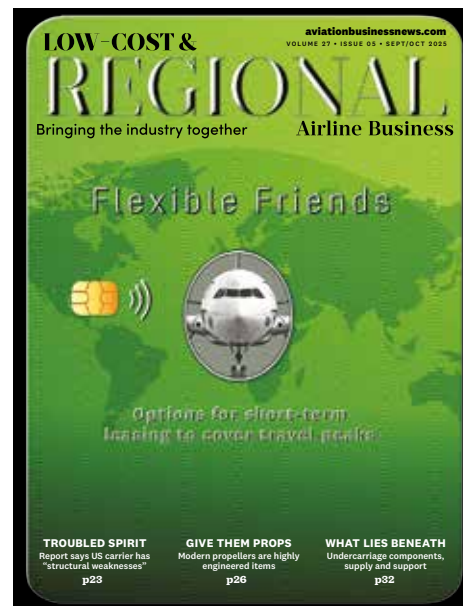
PAM in 2026: Building the next chapter

The PAM series of conferences will grow even more in 2026. The APAC and Europe editions will return, alongside a brand-new MENA edition taking place on February 2-3, 2026 in Dubai – bringing the predictive maintenance conversation into one of the world’s most dynamic aviation regions.

As airlines push for higher utilisation, OEMs and MROs race to unlock new efficiencies, and regulators lean in on data-driven safety, PAM’s global community will continue to be the place where the next chapter of predictive maintenance is written – together, in real time, by the people who are making it happen.

If you would like to nominate yourself or a colleague to speak at a future PAM conference, please contact Craig Waters at craig.waters@aviationbusinessnews.com and add your voice to the growing movement that is redefining reliability for the future of aviation. ●






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SHIFT IN MOMENTUM

After a year of strain and strategic adaptation, the forces shaping MRO in 2025 are setting 2026 into motion. As momentum begins to shift, **Kevin Rozario** finds the industry still facing pressure to evolve

As aviation continues its post-pandemic recovery, 2025 has emerged as a pivotal year for the MRO

industry. The sector is experiencing robust demand, driven by maximised fleet utilisation and a surge in widebody operations. But it hasn't all been good news. Growth has been tempered by persistent supply chain disruptions, labour shortages and cost pressures, exacerbated by tariffs.

Industry leaders have had to recalibrate strategies to meet evolving customer expectations and operational realities. Airbus estimates that the MRO market has grown around 9% year-on-year. A spokesperson from the OEM's services team tells *MRO Management*: "Even though the industry faces supply chain difficulties and skilled workforce scarcity, demand is very high and investments and innovation are booming."

The company highlights the increasing use of used serviceable materials (USM) as a "stabilising force" in the supply chain, though US tariffs have created new pressures. "The main impact has been a rise in costs for parts and components," says the spokesperson.

Embraer's vice president of MRO services, Frank Stevens, says 2025 has been "a very positive year" for the Embraer Services & Support division. The company broke ground on a new \$70 million facility in Fort Worth, Texas, which will boost E-Jet capacity in the US by 53%. Furthermore, globally, Embraer's MRO footprint has extended



▲ Embraer Dallas-Fort Worth MRO facilities

to over 80 authorised service centres and 13 Embraer-owned service centres. Stevens notes: "One of the main demands from customers is that companies significantly expanded their capacity and capability worldwide."

At ST Engineering, president of commercial aerospace, Jeffrey Lam, describes 2025 as "a dynamic year that brought both challenges and opportunities", a common sentiment. While demand has remained strong, he points to providers facing global trade tensions, persistent supply chain constraints and a tight labour market for skilled technicians. At the same time, Lam says, "Technology continues to be a positive driver. The industry is seeing advances in digitalisation, automation and AI-driven processes, which are helping to enhance efficiency, reduce downtime and improve reliability."

Talent and training: a mixed picture

In 2025, staffing emerged as both a bright spot and a pain point. Lufthansa Technik has seen notable success in recruitment by onboarding hundreds of new employees.

"In August, we welcomed a record number of students in Germany, successfully filling every single position we offered," says spokesperson Michael Lagemann. "In total, more than 1,000 people are now undergoing an apprenticeship or dual studies."

However, there are ongoing challenges. Kane Ray, head of general aviation and aftermarket at aviation intelligence firm IBA observes: "A critical observation that divides opinion is the ability and experience of the blue-collar workforce. Some see improvements, while others report shortages and inexperience which



1



2

1. ST Engineering LEAP-1A engine technician. 2. AMETEK MRO technician. 3. Aero Norway engine mechanics



Laurent Bouissou, divisional vice president, AMETEK MRO

have incurred delays. Smaller MROs and suppliers to MROs point to a lack of internal system innovation that could address process improvements.”

Supply chain: a persistent drag

Despite pockets of improvement, supply chain issues have been the most cited negative across the industry.

Aero Norway’s chief commercial officer, Jeremy Colin, points to “extensive lead times due to delays from part repair companies, OEMs providing new parts, and the low availability of USM”.

To mitigate these challenges, Aero Norway has improved material forecasting, implemented material exchange programmes, increased its internal capacity and enhanced overall flexibility.

David Stewart, partner (aviation and aerospace) at global management consultancy Oliver Wyman, comments: “There are limited signs of improvement in supply chain performance and the availability of materials and parts, leading to longer turnaround times (TATs) and increased work-in-progress and working capital.”

Laurent Bouissou, divisional vice president at Ametek MRO describes 2025 as “a very busy year, but with some serious challenges”. He elaborates: “Air traffic has finally caught up with 2019’s record level, yet the supply chain has not recovered, with ongoing issues related to availability and price. In parallel, airlines are becoming more concerned with inflationary pressures and the MRO industry is finding itself squeezed between increasing costs, scarce resources and very demanding customers.”

Stewart adds that “rising costs – whether from OEM price increases or higher labour expenses to retain staff – are challenging MRO margins and airline partnerships”. He also flags global tariffs as a source of uncertainty, impacting both costs and customer relationships.

Operational complexity rises, but investor confidence too

A sobering view also comes from Pascal Parant, group chief commercial and marketing officer at Vallair. “In 2024, many fellow MRO businesses were anticipating 2025 would be a difficult year – and this has proven true,” he says.

Parant cites a dramatic drop in lease transitions, from 30 annually to just two or three, as airlines extend leases due to delivery delays and engine maturity issues. Seasonal compression and aggressive price negotiation have further complicated revenue models. “If operators can generate another month of revenue, they will do so, even if it means sacrificing MRO slot commitments,” Parant explains.

There are warnings, too, from paint companies. MAAS Aviation secured another 10-year MRO painting contract with Ryanair and a five-year deal with easyJet thanks, it says, to its focus on continuous improvement, raising quality standards and ensuring market-leading TATs.

However, the company’s chief commercial officer, Richard Marston, says: “We continue to see low lease transitions, resulting in lower painting requirements as operators extend leases due to new delivery delays.”

“AIRLINES ARE BECOMING MORE CONCERNED WITH INFLATIONARY PRESSURES AND THE MRO INDUSTRY IS FINDING ITSELF SQUEEZED BETWEEN INCREASING COSTS, SCARCE RESOURCES AND VERY DEMANDING CUSTOMERS”

Laurent Bouissou, divisional vice president, Ametek MRO

Despite the not-insignificant headwinds of 2025, investors have not been deterred, and strategic expansion has continued, as highlighted by Embraer's new openings. Oliver Wyman's Stewart says: "The MRO sector has experienced sustained growth alongside strong demand for parts and services. With most engine and hangar facilities operating at, or near, full capacity, MRO pricing has remained robust."

"The industry has also seen vibrant momentum in M&A, underscoring strong investor confidence. Moreover, ongoing passenger demand – particularly for widebody aircraft – has driven life-extension efforts on these platforms."

These trends suggest that while operational challenges persist, the sector remains attractive for long-term investment.

A brighter horizon in 2026?

