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MRO

Management

SCALING WITH STRATEGY

DAE Engineering's chief Jeff Wilkinson on Joramco's Hangar 7 and how it will shape the next phase of growth

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WELCOME...

The aircraft MRO market across the Middle East and North Africa (MENA) has moved on from post-pandemic recovery mode. What we are seeing now is a region thinking longer term – not just about how many aircraft are coming, but about how those fleets will be supported, sustained and kept productive over the next two decades.

Fleet growth remains the headline act. Order books across the region are vast, and the message is clear: these aircraft will need maintaining, modifying and, increasingly, life-extending. What is also important is the intent behind the investments. Across MENA, airlines and MRO providers are working to retain more maintenance activity within the region, building capability rather than exporting work elsewhere.

Our regional outlook feature in this issue (page 26) explores how that ambition is translating into reality. New hangars, engine test cells, design approvals and component repair capabilities are coming online, while training and talent development are finally receiving the attention they deserve. Supply chain disruption and labour shortages have not disappeared – far from it – but the response is becoming more coordinated and more locally focused.

This theme is brought into sharp focus by our Top Table interview with Joramco (page 16). The Jordanian MRO is scaling with purpose, combining physical expansion with digital execution and a growing emphasis on workforce development. Its



tampatra/Adobe Stock

▲ The first PAM MENA conference will take place in Dubai on February 2-3, 2026

move towards fully paperless maintenance is not about technology for technology's sake, but about improving turnaround times, quality and customer confidence – priorities that resonate across the entire region.

The same thinking underpins our launch of the first MENA region Predictive Aircraft Maintenance (PAM) conference in Dubai on February 2-3, which we preview in this issue (page 34). Predictive maintenance has moved beyond pilot projects. For MENA operators managing mixed fleets, high utilisation and tightening cost pressures, data-driven maintenance is becoming a practical tool for decision-making, not a future aspiration.

The MENA MRO market is no longer asking whether it can compete globally. The real question now is how quickly it can turn scale and ambition into consistent execution – and who will be ready when the next wave of aircraft arrives.

Craig Waters

Editor

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Winner of Business
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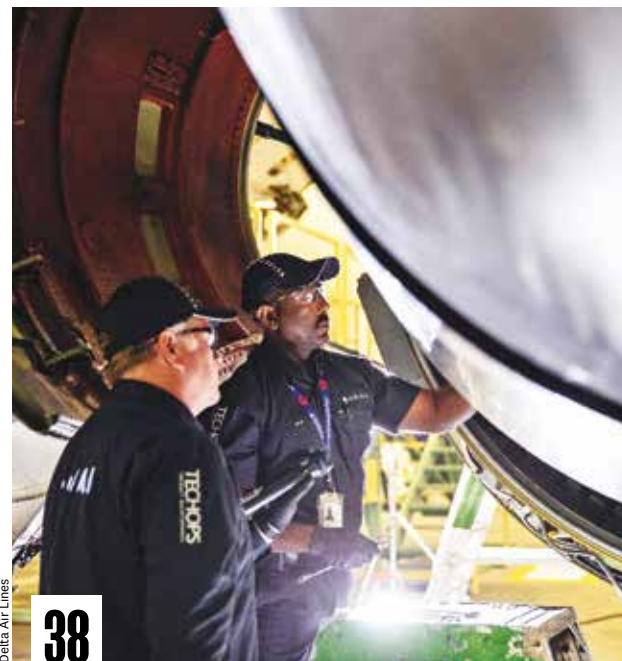
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Hangar Talk.

News from across the industry



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DIGITALISATION

Thai Airways advances its digital MRO strategy

AAR Corp has announced that Thai Airways has selected digital maintenance solutions from Trax and Aerostrat to modernise its MRO operations.

The agreement will see Thai Airways implement Trax's eMRO enterprise resource planning platform, eMobility applications and cloud hosting services to digitise maintenance workflows, enable real-time data access and improve decision-making across its global operations.

In parallel, the airline will deploy Aerostrat's Aerros maintenance

planning software to support long-range forecasting and optimisation, improving fleet availability and cost efficiency. The programme also includes AI-powered tools from both providers to support advanced planning, workflow automation and defect resolution.

The move away from paper-based processes is expected to improve turnaround times and reduce the airline's environmental footprint.

Andrew Schmidt of AAR Digital Services said: "Over the last three years, AAR has continued to invest in Trax and expand the product

offering to include Aerostrat's advanced maintenance planning software.

"We are excited our suite of products will help Thai Airways increase the airline's productivity and reduce operational costs."

Thai Airways' Cherdphan Chotikhun said: "Partnering with Trax is a game changer for Thai Airways. The next generation of Trax and Aerostrat applications will not only elevate our existing airline operational performance but also enable us to establish a state-of-the-art MRO operation that meets global standards and sets new benchmarks for efficiency and quality."



BRIEFS

- GE Aerospace will supply GEnx-1B engines to Saudia Airlines for its 2023 order of 39 Boeing 787-9 and 787-10 aircraft. The agreement also covers a multi-year MRO programme and spare engines.

- Air France Industries KLM Engineering & Maintenance and AAR Corp have completed the formation of their joint-owned nacelle MRO venture, xCelle Asia, following the receipt of regulatory approval.

- Ramco Systems will implement its next-generation aviation software at Powerhouse Engines, a South Florida-based aviation services company specialising in jet engine leasing, trading and MRO for CFM56 family engines.

- Embraer has completed a 10-month AI and data integration project with Aquarela Analytics to strengthen supply chain integration and predictability, analysing over two terabytes of operational data using combined Agile and Data Culture methodologies.

- Joramco has won the Al-Hussein bin Abdullah II Award for Voluntary Service for its 'Tree for Every Aircraft' environmental initiative which, since its launch in 2023, has planted more than 1,800 trees in wildfire-affected areas within Dibe'en Forest Reserve, Jordan.

AIRCRAFT PAINTING

MAAS Aviation and easyJet extend aircraft painting contract

MAAS Aviation has announced it will repaint all of easyJet's fleet of A320 family aircraft.

The work will take place at MAAS Aviation's Maastricht facility which features two fully lined, climate-controlled paint shops, with computerised building management systems, datalogging and high-lux lighting.

The announcement is the continuation of a multi-year painting programme between the two firms.

MAAS Aviation's Richard Marston said: "We have established a strong and transparent partnership with easyJet and have regular contact to ensure complete alignment of working procedures. This allows us to deliver superior standards of painting whilst maintaining rapid TATs."

easyJet's Sophie Michelson said: "MAAS Aviation continues to demonstrate the highest standards of exterior paint application which has helped us to achieve industry leading exterior paint processes and finish. easyJet is committed to ensuring the highest standards of aircraft appearance, whilst continuously working on gains to reduce carbon emissions."

“easyJet is committed to ensuring the highest standards of aircraft appearance, whilst continuously working on gains to reduce carbon emissions

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extend A320ceo support deal
by five years

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agree 10-year extended
777-300ER TCS deal

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Saudia Airlines 2023 order
is for 39 Boeing 787-9s
and 787-10s



COMPONENT SUPPORT

Turkish Technic extends AirSial A320ceo component support deal

Turkish Technic has expanded its long-standing collaboration with Pakistan-based private airline AirSial, signing a renewed component pool services agreement covering the carrier's Airbus A320ceo fleet.

The agreement builds on a partnership that has been in place since 2020 and has now been extended for a further five years, while also widening the scope of services provided.

Under the renewed contract, Turkish Technic will continue to deliver comprehensive component support and pooling services for AirSial's entire fleet.