While 2025 has tested the resilience of MRO providers, it has encouraged innovation, expansion and strategic recalibration, while underscoring the importance of agility, collaboration and investment in both technology and talent.

Parant says, "At Vallair, we see a positive turning point ahead and anticipate that 2026 should be significantly stronger."

For MRO managements, the challenge now is to convert short-term strains into long-term gains by balancing capacity with capability, and cost with customer value.

"IN 2024, MANY FELLOW MRO BUSINESSES WERE ANTICIPATING 2025 WOULD BE A DIFFICULT YEAR – AND THIS HAS PROVEN TRUE"

Pascal Parant, group chief commercial and marketing officer, Vallair

After a year of navigating supply chain bottlenecks, staff shortages and pricing pressures, the global MRO sector is entering 2026 with cautious optimism.

Industry leaders across OEMs, service providers and consultancies agree that next year is poised to be better than 2025. It should deliver growth opportunities and deeper customer engagement.

IBA's Ray says airlines have reported better availability (reduction in the average number of AOGs at any one time) of new-tech narrowbody aircraft during H2 2025, "a clear indication that engine MROs and additional capacity have reduced AOGs... although there is some way to go". He also says that inventory bottlenecks in the supply chain "have generally improved".

Fleet renewal and aircraft production acceleration are central to hopes for 2026. "As manufacturers ramp up production to address delivery backlogs and support fleet renewal, demand for



Pascal Parant, group chief commercial and marketing officer, Vallair

maintenance will continue to grow," says ST Engineering's Lam. He emphasises that growth will be shaped by "ongoing trends in supply chain availability, fleet utilisation, technology adoption, and the labour market".

Airbus has the same sentiment, noting that "the dynamic of investments and increasing capacity for maintenance operations which started in 2025 will continue in 2026." Airbus's spokesperson adds that traffic growth and fleet expansion will sustain demand, while digitalisation will "soften the supply chain difficulties and workforce scarcity that will not be entirely fixed".

To meet rising demand, MRO providers will have to double down on technology and workforce development. For example, ST Engineering is deploying smart MRO technologies, from predictive analytics for parts planning to AI-powered engine health monitoring. These tools can enhance productivity and customer support, while partnerships with educational institutions aim to build skilled capacity.

Stewart sees AI as an underutilised game-changer. He says: "AI is showing increasing evidence of having a material impact on productivity in airline technical operations, particularly when applied to the right use cases." He also flags the training supply chain as both a challenge and an opportunity, urging innovation in recruitment and incentives.





▲ Aircraft painting taking place at MAAS Aviation

Footprint gains in the shadow of supply chain woes

Embraer is leveraging its current momentum across commercial, executive and defence aviation to expand its MRO footprint. “In 2026, we aim to keep expanding our MRO network worldwide to provide more capacity and capability, and add value for our commercial and executive jets customers,” says Stevens.

Lufthansa Technik is also investing heavily, despite 2025 having “more challenges than expected” and affecting profitability. “Our growing sales show that customers are counting on us... and this gives us confidence,” says Lagemann. He highlights new sites in Portugal and Canada, as well as the modernisation of its Hamburg headquarters, as healthy signs in the MRO market.

Stewart emphasises the need to “enhance supply chain transparency and collaboration across the entire value chain,” and points to aftermarket partnerships and consolidation as key levers.

IBA’s Ray notes that engine OEMs must “continue sourcing additional capacity, whether organically or through

licensing.” He adds that if narrowbody engine OEMs can deliver reliable new tech, it could “prompt retirements thereafter improving supplies of USM for more affordable MRO solutions”.

At Ametek MRO, Bouissou also sees opportunity in legacy support. “The offloading of older repair programmes to third parties is likely to continue as OEMs re-centre their activities on newer, higher margin products,” he says. He stresses the importance of support agreements with OEMs, especially as software and documentation controls tighten.

Lease transitions, consolidation, and regional diversification

Lease transitions, a key revenue stream for many MROs, are expected to rebound.

Vallair’s Parant says: “Aircraft that have been in extended service will come due for maintenance, and the heavy season will have exhausted many assets requiring checks.” He notes that major operators have already secured winter slot capacity and that “new entrants are reaching out for support”, a reversal from the uncertainty of late 2024.



Jeffrey Lam, president of commercial aerospace, ST Engineering

However, Marston cautions that lease transitions may remain at 2024/2025 levels until 2027, suggesting that “market consolidation/partnerships” will be necessary to manage overcapacity and labour challenges.

At Oliver Wyman, Stewart anticipates consolidation across fragmented MRO segments such as distribution, component repair and end-of-life material solutions. “Aftermarket partnerships are expected to increase repair and pooling opportunities, helping to counteract poor parts availability and high prices,” he says. He believes a geographic shift might also be in the offing: “Ongoing economic and geopolitical instability is driving airlines to find suppliers closer to their operations, or in less volatile regions.”

This might open doors for trusted regional MROs to expand capacity or deepen service offerings. It will also encourage further expansion from major players such as Embraer whose services and support division recorded its highest ever backlog – US\$4.9 billion in Q2 2025, a 55% increase compared to Q2 2024. “We view 2025 as a stronger year in terms of strategic delivery, and we remain focused on building future momentum,” Stevens says.

It appears that 2026 will be defined by agility, scale and strategic opportunity. Whether through AI adoption, global expansion, supply chain recalibration or customer-centric service models, MRO providers are preparing to meet rising demand with smarter, more resilient operations.

As Bouissou concludes: “This environment will offer growing opportunities to players able to respond to these trends... while retaining their agility and capacity to respond to increasing customer expectations.” ●

“THE INDUSTRY IS SEEING ADVANCES IN DIGITALISATION, AUTOMATION AND AI-DRIVEN PROCESSES, WHICH ARE HELPING TO ENHANCE EFFICIENCY, REDUCE DOWNTIME AND IMPROVE RELIABILITY”

Jeffrey Lam, president of commercial aerospace, ST Engineering



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APAC's MRO shift

As APAC fleets expand and pressures rise, FL Technics Indonesia's **Martynas Grigas** shares where capability gaps, investment priorities and operational shifts are emerging



“The most valuable asset for our customers has been our new Bali hangar and the range of capabilities it supports”



MARTYNAS GRIGAS

chief executive of FL Technics
Indonesia and Avia Management
Group Asia (AMGA)

▶ **With APAC fleets expanding and engine issues still dominating shop visits, what do you think is the single most overlooked capability MROs in the region will need to stay ahead of in 2026 and beyond?**

The most overlooked capability that MROs in the APAC region will need to stay ahead of in 2026 and beyond is the ability to quickly perform top-case engine maintenance and light-fix engine work on narrowbody fleets.

This capability directly supports the escalating demand for fast engine turnarounds and reduces the need for lengthy shop visits. A top-case engine maintenance shop is already in our development plans to begin operations in 2027.

As engine turnaround times (TATs) remain under pressure globally, the region increasingly requires localised, short-cycle recovery options that prevent unnecessary shop inductions.

Airlines need MROs that can diagnose, stabilise and return engines to service within very tight operational windows, particularly as LEAP and PW1100G issues continue to shape the narrowbody environment.

Many operators still depend on overseas facilities for these repairs, adding avoidable logistics delays and unnecessary downtime.

Building this capability within APAC will have a direct impact on fleet availability and operational resilience, giving regional MROs a distinct competitive advantage as the narrowbody fleet continues to expand through 2030.