This will be supported by the MRO provider's extensive inventory of components and spare parts, alongside its global network of dedicated workshops and warehouses.

The expanded services are expected to strengthen AirSial's operational continuity and improve fleet availability.

Turkish Technic's Mikail Akbulut said: "Our renewed partnership with AirSial is a meaningful step which underlines shared ambition that drives our partnership forward."

AirSial's Fazal Jilani said: "This comprehensive component pool agreement for our entire A320 fleet is a strategic cornerstone for our growth, ensuring maximum operational efficiency and fleet availability as we continue to expand our network."

66

This comprehensive component pool agreement is a strategic cornerstone for our growth



Michael Danner/Fuchs/Adobe Stock

COMPONENT SUPPORT

Lufthansa Technik and SWISS extend 777-300ER TCS deal

> Lufthansa Technik has renewed its long-standing collaboration on component support for Swiss International Air Lines' (SWISS) 12 Boeing 777-300ERs.

The exclusive 10-year contract will commence in January 2026 and extends the Total Component Support (TCS) that Lufthansa Technik has been providing to SWISS for this aircraft type over the past 10 years.

For SWISS, the contract continues to ensure component MRO, access to Lufthansa Technik's global spare parts pool, and logistical support through a dedicated homebase stock located on SWISS' premises in Zurich.

Claus Bauer of SWISS said: "We're pleased to extend this trusted cooperation, especially amid ongoing global supply chain challenges, where Lufthansa Technik's support plays a key role in ensuring component availability and securing our long-term operational performance."

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“We’re pleased to extend this trusted cooperation, especially amid ongoing supply chain challenges, where Lufthansa Technik’s support plays a key role in ensuring component availability”

Claus Bauer, head of technical fleet management, SWISS



Delta

ENGINE MRO

Delta TechOps wins milestone LEAP-1B MRO contract with Korean Air

> Delta TechOps has announced its first third-party LEAP-1B maintenance contract for the engines powering Korean Air's 737 MAX fleet.

The contract builds on existing MRO work between Delta TechOps and Korean Air, including Delta TechOps' previous support for CF6 engine maintenance for Asiana Airlines, a subsidiary of Korean Air.

Korean Air's Jongseok Yoo said: "This LEAP-1B engine agreement is a testament to our mutual focus on achieving the highest standards of operational assurance for our next-generation fleet."

Delta TechOps' John Laughter said: "Next-generation engines demand next-generation support, and this is where Delta TechOps excels. Our LEAP-1B capability is powered by the expertise of the best people in the industry, built on decades of knowledge and a commitment to innovation – delivering the performance and reliability that keep fleets flying."



OPERATIONAL CONTROL

flyadeal opens expanded control centre

> Saudi Arabia-based low-cost carrier flyadeal has opened a new Integrated Operations Control Centre (IOCC) located at its Jeddah headquarters. With four times bigger capacity, the new IOCC offers extra operational monitoring screens and space to accommodate a growing team in line with the airline's expansion plans.

The IOCC is responsible for managing, dispatching and monitoring daily flights; coordinating crew resources and aircraft maintenance; and, importantly, responding to disruptions while prioritising operational safety and punctuality at all times.



AIRCRAFT TEARDOWN

AerFin takes delivery of third B777-300ER previously operated by JAL

> AerFin has acquired a third Boeing 777-300ER, previously operated by Japan Airlines (JAL), further strengthening its support capability for the global B777 market.

The aircraft will contribute to AerFin's expanding teardown and material management programmes, enhancing the availability of used serviceable material for customers.

AerFin currently holds extensive B777 inventory across its warehouses in the UK, the Americas and the Asia-Pacific region.

AerFin's Auvinash Narayan said: "Purchasing another 777-300ER to our portfolio reflects our continued confidence in the asset and the operators who rely on it."

“**Purchasing another 777-300ER to our portfolio reflects our continued confidence in the asset and the operators who rely on it**”



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E190 Series
E190-E2



Facility Map

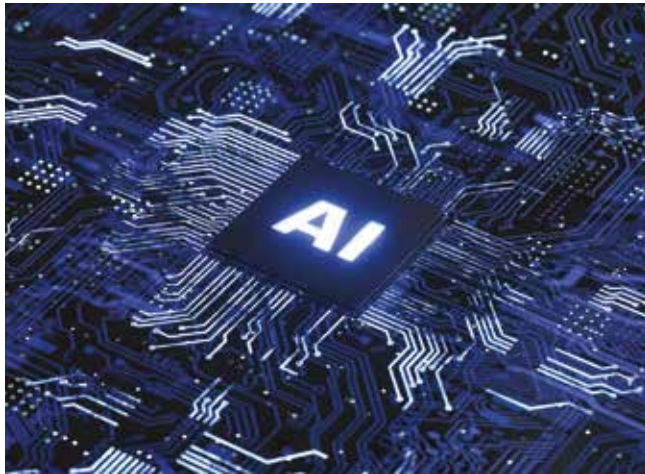


R4



In the Spotlight.

The latest partnerships, appointments
and innovations advancing the MRO sector



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< **DIGITALISATION**

SOJI AI and Airborne Capital Limited have joined forces to accelerate AI adoption across aviation. Backed by financial and intellectual investment, the collaboration will advance SOJI AI's agentic, aviation-focused software, helping MROs, airlines, lessors and OEMs automate data-heavy processes, improve decision-making, and deliver significant cost and manpower efficiencies.



ACC Aviation/LinkedIn

^ **PEOPLE NEWS**

Luca D'Urso (pictured above) has joined ACC Aviation's ACMI team as vice president – leasing consultant. A respected professional, D'Urso brings extensive airline, ACMI and charter experience, with expertise in traffic rights, slots and crew rostering, and will support global airline partnerships across ACMI and aircraft transactions. D'Urso will be based in offices in Reigate, close to London, UK.

✓ **MERGERS & ACQUISITIONS**

AAR Corp has agreed to acquire aircraft interiors engineering company Aircraft Reconfig Technologies from ZIM Aircraft Cabin Solutions for \$35 million in an all-cash transaction. The deal will expand AAR's engineering and certification capabilities and strengthen its repair and engineering segment. The transaction is expected to close in Q4 of AAR Corp's fiscal year 2026.



^ **PEOPLE NEWS**

CTS Engines has appointed Kevin Carillon (pictured above) as its new chief operating officer. With more than 25 years of global aerospace leadership, he joins from Pratt & Whitney and will oversee all operational functions with responsibility for advancing throughput, optimising processes, and ensuring best-in-class support for CTS Engines' global engine MRO customers.

✓ **ENGINE TEARDOWN**

APOC Aviation has acquired a CF34-10E for teardown, with all USM to be made available for sale or exchange. The engine was most recently operated by Kenya Airways and will be dismantled in Europe with parts to be stocked at APOC Aviation's warehouse near Schiphol.



Oleksandr/Adobe Stock



^ **ACMI**

KlasJet, a private corporate VIP charter company and ACMI leasing service provider has signed an agreement with Air Peace, the largest airline in Nigeria, to provide a Boeing 737-800 aircraft. This dual-configured aircraft will help Air Peace provide scheduled passenger and charter services more efficiently.

^ **MERGERS & ACQUISITIONS**

ITP Aero has signed a binding agreement to acquire CFM56 engine MRO specialist Aero Norway. The deal supports ITP Aero's global growth strategy and expands its aftermarket services footprint. The acquisition is expected to close in the first half of 2026, subject to customary regulatory approvals.