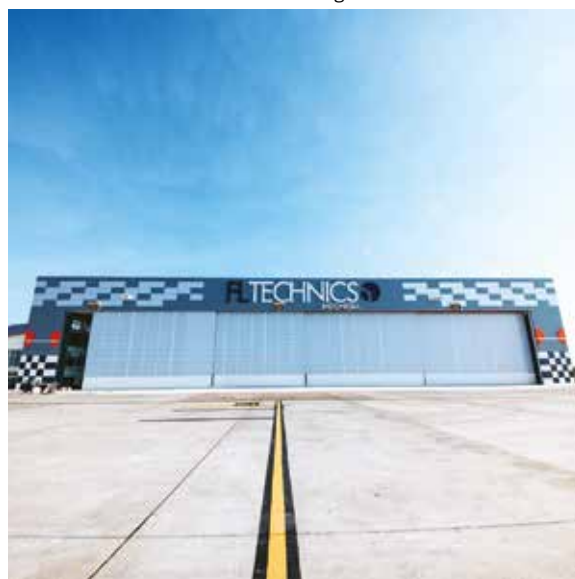
▶ **FL Technics Indonesia has added new capabilities, including B737 MAX component repairs, but what recent capability or asset has delivered the most unexpected value to customers so far?**

The most valuable asset for our customers has been our new Bali hangar and the range of capabilities it supports.

While B737 MAX and A320neo component repair approvals captured attention, airlines have consistently found that the state-of-the-art Bali hangar delivers the greatest practical value.

Predictable slot access, an efficient induction process, and an advantageous location have become more important to operators than any single new approval.

▼ FL Technics Indonesia's new Bali hangar





▲ FL Technics Indonesia is an FAA Part-145 certified aircraft maintenance organisation

“The region has undergone a significant step-change in infrastructure, capabilities and workforce maturity”

Many airlines – particularly ACMI and leisure carriers – use Bali as a stable, uncongested point for scheduled checks, reducing ferry time and avoiding operational disruption.

The hangar’s design, including docking systems, tool layout and workflow organisation, enables our teams to maintain consistent TATs even during peak periods.

Several operators also report value from the ability to align crew rotations with maintenance events in Bali. These everyday operational efficiencies were not initially highlighted but have quickly become decisive factors for customers.

► **Southeast Asian operators are pushing for faster turnarounds. Where do you see the biggest untapped efficiency gains are; in technology, processes, or people?**

All these aspects are very important in the base maintenance process, but I believe people remain the primary asset.

With strong training programmes, disciplined processes, and a robust support framework, personnel can deliver outstanding results.

At the same time, the supply chain demands additional attention in order to stay within agreed TATs.

Even with sophisticated digital planning tools, TAT performance still depends on how effectively teams coordinate findings, allocate tasks and manage the critical path. Clear shift-lead oversight, structured cross-training and stronger task ownership help eliminate delays that occur during complex checks.

Material readiness continues to be a universal challenge across global MRO operations and affects operators throughout APAC.

However, by combining well-trained teams, efficient processes and more proactive material management, Southeast Asian MROs can fully leverage their strengths and consistently meet the rising turnaround expectations of both regional and international airlines.

► **If you could change one misconception that airlines have about the current APAC MRO landscape, what would it be?**

The APAC region is growing rapidly across the aviation sector and especially within base maintenance activity, and new players entering the market bring substantial know-how and experience that are elevating quality and service levels dramatically.

People in Indonesia, for example, are highly skilled, motivated and eager

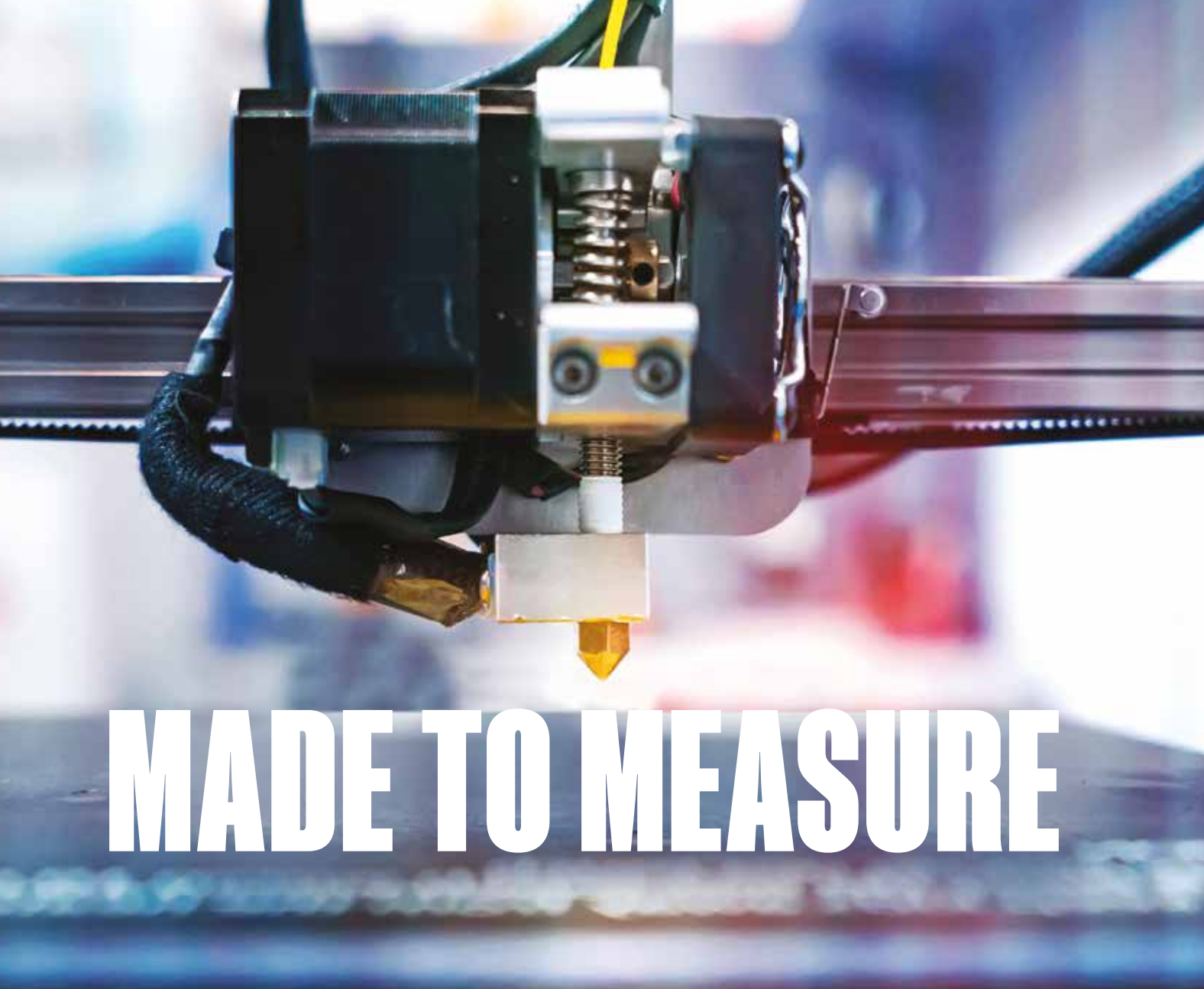
to continue developing. This strong manpower capability, combined with FL Technics’ ongoing investments, is helping Indonesia to evolve into a major maintenance hub.

The misconception that APAC MROs compete primarily on cost is increasingly outdated. The region has undergone a significant step-change in infrastructure, capabilities and workforce maturity, driven by global players investing heavily in tooling, training, and new-generation approvals.

Indonesia is no longer simply a capacity market – the technical quality and consistency delivered by local teams now matches that of more established MRO centres.

► **Looking ahead, which emerging trend in the region do you think will have the most disruptive impact on maintenance strategies?**

At the moment it’s the supply chain, which remains very fragile both regionally and globally, but moving forward we are seeing new generation fleets arriving rapidly in the region. And with the volume of aircraft orders coming into Asia, I believe this will become the main focus in the near future. ●



MADE TO MEASURE

Mario Pierobon explores why additive manufacturing (AM) is becoming a mainstream production method for maintenance providers

Additive manufacturing (AM) is providing efficiencies in aviation MRO operations. Once viewed as a niche technology for prototyping, it has now become a practical tool for producing certified aircraft components ranging from simple cabin fittings to more complex structural parts.

MRO organisations are increasingly exploring its potential to improve supply chain resilience and enable faster, localised production, while navigating the evolving regulatory landscape that governs airworthiness and safety.