ASDF/Adobe Stock



^ **PEOPLE NEWS**

StandardAero has announced that Simon Dine (pictured above) has joined the company's commercial engine services sales team as vice president sales, lessors. Based in the UK, Dine will work with its sales vice presidents, commercial solutions team and asset management group to ensure the company can fully support the unique needs of the leasing community.



TRENDING STATS

22

With Hangar 7 now operational, Joramco has a total capacity of 22 maintenance lines
(from Joramco Top Table feature, p.16)

450k

AJW Group's global pooling strategy covers 450,000 line items
(from Parts Inventory Management feature, p.40)

\$156bn

The global aircraft MRO market is forecast to reach \$156 billion by 2035
(from Caerlav Industry Voices feature, p.46)

30-40

The Airbus A380 was expected to remain in service for 30-40 years
(from Green Sky feature, p.50)

SCALING WITH STRATEGY

Jeff Wilkinson details how Joramco's rolling five-year plan is redefining growth, blending capacity, capability and digitalisation to secure multi-year partnerships and elevate its global MRO standing

► **Beyond new capacity, what strategic capability gaps is Joramco aiming to close in the foreseeable, and how will those choices shape the types of customers you want to attract in 2026-2030, and beyond?**

A primary focus will be the addition of a dedicated widebody paint hangar. This hangar is currently envisioned to be configured to handle one widebody or two narrowbody aircraft simultaneously, closing a critical gap in our end-to-end service capabilities.

Additionally, with the recent addition of Hangar 7, bringing Joramco's total capacity to 22 maintenance lines, we also envisage a further maintenance hangar coming online in 2028/2029 – leading to a total of 30 bays across widebody and narrowbody aircraft types.

These choices are deliberately designed to expand our global footprint as well as supporting our key customers with improving our ability to sign multi-line, multi-year agreements rather than season-to-season works due to capacity shortages.

Finally, we have been solidifying our ability to handle multiple lines of next generation complex widebody aircraft and therefore positioning ourselves to be able to increase our coverage to top-tier airlines, lessors and operators across the Middle East, Asia, Latin America and Europe.

► **With Hangar 7 now operational, what internal data or customer trends have surprised you most, and how are those insights influencing the next phase of your rolling five-year plan?**

The most striking insight has been the rise in widebody demand, far exceeding initial expectations. We are effectively sold out of widebody



“
We see Joramco Academy evolving well beyond a single-site training centre into an exportable capability
”

JEFF WILKINSON

chief executive, DAE Engineering

slots through 2026/2027, requiring constant optimisation to accommodate customers' changing demands.

Internally, the rapid pace of this growth increased our manhours from 1.4 million in 2024 to 1.8 million in 2025, and we're forecasting two million in 2026 alone. These realities validated the expansion strategy we set in motion and reinforced the importance of multiple streams of parallel investment in talent. We are also working on strengthening our pipeline with Joramco Academy across more trades, ensuring resilience as we push toward our next milestone.



1

► **As the global MRO landscape shifts toward digital workflows, predictive maintenance and tighter turnaround expectations, which innovations or market niches does Joramco see as most critical to own in its next expansion cycle?**

Our most critical focus is the transition to a fully paperless operation. By Q1 2026, Joramco will operate entirely paper-free, significantly streamlining workflows and improving efficiency. This shift goes beyond sustainability. Digitalisation introduces enhanced security measures through biometric signoffs, removing the risk of human factor oversight errors, while improving turnaround times.

Simultaneously, it ensures quicker turnaround times (TATs) that will exceed the expectations of our



2

“By Q1 2026, Joramco will operate entirely paper-free, significantly streamlining workflows and improving efficiency”

customers. Early customer feedback from the initial rollout has been extremely positive, highlighting our belief that digital execution will be a key differentiator in the next phase of MRO competitiveness.

► Which new skillsets or roles will define the “Joramco technician of the future”, and how will Joramco Academy evolve its curriculum to meet those needs?

Against a global shortage of aviation technicians, we are actively working to attract and prepare new talent for the MRO sector.

What has become evident is creativity is key in offering various programmes to differing students – meaning differences in vocational, technical and theoretical trainings across the broad base of aviation subjects.

This has meant we have included for example the opportunity for students to obtain a BSc in Aeronautical Engineering/Maintenance in collaboration with the University of Jordan for example.

Another stream is our Structured On-the-Job Training (SOJT) programme delivered in partnership with FSTC, for our vocational students as well as a third stream for our growing intake of international students.

Together, these initiatives allow us to expand the talent pipeline, transfer best practices and expose trainees to diverse operational and regulatory environments.

Most importantly, these training courses are delivered on Joramco’s donated B737 aircraft and DAE donated engines in our training academy

1. Joramco offers various levels of maintenance services for a range of aircraft models

2. Joramco has spacious areas for aircraft parking and storage programmes

environment, in parallel to giving trainees hands-on experience on live aircraft programmes in our hangars and a clear pathway to employment opportunities within Joramco.

► How does Joramco plan to balance rapid physical expansion with maintaining – or elevating – quality, safety and TAT, especially as global labour shortages and supply chain constraints persist?

We balance this rapid expansion through a combination of management consistency, strategic hiring and operational selectivity. We have added



▲ The Joramco Academy prepares students for successful careers in aircraft maintenance engineering

“We are effectively sold out of widebody slots through 2026/2027, requiring constant optimisation to accommodate customers’ changing demands”

significantly to our management team through internal upskilling and external hires to handle the increased complexity, maintaining our focus on quality, safety, productivity and efficiency.

Crucially, our brand recognition and vast capacity have given us the luxury of being selective about the work we accept. We focus on agreements that fit Joramco’s profile, rather than overcommitting, which protects our TATs and quality standards. To mitigate labour shortages, we invested early in staffing new lines and continue to build a sustainable talent pipeline through Joramco Academy.

▶ **Joramco Academy has become a significant training brand. In your rolling five-year plan, do you see the Academy evolving into an exportable capability – for example, satellite campuses, online learning platforms, or partnerships that position Jordan as a regional MRO talent hub?**

Absolutely. In our rolling five-year plan,

we see Joramco Academy evolving well beyond a single-site training centre into an exportable capability that supports both Joramco’s growth and the wider regional MRO ecosystem.

Our ambition is to position Jordan as a regional hub for MRO talent development, leveraging the credibility Joramco has built as a global MRO provider.

In Jordan, we’ve collaborated with the University of Jordan to offer a bachelor’s degree in Aeronautical Engineering/ Maintenance as an evolution of what the Academy offers, designed to promote interest in the aviation industry and tap into its full potential. Through such efforts, we are making sure to position Jordan as a talent hub by building a pipeline of future engineers that serves not just Joramco, but also the broader regional need for skilled professionals.

▶ **Looking ahead to 2030, what would you consider a “win” that demonstrates your rolling five-year plan succeeded**

not just in adding capacity, but in transforming Joramco’s identity and influence within the global MRO ecosystem?

By 2030, a true “win” for us would mean that growth in hangars and lines is matched by growth in capability, complexity, and the quality of long-term relationships we support.

Practically, this would be reflected in a strong portfolio of multi-year, multi-fleet agreements with top-tier airlines and lessors, a balanced mix of narrowbody and widebody programmes, and an expanded end-to-end offering that includes heavy maintenance, painting, engineering support and talent development.

It would also mean that customers choose Joramco not only for cost, reliability or location, but also for technical depth, and a true partnership mindset.

Equally important, success would be demonstrated by Joramco’s influence beyond its own operations. By 2030, I would expect Joramco Academy to be recognised as a regional benchmark for MRO talent development, contributing skilled technicians to the industry and reinforcing Jordan’s position as an aviation centre of excellence. ●

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Evidence of airworthiness

Jason Dickstein explains why documentation provides
parts traceability, assurance and regulatory confidence

As an industry, we typically rely on documentation as evidence of airworthiness. For repair stations, this is an important part of the evidence upon which we rely as a foundation for airworthiness.

Ultimately, the primary goal of parts documentation is to identify an airworthiness condition, confirming that a replacement part is in the right condition for installation.

Why documentation matters

Supply chains for aircraft parts can be long and complex or short and simple. Complex supply chains can impose risk where the complexity makes it more difficult to have a relationship that instills confidence in the airworthiness of the aircraft part. If you buy a part directly from Heico, for example, then you have a higher level of confidence that Heico made the part under Heico's approved production quality system. But if you buy the same part from a third-party distributor, then you will likely rely on documentation that verifies that the part was made under Heico's production quality assurance system.

The potential complexity of the supply chain is an important driver in documentation, because documentation can help mitigate the risks associated with a more complex supply chain. For example, when you buy an aircraft part from a distributor, documentation can help show that the part was produced under a production approval system, or that a qualified person made a past



“
**The primary goal of
parts documentation
is to identify an
airworthiness condition,
confirming that a
replacement part is
in the right condition
for installation**
”

JASON DICKSTEIN

president, Washington Aviation Group

airworthiness finding upon which the installer may rely.

When I was younger, it was not unusual to see aircraft parts transactions concluded with relatively little paperwork. The industry's theory was that receiving inspectors knew what they were looking at and they could identify parts by experience or by comparison

to the illustrated parts catalogue. But over the course of the 1990s, I saw a tremendous shift in the industry toward greater reliance on documentation of past airworthiness findings.

How the industry got here

One motivating factor in this shift was a focus on unapproved aircraft parts. Congress held hearings and the then DOT Inspector General Mary Schiavo testified before Congress about unapproved parts concerns. Two main concentrations of the unapproved parts inquiries included (1) counterfeit parts; and (2) parts that were produced by manufacturers who did not hold appropriate FAA production approvals (which included lower-tier suppliers who did not hold their own production approval).

Documentation was seen as a means to record that an aircraft part had been released from a system that helped to verify airworthiness of the aircraft part, such as an FAA-approved production system (PC, PMA, or TSOA), or an FAA-approved maintenance provider who had verified airworthiness (for instance, a Part 145 repair station performing an overhaul).

Another motivating factor in the 1990s was the active promotion of documentation by a few dedicated individuals, namely Bill Tipton from Northwest Airlines, and Frank Paskiewicz from the FAA. They encouraged documentation because it helped to document past findings of airworthiness, providing installers with

verification of airworthiness status, and this allowed a systems-based approach to airworthiness findings.

When you buy aircraft parts directly from the manufacturer, you typically know whether the manufacturer holds appropriate production approval. For example, buying a part from a PMA holder or a TSOA holder means that the part is purchased from the company that has the legal obligation to ensure airworthiness. In these cases, the documentation is useful to supplement the information that you already know: the part was released by a production approval holder.

In some cases, it can be important to confirm the presence of the production approval. For example, if a company holds PMA on one part, but produces another part without PMA, then the second part might not be suitable for installation on an aircraft. This can arise where the company supports more than one industry – for example supporting both aviation and maritime needs.

If there is ever a question about the production approval, you can

confirm PMA and TSOA production approvals on the FAA's Dynamic Regulatory System (DRS) website (<http://drs.faa.gov>). That website lists PMAs and TSOAs, which can be searched by elements such as part number, manufacturer, or part-replaced (in the case of replacement PMAs). Double-checking a source's production

approval can help to provide the baseline of information necessary to make an airworthiness determination.

When buying approved parts direct from the production approval holder, the documentation can be the icing on the cake, providing assurances of airworthiness that supplement the knowledge that the part was released



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“Companies that issue ambiguous documentation about airworthiness or production approval tend to set off red flags for me”

from the quality assurance system of a production approval holder.

I've been involved in transactions where the production approval basis was less clear. Companies that issue ambiguous documentation about airworthiness or production approval tend to set off red flags for me. If the certificate of conformity/compliance ('C of C') asserts that the part *“meets the standards to which it was manufactured”*, but fails to identify those standards, then this can be a warning sign that additional scrutiny is required. Red flags like this need to be investigated, and the airworthiness condition needs to be confirmed, before an aircraft part is installed in an aircraft.

Many PMA companies pride themselves on maintaining on-the-shelf inventory to rapidly meet customer needs as they arise. But some manufacturers do not constantly maintain inventory for sale. There are a lot of reasons

why someone might be unable to buy from the production approval holder, such as lack of ready supply (resulting in long lead times), minimum order requirements (in excess of your needs), manufacturer's distribution network practices, etc.

When you cannot buy direct from the manufacturer, it is normal to buy from the aftermarket (it can also be normal to buy from the aftermarket due to other factors such as pricing, convenience, service, etc.). This is where documentation becomes particularly important, because it provides evidence of past findings upon which a buyer may be able to rely.

When documentation becomes critical

Under US law, a production approval holder may not release an aircraft part without verifying airworthiness. Documentation verifying that the part was released by a production

approval holder shows that the part was airworthy in the past. Similarly, subsequent findings of airworthiness (such as an FAA-DAR's 8130-3 tag) can also document an airworthiness finding.

In each such case where airworthiness was confirmed and documented, the installer's remaining obligation is to ensure that the aircraft part has not suffered damage or degradation since being released from the approved system; that is, the installer must verify that the airworthiness of the part has not been compromised. Documentation becomes the evidence upon which the ultimate installation decision can be made.

Because we rely on documentation, it is important to understand the meaning behind documentation. In our next *MRO Management* article (March 2026), we will examine some examples of inadequate or incorrect documentation, and we will discuss tips for document review. ●

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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





A very aMENAbLe state of affairs

The MRO sector in the Middle East and North Africa (MENA) region is on the up. **Bernie Baldwin** reports on some of the investments and agreements behind this positive scenario

Having almost fully emerged from the ramifications of the Covid pandemic, the airline industry is once again on a growth track. Even the widely reported supply chain problems throughout the industry do not seem to be preventing an uptick in most airlines' fortunes.

In the Middle East and North Africa (MENA), the sheer volume of new aircraft orders is a clear indicator of the expected development of air transport to, from and within the region.

Emirates, for example, has orders for 60 Airbus A350-900s, 10 Boeing 777 freighters, 35 Boeing 787s and 270

of the long-awaited 777-9. The carrier's sister carrier within the Emirates Group, flydubai, recently signed MoUs for 150 Airbus A321neo family aircraft and for 75 Boeing 737 MAX family aircraft with 75 options. Moreover, this year the airline will begin to take delivery of the 30 Boeing 787-9s it has on order.

Still in the UAE, Etihad awaits 28 A321LRs, 15 A330-900s (nine of which will be on lease), 18 A350-1000s, eight 777-8s, 17 777-9s and 24 787s, plus 10 A350Fs.

In Saudi Arabia, flag carrier Saudia has 18 Boeing 787-9s and 21 787-10s on order plus 10 options, the mix of which has yet to be announced. Saudia Group's low-fare operator, flyadeal, will start to

receive A321neos this year from an order for 39, and has orders for 10 A330-900s (with 10 purchase rights), set to join the fleet from 2027. The new national airline Riyadh Air, the country's second flag carrier, has orders for 60 A321neos, 25 A350-1000s (plus 25 options) and 39 Boeing 787-9s (with 33 options).

In North Africa, meanwhile, EgyptAir is inducting 16 A350-900s and 18 leased 737 MAX 8s into its fleet.