AM-produced parts

Lufthansa Technik's AM centre in Hamburg has gained experience with the first load-bearing metal parts for use outside the cabin, and is currently focusing on a broad range of components, usually made of polymer plastic, for widespread use in aircraft interiors, according to company spokesperson Michael Lagemann.

"These range from parts hidden in the background, which passengers rarely, if at all, come into contact with, to much more 'visible' components such as seat covers or 'occupied' signs for restrooms."

Lagemann adds: "We have also already 3D-printed special holders for pilots' headsets, and we regularly design and produce a wide range of 'little helpers', namely intelligent tools for maintenance tasks or workshops. These devices or equipment can enable, or at least significantly simplify, the repair and replacement of certain aircraft or cabin parts.

"One example is a solution that allows our mechanics to replace onboard water filters without having to remove the entire assembly, which is very time-consuming."

“AS AM GAINS MATURITY, ITS ROLE WITHIN AIRCRAFT MRO CONTINUES TO EVOLVE FROM EXPERIMENTATION TO MORE COMMON PRACTICE”

Aircraft MRO organisations typically begin their AM journey with polymer cabin interior components, as these are frequently replaced due to wear and tear, are often expensive and can have long lead times, yet are relatively easy to certify due to their low criticality, according to Stephan Keil, business owner aviation and certification at EOS. “Obsolescence and supply chain challenges cause long lead times, while the cost of conventional injection moulding tools translates into high prices for small runs and high minimum order quantities, which means capital tied up in inventory,” he says.

Keil adds: “Experienced MROs also use AM to manufacture components for aircraft cabin systems, such as air distribution, restroom systems, passenger service units (suspended elements such as signage, air vents and speakers), seat actuators, and cabin structures.”

There are three main motivations driving Lufthansa Technik to use additive manufacturing, explains Lagemann. “First, the technology offers a much more direct path to producing complex geometries, for which conventional manufacturing methods would often require special

tooling or moulds, which would have to be designed and manufactured before actual production begins,” he explains.

“This is no longer necessary with an AM component, which can usually be printed immediately and is often much more lightweight, with less waste and greater cost efficiency.”

Lagemann continues: “Second, by considering AM’s superior customisation capabilities and design flexibility from the outset, and perhaps a little creative inspiration drawn from nature or other intelligent sources, we could also significantly optimise the geometries of our components to make them lighter, stronger, and sometimes even a little cheaper, without compromising stability, durability or safety.”

The third key factor for AM components is the enormous potential to increase the resilience of the aviation industry’s supply and logistics chains, affirms Lagemann. “Instead of sending a cabin component from Hamburg to a facility abroad, we could transfer the data much more easily and have local



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“GENERALLY, ALL EASA REGULATIONS MUST ALSO BE CONSIDERED FOR AM COMPONENTS”

colleagues print the required component themselves,” he explains.

Lagemann continues: “Even if local printing takes a few hours, it is still a faster logistics process than the conventional intercontinental component shipping. In extreme cases, the turnaround time of an aircraft layover depends on the availability of a specific component. In this instance, a locally printed part could be a real lifesaver. While the supply chain advantages have likely been known for decades, they have become even more relevant and interesting in the recent tariff debate.”

Regulatory pathways

Each aircraft component design must originate from an approved aircraft design organisation (DO), while component production must be carried out by an approved aircraft production organisation (PO).

The DO assumes responsibility for component design, as demonstrated by prototype testing, while the PO assumes

responsibility for component quality assurance, as demonstrated by qualifying the processes and materials of its AM machines, explains Keil. “The DO must be authorised to design AM components, while the PO must be authorised to manufacture using AM technology, both approved by the respective competent authority,” he says.

Keil adds: “Both organisations must apply for AM to be included in their scope of work, and they must be approved by the respective competent authority. Part designs can be certified by the DO of the OEM which is holding the aircraft type certificate (TC holder) or by independent design organisations – approved under the same regulatory framework.”

Generally, all EASA regulations must also be considered for AM components, Lagemann observes: “Continuous traceability is mandatory and must cover the entire production chain, from raw material acquisition to final installation and operation on board the aircraft.

“Obtaining regulatory approval for AM components, however, requires even more effort and testing than for components manufactured using conventional methods.”

Independent design organisations in Europe are required to mark their components with the words the ‘EPA – European Part Approval’, while non-OEM design organisations based in the US will mark them with the words ‘PMA – Part Manufacturer Approval’ to identify that the components originate from a different design body than the OEM, as Keil explains. “Other countries have equivalent marking requirements. In this context, it is important to note that EPA and PMA components are certified under the same regulations and regulatory oversight as OEM components.”

To conclude

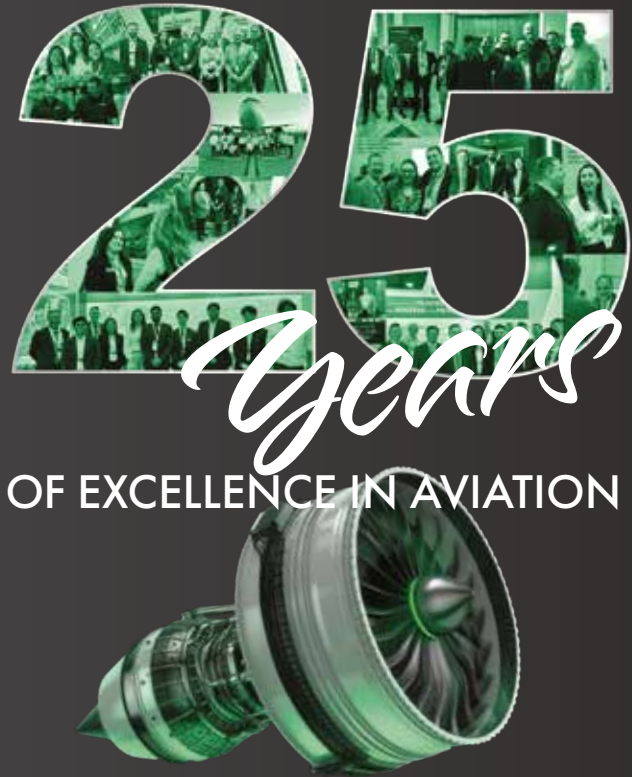
As AM gains maturity, its role within aircraft MRO continues to evolve from experimentation to more common practice. The technology’s flexibility, efficiency and customisation potential make it an attractive option for both established and emerging maintenance providers and a useful contribution to manage supply chain disruptions. ●



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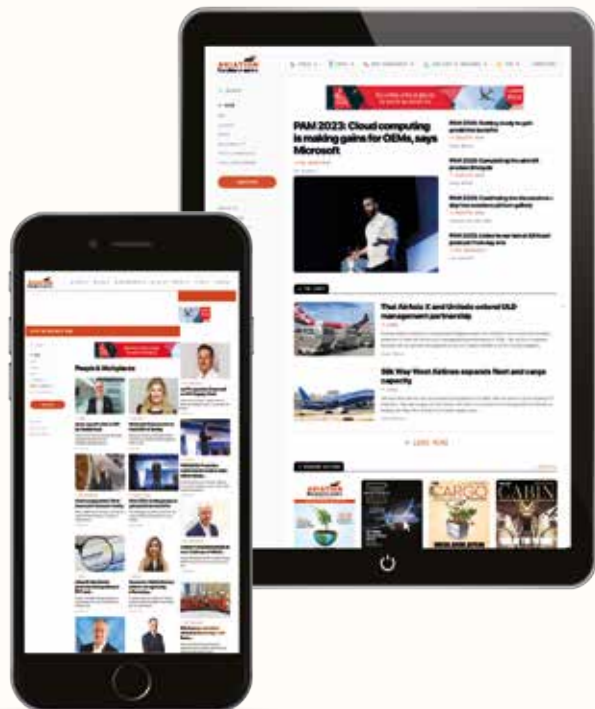
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MRO EUROPE 2025 ROUND-UP

MRO Europe took place in October in London. Here's a round-up of just some of the news announcements to come from the event

DIGITALISATION

Korean Air to upgrade its predictive maintenance solution

Korean Air signed an agreement to adopt Airbus' Skywise Fleet Performance+ (S.FP+), an upgraded predictive maintenance platform that replaces its existing SPM+ and SHM systems.