These orders present a snapshot of the numbers of aircraft entering service in the next few years – and they will all need maintaining. That sets a challenge for training and maintenance operations throughout the region.



◀ Etihad Airways Boeing 787-9 Dreamliner



▲ **Ibrahim Fathy**, chairman and chief executive, Egyptair Maintenance & Engineering

Supplemental Type Certificates (STCs). This authorisation will give the company direct control over its product development and helps to define work specifications and timelines.

According to Emirates Engineering, DOA status “paves the way for developing local design solutions that meet global standards, and strengthens the national aviation sector’s ability to carry out major aircraft modifications with greater efficiency and competitiveness”. The certification upgrades Emirates Engineering’s existing minor modification capabilities to include major cabin reconfigurations and complex design changes, and covers both Airbus and Boeing aircraft types.

The move is timely as it will support Emirates’ fleet refurbishment programme, in particular on the 60 A380s and 51 Boeing 777s set to receive the airline’s latest cabin innovations. From August 2026, the airline will be introducing several new onboard products, including the new Astrova inflight entertainment system from Panasonic Avionics and upgraded Wi-Fi connectivity using Starlink.

Additionally, DOA approval allows Emirates Engineering to develop intellectual property for components that can then be manufactured locally.

Etihad Engineering is also developing its infrastructure with a collaboration for aircraft component machining capabilities including MRO activities for aircraft wheel hubs. The company describes its partner, EDGE Group

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In its Global Services Forecast for the years 2025-2044, Airbus predicts that aftermarket demand in the Middle East & Africa will rise from the current \$19.5 billion in value to \$39.3 billion, representing a 3.7% compound annual growth rate (CAGR)

Dealing with the upsurge

In its Global Services Forecast for the years 2025-2044, Airbus predicts that aftermarket demand in the Middle East & Africa will rise from the current \$19.5 billion in value to \$39.3 billion, representing a 3.7% compound annual growth rate (CAGR).

Many maintenance providers are, thankfully, well into their plans to cater for the predicted upsurge in work. Emirates Engineering recently became the first organisation in the UAE to receive Design Organisation Approval (DOA) from the General Civil Aviation Authority (GCAA) for major aircraft modifications, through



franz massard/Adobe Stock

1. Emirates has orders for 60 Airbus A350-900s
2. Joramco is based in Jordan in the Middle East
3. Joramco will carry out C-checks on SalamAir's A320s



entity EPI, as “the cornerstone of precision engineering in the UAE’s aerospace, defence, and energy sectors” and says that the move is “a major step in advancing local capabilities and strengthening the UAE’s self-reliance in aircraft component maintenance”.

Training the next gen

Another partnership into which Etihad Engineering has entered, alongside GE Aerospace, is a strategic collaboration with Lufthansa Technik Middle East for maintenance training. The agreement will see the development of a qualification programme that will offer UAE nationals hands-on experience and career pathways in the aviation sector.

According to Etihad Engineering, the collaboration on the Maintenance Training Programme – which also involves Lufthansa Technical Training – is “specifically tailored to address the technical qualification requirements

of the UAE’s aviation workforce. The programme will combine classroom lectures with on-the-job training, covering key topics including airframe structures, aircraft maintenance and engine fundamentals”.

The partners believe the high-quality, industry-relevant training will prepare the next generation of skilled aviation professionals for successful careers in aircraft maintenance. Moreover, upon successful completion of the programme, graduates will have the opportunity to further their careers with employment at one of the three partner companies.

Jordan-based Joramco is also creating training programmes and workshops, this time in carbon fibre composite technology. The company has signed an MoU with the College of Advanced Vocational Training (CAVT) in Jordan, which will also see the establishment of specialised training production workshops and facilities at CAVT.

Under the MoU, according to Joramco, CAVT will “lead the development and design of the training programme, including the creation and approval of specialised curriculum and the full management of the training process”. Additionally, CAVT will oversee all training and production activities, including non-aviation-related work, while ensuring strict adherence to quality standards.

For its part, Joramco will provide extensive industry expertise to support curriculum development and accreditation. The company says it will also provide technical guidance and hands-on training for instructors and trainees.

As part of the collaboration – and in a similar manner to Etihad Engineering’s training partnership – Joramco will offer employment opportunities to programme graduates, subject to vacancies available at the time.

The new programme builds on the work of the Joramco Academy, which recently welcomed its new academic year with its biggest number of students yet. Almost 100 new students joined the various aircraft maintenance courses offered by the Academy. The increase in student intake includes a joint bachelor’s programme with the University of Jordan in aeronautical engineering/maintenance for which 28 students have signed up this year.

“IN MENA, THE SHEER VOLUME OF NEW AIRCRAFT ORDERS IS A CLEAR INDICATOR OF THE EXPECTED DEVELOPMENT OF AIR TRANSPORT TO, FROM AND WITHIN THE REGION”

Strengthening the UAE's position

More qualified MRO personnel will certainly be needed by Joramco given its recent new deals, such as agreements with SalamAir, Oman's low-cost carrier, and with Emirates. The agreement with SalamAir will see Joramco carrying out C-checks on the carrier's A320 fleet, while the Emirates deal means the company will continue to provide heavy maintenance services for the airline's Boeing 777 fleet until December 2028.

Another major MRO player in the Middle East is Abu Dhabi-based Sanad. It too is investing to be ready to deal with the forecast growth in MRO in the region. One recent development was the awarding of a contract to Safran Test Cells for the design, supply and construction of the test cell facility at Sanad's upcoming GTF engine MRO centre in Al Ain.

According to Sanad, the agreement represents a major milestone in the



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3



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◀ Joramco has signed an MoU with the College of Advanced Vocational Training (CAVT)

development of the UAE's aviation ecosystem and a key step forward in the implementation of the GTF engine MRO centre. The company notes that the facility will be the first of its kind in the SAMEA (South Asia, Middle East and Africa) region. Just like Emirates Engineering, Sanad emphasises how these developments contribute to building infrastructure that strengthens the UAE's position in the global MRO market.

Although purpose-built to support GTF engine programmes, the Al Ain facility will also be able to handle a wide range of narrowbody and widebody aircraft engines. Featuring two 12m x 12m test cells, the facility will feature systems to test, measure and validate engine performance following maintenance or overhaul.

Sanad points out that when it becomes operational, the facility will be capable of conducting more than 500 full-engine tests annually. The project is already under way, with service entry scheduled for the second quarter of 2028.

Over in the North Africa segment of MENA, Egyptair Maintenance & Engineering's chairman and chief executive, Ibrahim Fathy, has been observing the current position of the market and the factors affecting companies such as his.

"The MENA MRO market is currently the fastest-growing globally, projected to see a CAGR of nearly 7% through 2030," he notes. "This growth is driven by fleet diversification among low-cost carriers and 'super-connectors', alongside an aging fleet paradox where delivery delays force airlines to keep older aircraft in service longer.

"This has shifted market focus toward heavy maintenance and engine overhaul. To counter structural supply chain issues like volatile lead times and a 7.7% rise in material costs, providers are moving from reactive to proactive strategies," Fathy continues. "These include establishing strategic partnerships like the Boeing Tailored Parts Package, increasing safety stock inventory by 5-15%, utilising used serviceable material (USM) and integrating AI-driven predictive maintenance."

Fathy believes the USM market is "exceptionally vibrant" in terms of utilisation. "But it faces severe liquidity challenges due to a 'retirement drought'. As airlines extend the life of current fleets, USM has reached record valuations, accounting for up to 30% of part demand in some shops. We expect the scramble for USM to intensify as engine MRO demand peaks in 2026," he remarks.