The move is a strategic step to unify maintenance processes ahead of the airline's integration with Asiana Airlines and its expanding fleet.

S.FP+ uses advanced analytics to identify component issues before they occur, enhancing aircraft availability and reliability.

Korean Air selected the 'Control' tier, which includes pre-departure check support and NLP-powered troubleshooting, helping to reduce AOG events and costs.

The solution will cover Korean Air's A321neo, A330, A350 and A380 fleets, with Asiana to follow.

HEAVY MAINTENANCE

Joramco and MNG extend MRO partnership

Joramco and MNG Airlines signed a new agreement to continue carrying out C-checks on the Turkish cargo carrier's Airbus A330.



2

DAE Engineering's Fraser Currie said: "Our continued partnership with MNG Airlines reflects the confidence our clients place in Joramco. We are committed to delivering world-class MRO services and to deepening this collaboration as we grow together."

MNG Airlines' Mehmet Eyigurbuz said: "We highly value our longstanding partnership with Joramco, which has consistently demonstrated professionalism and technical excellence."

"This extension marks another important step in strengthening our collaboration, ensuring the highest standards of safety and reliability for our fleet."

ENGINE MRO

AFI KLM E&M and SunExpress agree six-year engine MRO deal

Air France Industries KLM Engineering & Maintenance (AFI KLM E&M) and SunExpress signed a new, long-term

agreement for the maintenance of CFM56-7B engines.

The contract marks a new chapter in the partnership between the two companies and will span from 2025 through 2031.

Under the terms of the agreement, AFI KLM E&M will provide comprehensive shop visit support services for the CFM56-7Bs powering SunExpress' fleet of Boeing 737 Next Generation aircraft.

Founded in Antalya as a joint venture between Turkish Airlines and Lufthansa, SunExpress operates flights to 237 routes across 35 countries, carrying nearly 15 million passengers annually.

The airline has ambitious expansion plans, with its fleet projected to grow to 166 aircraft by 2035.

SunExpress' Cemil Sayar said: "As our fleet continues to grow, it is critical to work with partners who understand our evolving operational needs."



1

Christian Patent/Adobe Stock



3

Martijn de Vries from KLM Engine Services said: “We are committed to delivering efficient, high-performance engine solutions that support SunExpress in maintaining its excellent operational standards.”

SUPPLY CHAINS

Caerdav announces new consignment agreement with Aerospheres

Independent UK MRO, Caerdav, entered into a comprehensive new consignment agreement with MRO supplier Aerospheres in a move designed to streamline the acquisition and supply of important maintenance stock.

The new deal will see the company maintain stock levels across a wide range of materials, including tapes, oils, sealants, adhesives, composites and more, at its St Athan facility.

Caerdav says the agreement underlines the progressive steps both companies are taking to support their continued growth strategies.

Caerdav’s Chris Coleman said: “As we begin to consistently fill our recently launched fourth line, we need to ensure we have access to the materials



4

“SunExpress has ambitious expansion plans, with its fleet projected to grow to 166 aircraft by 2035”

needed to support the wide range of maintenance solutions we deliver to our customers.

“What sets Aerospheres apart is the work the team has done to understand our business, offering us a flexible solution that will help to avoid potential supply chain issues, allowing us to consistently reach the level of service our expanding customer base expects.”

Caerdav says that key to the deal is Aerospheres’ ability to consolidate a process formerly managed through multiple suppliers, helping to improve efficiency by streamlining the time taken to source and order spares.

HEAVY MAINTENANCE

mas selects Joramco for A330 fleet MRO

Joramco has signed a maintenance agreement with Mexican cargo airline, mas, to carry out heavy base maintenance checks on mas’ A330 fleet, with services set to start from December 2025 onwards.

DAE Engineering’s Fraser Currie said: “We are pleased to welcome mas at Joramco as our latest partner. This agreement reaffirms Joramco’s position as a trusted MRO provider of choice for leasing companies, operators and airlines worldwide.”

mas’ Andrés Fabre said: “We are delighted to partner with Joramco as we continue to expand and strengthen our operations.

“Their proven technical expertise and commitment to excellence make them an ideal partner to support the maintenance of our A330 fleet, ensuring the highest levels of safety, reliability and performance for our customers.”

APU MRO

Norse Atlantic and EPCOR sign APS5000 support deal

EPCOR BV, the Air France Industries KLM Engineering & Maintenance (AFI KLM E&M) centre of excellence for the repair of APUs and components, and Norse Atlantic Airways signed a long-term comprehensive repair and maintenance agreement for the Norwegian low-cost long-haul airline’s fleet of 12 Boeing 787 Dreamliners powered by the APS5000 APU.

1. Korean Air signs to upgrade its Airbus predictive maintenance solution
2. Joramco and MNG extend MRO partnership
3. SunExpress Boeing 737-800
4. mas selects Joramco for A330 fleet MRO
5. Caerdav agrees new consignment agreement with Aerospheres

5



Jerry/Adobe Stock

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The agreement marks the first collaboration between the two firms and by leveraging EPCOR's extensive experience and technical expertise, Norse Atlantic Airways will benefit from enhanced operational reliability, minimised aircraft downtime, and greater predictability in maintenance costs.

Ahmad Abu Nima from Norse Atlantic Airways said: "EPCOR's proven capabilities, commitment to quality and experience with the APS5000 give us confidence as we expand our network and fleet."

"Our collaboration will help ensure that our Boeing 787 Dreamliners operate at peak performance, supporting our promise of affordable and environmentally conscious travel."



2

Sustainability also plays a key role in the partnership; by maximising the lifespan of critical components and reducing waste, the agreement contributes directly to Norse Atlantic Airways' environmental objectives and ongoing efforts to promote greener aviation and set new standards for environmental stewardship among low-cost carriers.

COMPONENT SUPPORT

Corendon Airlines extends component pool agreement with Turkish Technic

Turkish Technic extended its component pool agreement with Corendon Airlines which was originally signed in 2019.

The extended agreement is for another five years and covers Corendon Airlines' Boeing 737MAX and Boeing 737NG fleet.

The agreement will enable the airline to benefit from Turkish Technic's extensive component inventory, highly skilled workforce and expertise in component maintenance.

HEAVY MAINTENANCE

Joramco to maintain World Star Aviation aircraft

Joramco signed a maintenance agreement with full-service aircraft and engine lessor World Star Aviation, to carry out heavy base maintenance on various aircraft.



Luthansa Technik

3

The agreement primarily covers Boeing B737-800Fs, and the scope of work includes C-checks, painting, lease transition, and re-delivery services, with the project scheduled to run over a 10-week period.

DAE Engineering's Fraser Currie said: "It is a great pleasure to work with World Star Aviation and welcome them as one of Joramco's newest partners."

"This agreement reflects the confidence that leading lessors place in our technical capabilities, skilled workforce, and commitment to delivering high-quality maintenance solutions on time and to the highest standards of safety."

1. Norse Atlantic Airways 787 Dreamliner
2. Corendon Airlines extends component pool agreement with Turkish Technic
3. Representatives of Lufthansa Technik and Chromalloy at MRO Europe
4. World Star Aviation leases aircraft to SolitAir
5. Joramco and TUI Group agree E190-E2 MRO deal
6. easyJet extends long-term base maintenance work to Lufthansa Technik

easyJet's Brendan McConnellogue said: "The easyJet and Lufthansa Technik Sofia teams work brilliantly together each winter season to meet the airline's ever-growing needs. We are extremely pleased to be extending our relationship as our fleet continues to grow."