"Currently, potential USM remains 'locked up' in flying airframes as mid-life

aircraft are kept in service or converted for cargo. To address this, Egyptair is strategically harvesting its own retired assets for life-limited parts (LLP) and expanding internal component repair shop capabilities to reduce reliance on the scarce external market."

While those challenges are being dealt with now, Fathy turns his gaze to the overall MENA market potential in the near future. "The next 12-24 months will mark a transition from recovery to high-intensity growth, with 2026 emerging as a 'delivery year' for the regional MRO sector," he declares. "We anticipate a near-term peak in engine MRO activity, with demand for legacy engine shop visits rising by 35% and newer variants surging by up to 150%.

"The market is also evolving into a self-sustaining ecosystem, reducing its historical reliance on Western facilities through massive regional investments. Furthermore, the widespread adoption of digital twin technology and AI diagnostics is expected to reduce turnaround times by up to 20%. To support this expansion, a top priority is



20%

The widespread adoption of digital twin technology and AI diagnostics is expected to reduce turnaround times by up to 20%

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Bizjet MRO prospects

According to an Airbus study, Middle Eastern companies in the survey say that 61% of their overall business is currently conducted via business aviation. And almost half (47%) of Middle Eastern organisations surveyed expect their use of business jets to increase by 50-75% over the next two years. A further 17% anticipate an increase of 75-100%.

Nick Weber, regional vice president Middle East at ExecuJet MRO Services, offers an overarching assessment of the current position of the MRO market in the MENA region, assessing factors such as – among others – supply chain pressures affecting MRO departments and independent providers headquartered in the region.

“The business aviation MRO market in the Middle East is growing steadily, supported by a rising fleet and strong utilisation,” Weber reports. “Supply-chain delays remain the main constraint, particularly for certain components and avionics. To counter this, providers are increasing local spares holdings, expanding in-region repair capabilities, and securing priority support.”

Related to the supply chain is the teardown market and used serviceable material (USM) supply. “In business aviation, USM availability is improving but it is still selective due to lower volumes compared to commercial fleets,” Weber notes. “Teardowns are occurring, but not in high numbers, meaning USM remains helpful but not a complete solution.

Aircraft and engine availability will remain tight, especially for popular business jet platforms, so operators should expect continued longer lead times.”

Immediate challenges aside, Weber also looks at the overall MENA MRO market over the next 12-24 months. “The outlook is positive, with continued demand for scheduled maintenance, interior refurbishments, avionics upgrades and pre-purchase inspections,” he confirms. “Capacity additions in the region – particularly new hangars and expanded capabilities – will support this growth. However, supply-chain constraints and skilled-labour shortages will continue to shape planning and turnaround times.”

As with commercial aviation MRO, trends occur among providers of MRO, particularly in terms of improved support programmes and capabilities. Weber observes that MROs are currently broadening in-house capabilities (NDT, composite repairs, cabin refurbishment), investing in digital workflow tools and strengthening OEM partnerships. “There’s also a noticeable increase in mobile repair team demand as operators seek faster, on-site solutions to minimise downtime,” he adds.

Weber closes on other elements affecting the Middle East MRO landscape. “Key influences include competition for licensed business jet engineers, customer expectations for shorter ground time, and continued growth in private and charter activities that is subsequently driving more frequent maintenance activity,” he declares. ●



▲ **Nick Weber**, regional vice president Middle East, ExecuJet MRO Services

upskilling the workforce to handle next-generation aircraft,” Fathy emphasises.

The chief executive closes with the trends he is seeing among MRO providers. “There is a fundamental shift toward ‘integrated lifecycle support’ that guarantees aircraft availability rather than just performing transactional repairs. One major trend is the blurring of lines between OEMs and independent MROs; for example, we recently secured official Airbus certification for structural maintenance and a tailored parts agreement with Boeing,” he reports.

“Regional providers are also becoming specialised ‘centres of excellence’ rather than generalists, investing in niche capabilities like the V2500-A5 engine shop and heat transfer equipment maintenance,” Fathy states. “Additionally, airlines are increasingly demanding power-by-the-hour contracts supported by digitalisation and predictive maintenance, which can reduce unplanned downtime by 15-20%.”

Supply chain problems aside – and they are now lessening – the aircraft MRO picture across the MENA region is one of investment and growth. There are busy times ahead. ●

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TRANSFORMING AIRCRAFT MAINTENANCE IN MENA

Aviation Business News (ABN) and MRO Management are proud to announce the launch of the first Predictive Aircraft Maintenance (PAM) Conference MENA 2026, another addition to our growing series of global PAM conferences

Building on the success of its established European and Asia-Pacific editions, PAM MENA 2026 will take place at Le Royal Méridien Beach Resort & Spa in Dubai on February 2-3, 2026. The conference will bring together the region's most forward-thinking airlines, OEMs, MRO providers and technology innovators to examine how data-driven maintenance strategies are reshaping aviation across the Middle East and North Africa.

The MENA region continues to invest heavily in new aircraft fleets, digital transformation programmes and world-class maintenance infrastructure – from the UAE and Saudi Arabia to Jordan and Morocco. As these ambitious initiatives gather momentum, predictive maintenance is emerging as a critical enabler of efficiency, safety and sustainability.

Powered by AI, advanced analytics and real-time operational data,

predictive technologies are transforming how operators plan maintenance, extend asset life and manage increasingly complex supply chains. PAM MENA 2026 will spotlight the region's growing leadership in this transformation, showcasing practical case studies, collaborative programmes and innovation across airframe, engine and component maintenance.

The conference programme

The two-day agenda at PAM MENA 2026 will feature expert panel discussions, airline-led insights and interactive sessions designed to encourage open knowledge exchange and meaningful collaboration.

Day one will include sessions exploring the future of engine health monitoring; Joramco's digitalisation journey and its move towards AI-enabled, paperless maintenance; and how prescriptive maintenance intelligence is helping

airlines reduce repeat events, optimise material positioning and improve decision-making. Safran Nacelles and Landing Systems will also present on the added value of health monitoring and predictive maintenance across Safran products.

The line-up of speakers on day one includes Buthaina Alghunaim, airworthiness duty manager at Gulf Air; Shakespear Nyamande, head of paperless digitalisation project at Joramco; Manuel Saucez, Skywise predictive maintenance airline representative at Airbus; Farhad Ali, project research and development engineer – special projects at Dubai Air Wing; Justin Sindewald, lead predictive maintenance engineer at Boeing; and Adil Al Sheibani, director of engineering at SalamAir.

Day two will feature panel discussions focused on keeping pace with evolving airworthiness regulations, smarter

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lifecycle planning for MENA fleets, and how to justify investment in predictive technologies. Additional sessions will examine how legacy aircraft data can be transformed into actionable insights, how CAMO teams can move beyond reactive KPIs by embedding predictive logic into aviation-native tools, and how maintenance data can be centralised into a single, integrated reliability workflow.

Day two speakers will include Dr Eng. Suaad Alshamsi, aviation engineer and AI & innovation researcher; Lee Carey, chief investment officer at EirTrade Aviation; Craig Skilton, vice president components at APOC Aviation; Sean Simons, co-founder and chief commercial officer at Robot Toolworx; Emna Touihri, co-founder and chief executive of AERAUT; and Prasanth Nekkallapudi, director of planning & engineering at ATS Technic.

Networking opportunities

Delegates can expect extensive networking opportunities with regional decision-makers and global technology leaders. Both days of PAM MENA will begin with a networking breakfast,

complemented by dedicated coffee and lunch breaks to allow time for informal discussions and making new connections.