HEAVY MAINTENANCE

Joramco and TUI Group agree E190-E2 MRO deal

Joramco has extended its MRO agreement with TUI Group, expanding a partnership that previously covered base maintenance for the airline's Boeing 787 fleet.

Under the new deal, Joramco will, for the first time, take on maintenance work for TUI's Embraer E190-E2 aircraft alongside its existing commitments.

DAE Engineering's Fraser Currie said: "This agreement marks another milestone in our relationship with TUI Group. At Joramco, we take pride in being the trusted MRO provider for our partners, and we are committed to furthering this collaboration in the future." ●



6

"The agreement contributes directly to Norse Atlantic Airways' ongoing efforts to promote greener aviation"

ENGINE COMPONENTS

Lufthansa Technik and Chromalloy launch first PMA blades for V2500 SelectOne

Lufthansa Technik and Chromalloy have introduced the first FAA-approved PMA turbine and compressor blades for the V2500 SelectOne engine, offering operators a new cost-saving alternative to OEM components.

The second-stage HPT and seventh-stage HPC blades are already in service across multiple Lufthansa Group A321ceo engines, with a double-digit number of installations accumulating around 1,800 flight hours and 1,100 cycles.

Lufthansa Technik will now offer the certified PMA parts as an option during V2500 SelectOne overhauls, marking

a key expansion of its long-standing partnership with Chromalloy, which has been extended to 2035 to support further PMA development.

HEAVY MAINTENANCE

easyJet extends long-term base maintenance work to Lufthansa Technik

Lufthansa Technik and easyJet agreed to significantly extend their successful cooperation in the field of aircraft maintenance services for the low-cost airline's fleet of A320 family jets.

For the next seven years, Lufthansa Technik Sofia is set to continue its role as a mainstay for easyJet's regular heavy base maintenance checks.

Each winter season, Lufthansa Technik's Southeastern European powerhouse will dedicate four parallel overhaul bays exclusively to the airline.

The agreement covers A320ceo and A320neo family aircraft operated under the various Air Operator Certificates (AOCs) of easyJet – easyJet UK, easyJet Switzerland and easyJet Europe – and ideally complements the recurring light base maintenance checks that the airline's fleet already receives at Lufthansa Technik Milan.



4



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AIRCRAFT CONVERSION: A CATALYST FOR GLOBAL TRADE VALUE

Through P2F conversions, IAI is enabling operators to expand capacity cost-effectively, extend aircraft lifespans, and maintain vital trade flows linking the world's economies

Air cargo plays a pivotal role in today's interconnected global economy, driving trade value far beyond its modest share of physical volume. According to IATA research, while air freight accounts for less than 1% of global trade by volume, it represents an astonishing 33% of total worldwide trade value. This figure highlights how essential air cargo is to modern commerce, enabling the rapid movement of high-value goods across continents and ensuring that global supply chains remain efficient and resilient.

Each year, air cargo transports goods worth more than USD \$8 trillion across over 60,000 trade lanes and through 3,200 airports worldwide. The global economy, with its increasing dependence on e-commerce, advanced manufacturing and time-sensitive logistics, depends heavily on these networks. In response to this ever-rising demand, forecasts show that the global freighter fleet will expand dramatically over the next two decades – by nearly 70% – growing from about 1,770 to more than 3,000 aircraft.

A changing landscape

Despite this promising projection, aircraft manufacturers face substantial challenges in meeting current and future market demands. Production bottlenecks, high development costs and extended delivery timelines make it difficult to keep pace with the surging need for cargo aircraft.

The industry's two major players, Airbus and Boeing, are planning to introduce new widebody freighter models, the Airbus A350F and the Boeing B777-8F, toward the end of the decade. While these new platforms

will play a key role in the long term, the immediate and growing demand for cargo capacity requires faster, more cost-effective solutions.

This growing gap between market needs and new aircraft supply opens the door for a transformative solution: passenger-to-freighter (P2F) aircraft conversions.

Pioneer in mid-size conversion

IAI (Israel Aerospace Industries) has long been a pioneer in this field and is strategically positioned to address the industry's evolving requirements.

Over the past decade, IAI has become a global leader in P2F conversion programmes, particularly within the medium-sized aircraft segment. The company has delivered more than 300 converted cargo aircraft, securing a commanding 60% market share in this category through its B767-200 and B767-300 conversion programmes.

IAI's leadership in the medium-size freighter market is not only a measure of its engineering excellence but also a testament to its broader economic contribution. By converting passenger aircraft into efficient, reliable cargo carriers, IAI directly supports global trade, enabling operators to meet growing logistics demands while keeping costs manageable. Every aircraft conversion represents more than an engineering project – it's a vital link in the chain of global commerce, ensuring that critical goods reach markets swiftly and affordably.

Strategic positioning

Recognising the shifting dynamics of global trade and the increasing need for larger, more efficient freighters, IAI has



strategically expanded its portfolio. The company's next-generation programmes, the B777-300ERSF and A330BDSF conversions, are designed to meet the evolving requirements of both the mid-size and widebody cargo segments.

The B777-300ERSF, known in the industry as 'The Big Twin', is widely regarded as a game changer. It combines the payload and range capabilities of a dedicated widebody freighter with the economic benefits of a converted passenger jet.

IAI has established a global infrastructure of conversion centres to support this programme, ensuring rapid delivery and widespread service coverage. This strategic network is key to meeting the aviation industry's increasing demand for widebody cargo capacity.

The 777-300ERSF delivers a high-quality solution at roughly one-third of the cost of a new-build freighter, making it an exceptionally attractive option for operators looking to expand their fleets efficiently.



IAI
2

“IAI’s conversions ensure that the flow of goods continues smoothly even amid global supply-chain pressures”

For the medium-sized segment, IAI’s A330-300BDSF conversion programme extends the company’s dominance by addressing a critical market need – the shortage of B767-300 airframes available for conversion. The A330-300BDSF provides operators with a modern, fuel-efficient, eco-friendly alternative that ensures the continued availability of mid-size freighter capacity.

Economic impact

The benefits of IAI’s aircraft conversion programmes extend far beyond the aviation sector. By offering cost-effective cargo solutions optimised for real-world operational needs, these programmes help airlines and logistics companies maintain competitive transportation costs relative to the value of their goods. This cost balance is essential to preserving viable trade routes, especially for high-value and time-sensitive products such as electronics, pharmaceuticals and perishable goods.

Without affordable conversion options, the rising cost of new-build aircraft could make certain trade lanes economically unfeasible, particularly for smaller operators. By providing

efficient and flexible cargo capacity, IAI’s conversions ensure that the flow of goods continues smoothly even amid global supply-chain pressures.

Supporting global trade

IAI’s sustained leadership in medium-size conversions underscores its critical role in the global logistics ecosystem. These aircraft not only link major economic centres but also support emerging markets by enabling reliable, cost-effective air transport. As trade networks grow increasingly complex, converted aircraft provide the flexibility to adapt capacity to shifting demand patterns, whether driven by seasonal fluctuations, geopolitical changes, or the rapid expansion of e-commerce.

Furthermore, by extending the operational life of existing passenger aircraft, IAI’s conversion programmes contribute to sustainability goals. Repurposing aircraft reduces the need for new manufacturing and helps lower the aviation industry’s overall carbon footprint. For operators, this translates into both economic and environmental efficiency, a win-win scenario that aligns with the industry’s broader push toward greener logistics solutions.

Driving the future

As global trade continues to evolve, the importance of reliable, adaptable cargo capacity will only increase. The surge in online retail, the growing expectation for fast international deliveries, and the demand for resilient supply chains all point to the same conclusion: efficient air cargo is indispensable.

IAI’s aircraft conversion programmes are positioned at the heart of this transformation. By combining advanced engineering with strategic foresight, the company ensures that airlines, cargo operators and global logistics providers have the tools they need to meet tomorrow’s challenges.

Ultimately, IAI’s work does more than convert aircraft – it helps sustain the flow of goods, opportunities and economic growth across the world.