A highlight of PAM MENA will be an exclusive networking dinner, held on February 2 at Siena Restaurant. The evening will provide an environment for delegates to exchange ideas, strengthen relationships and explore collaboration opportunities shaping the future of aircraft maintenance.

Sponsors

PAM MENA 2026 will feature a dedicated exhibition area, where event partners will showcase their latest tools and solutions. Confirmed sponsors include EirTrade Aviation, GE Aerospace, Boeing, Airbus, Veryon, Safran, Collins Aerospace, SITA, Joramco, GAMIT, Teledyne Aerospace Electronics, AirNxt, Liebherr-Aerospace & Transportation, Robot Toolworx, Proponent, CTS Engines, AireXpert, Worldwide Composite Services (WCS), Seabury Solutions, EXSYN, Higher Standards Aerospace (HSA) and AERAUT. ●

Confirmed speakers so far include:

1. AERAUT's Emna Touihri; 2. APOC Aviation's Craig Skilton; 3. Gulf Air's Buthaina Alghunaim; 4. EirTrade Aviation's Lee Carey; 5. AirNxt's Mahmoud El Sawah; 6. Airbus' Manuel Saucez; 7. ATS Technic's Prasanth Nekkallapudi; 8. Joramco's Shakespear Nyamande; 9. Women In Aviation Middle East's Suaad Alshamsi



Join us

PAM MENA 2026 will be more than a conference – it will serve as a regional meeting point for ideas, expertise and collaboration. Together, the industry will explore how predictive maintenance can help operators across MENA work smarter, safer and more efficiently in the years ahead.

More information on PAM MENA, as well as the annual European and Asia-Pacific editions, is available at predictiveaircraftmaintenance.com or scan the QR code below



“PAM MENA 2026 WILL BE MORE THAN A CONFERENCE – IT WILL SERVE AS A REGIONAL MEETING POINT FOR IDEAS”

STRETCHING ASSET LIFECYCLES

2026 is shaping up to be another year of extended aircraft lifecycles as delivery delays continue to reshape the aftermarket. EirTrade Aviation's **Ken Fitzgibbon** reflects on 2025 and what lies ahead

► **How has Acorn Capital Management supported EirTrade Aviation's growth since the partnership began?**

Acorn Capital Management's backing has been fundamental to our growth strategy. Their access to capital allows us to move quickly on high-value asset opportunities, while we remain focused on selecting the right acquisitions. That combination has been game-changing.

A recent example is the purchase of four A330s on stub-lease with Scissortail Aviation International Leasing. The aircraft are operating with an Asian airline and, once the leases end, the engines will be returned on green time. It shows how the right financial support can unlock projects with multiple revenue streams.

► **What challenges in 2025 best reflect the current state of the aviation aftermarket?**

The biggest issue is asset availability. OEM delivery delays are forcing airlines to operate aircraft longer, tightening the supply of aircraft and engines for teardown and USM – and that pressure is unlikely to ease soon.



“
**We're looking at
all parts of the world
for opportunities**
”

KEN FITZGIBBON

chief executive, EirTrade Aviation

Our focus has been sourcing the right assets, often through off-market opportunities where we can create an edge. To support this, we've expanded our team with experienced asset managers across the US, Europe, Singapore and Japan, strengthening our global reach.

► **Are you satisfied with EirTrade Aviation's performance in these tricky trading times?**

We performed strongly in 2025. We forecast significant growth and not only met that expectation, but exceeded it. And we're not slowing down – the plan is to take it up another gear and keep pushing our growth forward.

A big part of that is people. We continue to hire motivated young talent who can grow with the business and become the next catalysts for our success on a global scale.

► **As we enter 2026, do you see any impediments to continued industry growth?**

No, apart from the general shortage of assets. We evaluate 1,000s and only bid on 1-2%. We are now buying whole aircraft rather than engines; it's easier that way. Nevertheless, our guiding watchwords are “Don't overpay!”. We know there will always be surprises and circumstances beyond our control.

► **What's EirTrade Aviation's focus for the year ahead?**

We're looking at all parts of the world for opportunities. Where are assets being parked? What airlines have big aircraft retirement programmes on the horizon? We have activity happening everywhere: 777s being dismantled in Thailand; an E190 in Brazil; an A319 in Saudi Arabia, for example.

If we can bring aircraft back to our own engine and airframe disassembly facility in Knock (Ireland West Airport), we do. Not only is the tear-down process quicker, but we have our own hydraulic cradle to enable the removal of the LDGs, thus returning value from the asset more quickly. Being in total control delivers maximum efficiency.

► **Is there a Ken Fitzgibbon mantra for success?**

You need to buy and sell at the right price. It's as simple (and as hard) as that. ●

◀ EirTrade Aviation works to maximise the value of aviation assets



For more information about EirTrade Aviation, visit: eirtradeaviation.com



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Powering reliability

Basil Papayoti from Delta TechOps shares why legacy engines still anchor airline reliability and how operator-led insight is reshaping engine MRO for the decade ahead



“Rather than viewing legacy and new engines as competing priorities, we see these platforms as deeply connected”



BASIL PAPAYOTI

vice president of commercial,
Delta TechOps

► **From your day-to-day experience, what is currently having the biggest impact on engine MRO performance that isn't getting enough attention?**

At Delta TechOps, one of our focus areas is the continued importance of legacy engine platforms – even as the industry transitions toward next-generation technologies. There's no question that the future of the narrowbody fleet is exciting, and we're fully committed to advancing the capabilities needed to support these engines. But the reality is that legacy fleets still make up a significant portion of global flying, and they will remain essential to airline operations for years to come.

What we see every day is that sustaining strong legacy engine performance delivers real operational stability for our customers. It allows operators to maintain dependable schedules while newer fleet types mature, and while supply chains across the industry continue to normalise. At the same time, our deep OEM-aligned experience with legacy engines gives us a valuable platform for developing the next generation of repair capability. As next-gen engines evolve from 'remove-and-replace' toward true engine component repair strategies, our decades of hands-on expertise give us a head start in shaping that future.

So, rather than viewing legacy and new engines as competing priorities, we see these platforms as deeply connected – and critical to supporting operators through this transitional period.

► **How does being both an airline operator and a third-party engine MRO provider shape Delta TechOps' approach in ways that independent MROs can't replicate?**

Our dual role is one of our greatest strengths because it keeps us grounded in the operational realities that our customers face every day. When you're running a global airline the size of Delta, you gain an intimate understanding of how engines behave in the field – in different climates, flying patterns, utilisation levels and maintenance environments. That frontline experience gives us insight into issues early and helps us identify practical, innovative solutions that keep aircraft flying safely and reliably.

▼ Delta TechOps team at work



Delta Air Lines



Delta Air Lines

▲ Delta TechOps is committed to continuing investments in training, enabling technologies and new product lines

“Our deep OEM-aligned experience with legacy engines gives us a valuable platform for developing the next generation of repair capability”

What truly sets us apart is the combination of operational insight and strong OEM partnerships. Together, these perspectives allow us to move with urgency when customers need support. We know exactly where the line is between an engine that must come off-wing for safety reasons and one that can safely remain in service while an on-wing fix is performed. That balance is rooted in safety, but also in the real-world need to keep airlines moving and minimise unnecessary disruption. Maintaining that discipline is a big part of why Delta consistently leads the industry in reliability, and it's something we bring to every customer relationship.

► In a strained market, what do airline customers value most from an engine MRO partner today, and how has that played into Delta TechOps' recent momentum?