Through innovation, precision and strategic vision, IAI continues to play a defining role in maintaining the strength and sustainability of global trade value. ●

1. A converted B777-300ERSF freighter for Kalitta Air
2. The interior of a converted B777-300ERSF



PROMOTING THE OVERHAUL PREMIUM

Repairing components rather than buying brand new replacements is one of the ways that carriers can keep costs down in a tough airline market, as **Bernie Baldwin** reports

Whether an airline operates a low-cost business model or a full-service model with an array of premium elements, not a single one – without exception – wants to spend more money than it has to in order to deliver its service.

Aircraft maintenance is one of the top five cost centres for an airline, so anything that can alleviate expenditures is highly valued.

Within MRO costs, one area which offers considerable potential is the effective repair and overhaul of components rather than paying for more expensive replacements.

Changes in demand

EirTrade Aviation repairs executive Stephen Dixon has been observing the changes in demand for component repair work. “It has increased substantially over the past couple of years,” he declares. “The desire for travel is at an all-time high and in regions such as North America and Europe, travel demand begun to exceed pre-pandemic levels. As for developing nations in Africa and Asia, demand is rapidly increasing and EirTrade Aviation is seeing signs that this will soon be comparable with North America and Europe.”

“AIRCRAFT MAINTENANCE IS ONE OF THE TOP FIVE COST CENTRES FOR AN AIRLINE, SO ANYTHING THAT CAN ALLEVIATE EXPENDITURES IS HIGHLY VALUED”

When you pair this dynamic with NextGen aircraft/engines (neo/MAX, LEAP/GTF), where maintenance is required earlier than projected, a situation is created where maintenance requirements outpace available MRO capacities – a perfect storm!”

Witte continues: “Post-pandemic, we have seen a push from OEMs, operators and others to invest in MRO capability/capacity expansion in regions of the world where capacity was noticeably lacking during Covid. Efforts to ‘regionalise’ these efforts have been reinforced with the current geopolitical environment. MRO infrastructure is being built in regions such as India, the Middle East and China, to address the large portion of new aircraft in these markets that will require MRO services in years to come.

“By type, we continue to see narrowbody MRO requirements leading the pack. Whether it’s airframe, engine or component maintenance, the aging narrowbody fleet in operation continues to lead the total population and spend in the MRO sector,” Witte reports.

Peter van Helden, senior vice president component product at AFI KLM E&M, sees air traffic growth in the APAC and Middle East regions causing a growing demand for component repairs on a flight hour-based type of agreement. “Additionally, the postponed maintenance from Covid, in combination with global supply chain challenges and well-known engine issues, is keeping a high demand on component MRO,” he comments.

“In North America and Europe, demand remains steady, with newer aircraft and engine types such as the A320neo, A350, 737 MAX and 787, increasing their market share. Nevertheless, due to the aforementioned issue, the current aircraft types keep flying more than expected and are keeping MRO demand stable,” van Helden emphasises.

Since early 2022, Aviation Technical Services (ATS) has seen demand for component repairs increase steadily especially in North America, APAC and Latin America, according

15%

Annual aircraft flight hours across the global commercial fleet increased by 15% from 2022 through 2024 – from 2,400 hr to 2,800 hr

Dixon adds: “These factors contribute directly to the increased need for component repairs on both aircraft and engine parts, affecting all model types. The component repair industry is busier than ever and shows no signs of slowing down, which is a great challenge to be embraced.”

Brandon Witte, general manager of component services at AAR’s Grand Prairie facility, agrees about the uptick in component MRO demand, noting also that passenger travel has returned to, and in some sectors surpassed, pre-pandemic levels.

“This uptick in passenger demand, paired with a historically high backlog of new aircraft to be delivered, has delayed the retirement of aging aircraft and engines, causing older equipment to be utilised more than ever,” Witte says. “Annual aircraft flight hours across the global commercial fleet increased by 15% from 2022 through 2024 – from 2,400 hr to 2,800 hr. The longer aircraft and engines fly, the more maintenance is required.

1. Collins Aerospace is improving sales and inventory planning and management to continue to deliver on-time repairs



◀ AAR offers component MRO on structural, engine and airframe components



▲ Peter van Helden, senior vice president component product, AFI KLM E&M

to Dennis Santare, the company's senior vice president component and engineering solutions. "This increase has been felt across our structures, composites, accessories and machining product lines with our engine mount, flight control surfaces and fluid dynamics product lines enjoying the most significant growth," he confirms. "We had been seeing an uptick in demand from Europe, but the tariff question is currently weighing on that demand a bit."

Ryan Hudson, vice president and general manager of aftermarket for Collins Aerospace, notes that between 2021 and 2024, the company saw 17% growth in total repairs across regions. "Similar growth has continued in 2025," he states.

Even though growth is reported in just about every market, challenges remain, but alongside them are opportunities for those providing component MRO. "Several of our suppliers have experienced part delivery challenges which have impacted MRO turnaround times (TATs) and,

consequently, inventory," says Hudson. "We have several supply chain strategies in place, including designated engineering representative (DER) repairs, and we are improving sales and inventory planning and management to continue to deliver on-time repairs. We continue to work with our supply chain partners to increase the flow of critical material to ramp up MRO output."

Skilled technical availability

EirTrade Aviation's Dixon recalls that during the Covid period, the component MRO sector lost a significant number of experienced staff due to early retirement or change of sector. He notes: "The recovery from this drain of knowledge is taking longer than expected, resulting in supply chain issues and continuing staff shortages.

"Additionally, the war in Ukraine and subsequent trade restrictions with Russia are still impacting the supply chain of raw materials. Also, the industry is adapting to the introduction and MRO of newer aircraft and engine types, which takes up considerable resources, while the volume of the traditional MRO workload is only reducing slightly. All the above have resulted in longer TATs and higher MRO costs."

AAR's Witte believes that big challenges also create big opportunities, pointing to capacity constraints and material availability as the current common challenges. "Capacity constraints are due to an industry-wide lack of skilled labour to support the uptick in MRO demand," he explains. "The more recent generations entering the workforce have fewer participants pursuing technical, hands-on jobs than generations further back. Coupled with the accelerated retirement of the Baby Boomer generation during Covid, this creates a state where maintenance demand outpaces skilled technical availability."

"THE POSTPONED MAINTENANCE FROM COVID, IN COMBINATION WITH GLOBAL SUPPLY CHAIN CHALLENGES AND WELL-KNOWN ENGINE ISSUES, IS KEEPING A HIGH DEMAND ON COMPONENT MRO"

Peter van Helden, senior vice president component product, AFI KLM E&M

“THE COMPONENT REPAIR INDUSTRY IS BUSIER THAN EVER AND SHOWS NO SIGNS OF SLOWING DOWN, WHICH IS A GREAT CHALLENGE TO BE EMBRACED”

Stephen Dixon, repairs executive, EirTrade Aviation

Witte continues: “The opportunity here is centred around creating a consistent pipeline of technical, skilled labour. AAR has partnered with technical schools around the globe, local trade schools and military partners, supported educational advancement, and created programmes within our facilities to recruit, educate and advance team members.

“Material availability is a significant challenge that continues to drive maintenance delays and impacts costs across the entire value stream of the aftermarket. Supply chain challenges and limited capacity have left OEMs with the choice: do we support the production backlog of new NextGen aircraft/engines, or do we satisfy the post-production MRO requirements needed to return a legacy aircraft to operation? This dilemma, paired with a lack of used serviceable

material (USM) resulting from fewer aircraft/engines being parted out, has created a landscape where obtaining materials to support MRO services has expanded material lead times.”

Witte adds: “Achieving stability in the supply chain requires exploring all options, including partnerships with upstream material providers and using OEM alternatives, minor and DER repairs.”

According to Santare, ATS is meeting what he calls one of the biggest challenges to consistently plague the industry. “The issue of having enough mechanics and technicians to tackle the workload in a timely manner has lessened for us as we’ve progressed through 2025. We’re consistently delivering our services to customers with quicker turn times thanks in part to this, as well as in improvements in our operational performance and supply chain,” he confirms.



▲ Stephen Dixon, repairs executive, EirTrade Aviation

▼ AAR conducts MRO checks on more than 10,000 high-value components





◀ Aviation Technical Services (ATS) has seen demand for component repairs increase steadily especially in North America, APAC and Latin America



▲ Brandon Witte, general manager of component services, AAR

Santare adds: “Opportunities exist for companies such as ATS to provide customers with multiple options when solving for component needs. For example, while ATS is increasing its diligence on managing repair costs to drive lower beyond economic repair (BER) rates, if a part does go BER, we can offer a replacement through our Ranger Air USM business channel. Similarly, we can also offer PMA and DER solutions to avoid costs and dramatically reduce lead time on key piece parts.”

AFI KLM E&M’s van Helden returns to the major challenge of having sufficient skilled manpower. “To meet this, our global footprint of multiple MRO shops – be they 100% affiliates or joint ventures delivering our quality standards – along with our innovative training methods provides the potential to grow our business further,” he remarks. “Supply chain disruptions that keep affecting on-time delivery and shop performance are another challenge. Here lie the biggest opportunities to search proactively for solutions, such as the development of more and deeper repairs.”

Van Helden adds: “Furthermore, the use of alternatives such as USM, EASA Part 21J developed repairs or PMA parts also becomes necessary. Specifically, in the case of continuous non-performance of the OEM supply chain on specific parts, there should be more flexibility to lift OEM restrictions on the use of PMA parts as well as an appetite from the OEM for (joint) development and use of EASA Part 21J approved repairs to keep our customers’ aircraft flying.

“The final major challenge comes from the effect of those already mentioned – the ability to assess when repairs are needed in order to plan workforce, repairs and materials,” van Helden says. “The opportunity here is for developing and applying data-driven solutions such as PROGNOS to predict this better.”

Using new repair technologies

When it comes to new repairs in the market and what repair developments customers can expect in the next few years, van Helden points to the use of AI in optimising repairs and the isolation of faults. “There will also be more focus

“MATERIAL AVAILABILITY IS A SIGNIFICANT CHALLENGE THAT CONTINUES TO DRIVE MAINTENANCE DELAYS AND IMPACTS COSTS ACROSS THE ENTIRE VALUE STREAM OF THE AFTERMARKET”

Brandon Witte, general manager of component services, AAR



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on salvaging machined parts by using new repair technologies to counter supply chain issues on critical parts,” he adds.

Hudson reports that Collins Aerospace has a team dedicated to developing repairs for critical casting and housings to return them to customers with the same reliability and performance. “We also have several electronic product systems housing repairs (housing-casting) being evaluated. These repairs are in the early stages and will require approval prior to implementation,” he states.

EirTrade’s Dixon notes how the introduction of carbon fibre and lightweight alloy hardware in new generation aircraft and engines has had a significant impact on repair technologies. “3D printing, new carbon fibre repairs and new coatings have changed, and in some cases replaced, the traditional repair methods,” he explains. “Also, the surge in AI-based predictive maintenance will have an effect on the MRO market in the coming years. Better maintenance predictions will improve scheduling of MRO activities and supply chain requirements, which in turn will lead to shorter TATs, lower stock levels and, hopefully, lower maintenance costs.”

ATS has been consistently developing new repairs on exterior structural components, interior components and engine accessories, according to Santare. “One area receiving a lot of attention is flight control surfaces,” he explains. “We have seen a lot of damage to these components caused by hail and foreign objects, and have been developing engineered repairs.”

“Additionally, we are ensuring that our repairs on Boeing 737NGs and Airbus A320neos are usable on their new generation replacements. Lastly, we are seeing several repairs driven by airworthiness directives (ADs) and service

bulletins (SBs), such as the 737NG inlet and fan cowl and 737NG/MAX window heat control unit, respectively.”

Santare adds: “Going forward, we strongly believe that competitive advantage will lie in the ability to fabricate alternative parts and consume them in repair schemes. Examples of this include hubcap assemblies, flight control drives, hydraulics and interiors.”

In discussing new repairs, AAR’s Brandon Witte indicates that frequently there is an effort to address part/material shortages by developing a repair for a component or expendable part that has historically been replaced. “This expands to customers accepting alternate chemicals, materials and so on, in support of their repair needs,” he notes.

“AAR’s Component Services teams have been developing new repairs on NextGen aircraft and engine components where repairs have not previously existed. For instance, our component services facility in Grand Prairie has collaborated with an engine OEM to develop repairs that address common wear occurrences on components, ultimately eliminating the need for replacement of the component,” he reports.

Witte sums up the way ahead with a comment that all stakeholders are likely to endorse. “New repairs will continue to be developed on NextGen aircraft and engines that are yet to enter their initial heavy maintenance cycles, as well as new repairs addressing advancements in technologies, whether that is further expanding repair of composites, additive manufacturing solutions, and many others,” he concludes. ●

1. AAR checks aviation parts from its component repair facilities in Amsterdam, Thailand, Texas, Arkansas and Kansas
2. Collins Aerospace offers parts, OEM-quality repair services, repair parts and test equipment calibration services



2

A virtuous circle

Vallair's **Pascal Parant** explains how circular-economy principles now underpin modern aircraft retirement



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Today, up to 95% of an aircraft's mass can be reused, recycled or valorised
”

PASCAL PARANT

group chief commercial and marketing officer, Vallair

There are around 32,000 commercial aircraft in service or storage today, each representing substantial lifetime asset value.

Aviation has long pursued environmental virtue through both new programmes and incremental optimisation, with platforms such as the Boeing 737 and Airbus A320 evolving over decades while retaining some common parts across generations.

This longevity has created two distinct end-of-life pathways. Older 'n-2' aircraft are dismantled and transformed into scrap metal or repurposed objects. More recent generations, however, continue to yield high-value components. Their engines, APUs, landing gears and LRUs can be overhauled, recertified and returned to airline maintenance cycles.

Increasingly, this applies to 'n-1' aircraft and even to 'n', the newest generation: more than a dozen A320neo airframes with GTF engines were parted



▲ A Vallair engineer at work at the Châteauroux facility in France

out in the past year, their components helping ease supply-chain pressures.

Today, up to 95% of an aircraft's mass can be reused, recycled or valorised. Yet recycling carries ESG and legal responsibilities: aircraft contain hazardous fluids, metals, batteries, composites and even small radioactive sources. Under European law, the final owner of the aircraft is responsible for compliant dismantling, making proper teardown an environmental, regulatory and safety requirement under EASA, ICAO Annex 16 and EU waste directives.

Economic and ESG value

Using overhauled components (USM) reduces CO₂ emissions by 50-90% depending on the part – a key principle of the circular economy promoted by the EU, ICAO and AFRA.

Financially, an end-of-life narrowbody can generate anywhere from \$2.5 million to \$8 million in recovered value, with engines contributing 70-85%. Amid global shortages, returns can be realised within 6-12 months, while re-using green time on engines and landing gear can deliver 15-30% extra value in the final months of operation.

USM also shields airlines from rising OEM catalogue prices, which have increased 8-15% annually since 2022. Operators can cut maintenance costs by 20-40%, while lessors benefit from value preservation when assets are returned off-lease or unserviceable.

Vallair's role

Vallair supports aircraft through their full lifecycle: base maintenance, storage, component MRO and teardown. Its Montpellier site specialises in narrowbody maintenance and limited dismantling, while its Châteauroux facility offers narrowbody and widebody base maintenance, long-term storage and full teardown capability.

Working with specialised recycling partners, Vallair provides turnkey value-maximisation and compliance. High-value components are handled with care to extend their useful life and minimise the need for carbon-intensive new production.

Through its vertically integrated model – including P2F conversions that extend aircraft life by 15+ years – Vallair ensures aircraft deliver maximum value with minimum environmental impact, from first flight to final teardown. ●

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CHRIS HANCOCK, CEO AVIOXX

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