Our customers consistently tell us they need an MRO partner that can provide capacity, flexibility and a willingness to work collaboratively in a dynamic operational environment. The industry is managing significant material constraints and a high demand for shop throughput, so having access to an MRO with scale – and the ability to adapt quickly – is incredibly valuable.

At Delta TechOps, our size allows us to create capacity when it matters most, whether that means adjusting production lines, adding shifts or redirecting resources to support customers. We also bring strong field maintenance capabilities. Our teams often resolve issues right at the aircraft, which not only avoids unnecessary downtime but also helps keep operators on schedule without compromising reliability and schedules.

Another factor customers value is our longstanding OEM relationships. As both an operator and an MRO, we work closely with OEMs to help secure engineering support and materials that keep repairs moving.

Customers also tell us they appreciate the calibre of our people. Talented technicians work at Delta, and maintaining – and growing – this steady pipeline of expertise reinforces our ability to support customers at the level they expect.

► Over the next decade, do you think engine MRO will be reshaped more by people, technology or changing airline-MRO partnerships?

All three will play meaningful and integrated roles in the future of the engine MRO industry. Technology is

accelerating at a pace the industry hasn't seen before and, as new platforms mature, we're applying lessons learned from legacy engines to next-gen engines to ensure we are delivering the level of reliability airlines expect. That blend of old and new thinking is important for the long-term health of the ecosystem.

People will remain at the centre of everything. The industry is facing a global talent shortage. Meeting this challenge requires new thinking – from expanded training pipelines to tapping into emerging markets where incredible talent is quickly developing. The future of maintenance will be built by the people who keep the fleet turning every day and investing in them is essential.

Finally, partnerships are evolving in ways that will define the next decade. The traditional models between airlines, MROs and OEMs are shifting toward more collaborative, solution-driven relationships. To meet the pace of demand, we need new frameworks that help address shared challenges, whether they involve materials, workforce development or technology adoption.

At Delta TechOps, we're committed to being a partner that helps move the industry forward – not just for our own fleet, but for operators around the world. ●



REINVENTING

INVENTORY MANAGEMENT

Better management of parts inventory will be in sharper focus in 2026 as MROs and suppliers target improved service – and profitability. **Kevin Rozario** reports



“AS SUPPLY CHAINS STABILISE AND DIGITAL TOOLS MATURE, PIM IS POISED TO BECOME A SOURCE OF COMPETITIVE ADVANTAGE”

new partnership models are redefining how MROs and operators approach the fundamentals of inventory. Supply-chain delays have made certain components – for example for CFM56, V2500 and PW1100G engines – difficult to source.

Coupled with labour shortages and ageing fleets, weaknesses in how aviation has managed its parts inventories were exposed by the pandemic. But with supply chains now recovering, aviation PIM is turning from firefighting to a long-term efficiency drive.



▲
Craig Skilton

vice president components,
APOC Aviation

Supply-chain disruptions may finally be easing, but the aftershocks of the Covid era continue to reshape how the aviation industry manages its inventories. Few areas have felt the strain more acutely than the discipline of parts inventory management (PIM), where the long-standing tension between availability and cost has been pushed to its limits.

From engine component shortages to labour constraints and ageing fleets, the sector has been forced to confront weaknesses in its parts ecosystem. But from the pressures, has come adaptation. Across the MRO landscape, organisations are rethinking how they plan, source and position inventory, accelerating a shift from reactive stocking to intelligent, risk-based strategies.

The industry's playbook is changing. Digitalisation, integrated systems, predictive analytics, teardown-driven USM markets and

Turning strains into gains

McKinsey's November 2025 report, *Fly High, Stock Higher*, underscored the scale of the challenge. While aircraft deliveries have returned to 2019 levels, parts have continued to climb and inventory turns have fallen (see chart). Capital is therefore being tied up for longer periods, even as operators face pressure to improve availability.

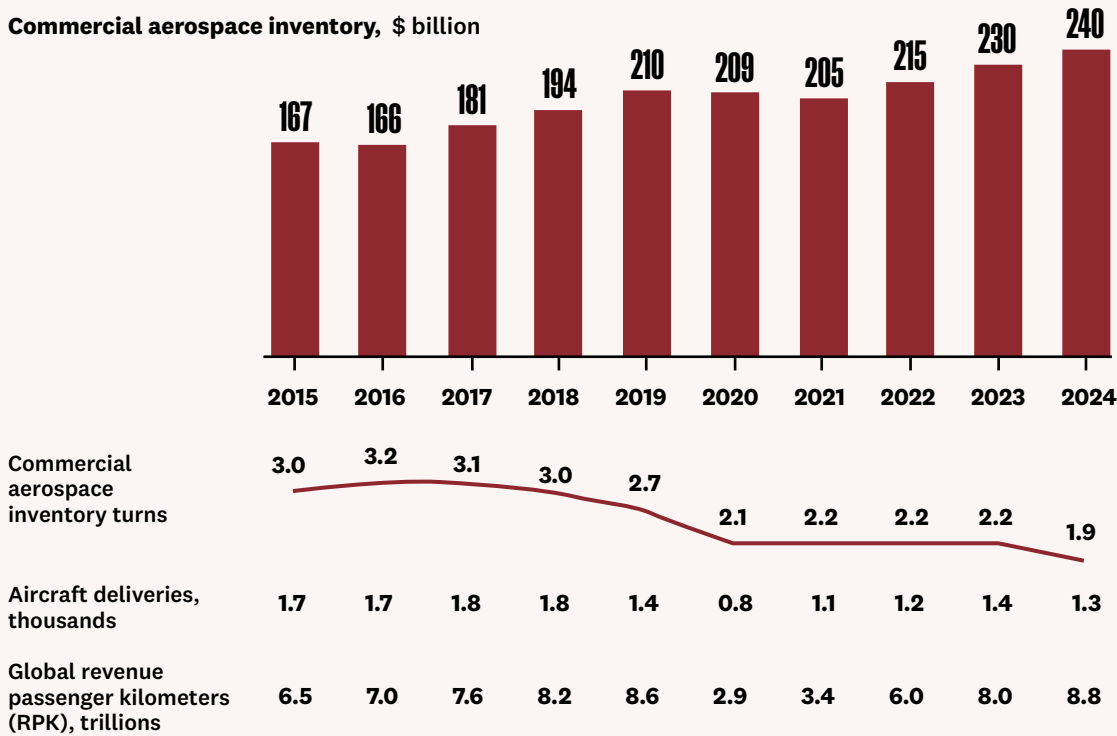
Overstocking remains expensive, but understocking can be catastrophic, with aircraft-on-ground (AOG) events costing airlines dearly. All parties have historically erred on the side of caution, holding buffers of rotables, LRUs and engine components across multiple bases. But this approach carries its own risks, including obsolescence as fleets transition to new-generation aircraft.

Against this backdrop, MROs and parts specialists have been forced to rethink their strategies. *MRO Management* has spoken with several industry leaders about how they are responding.

1. AJW Group HQ
warehouse logistics

AIRCRAFT DELIVERIES AND COMMERCIAL TRAFFIC HAVE RECOVERED TO PRE-PANDEMIC LEVELS, BUT INVENTORY TURNS HAVE DECLINED

Commercial aerospace inventory, \$ billion



Source: S&P Global Market Intelligence; McKinsey Value Intelligence Platform (n=70 Companies); McKinsey analysis



▲
Scott Symington
chief commercial officer,
AJW Group

For many organisations, the past 36 months have triggered a fundamental reassessment of how inventory is planned and deployed. Scott Symington, chief commercial officer at AJW Group, says the company has “invested heavily and streamlined our inventory strategy and operations processes to ensure we can meet customer demands and provide reliable component availability”.

A key part of that shift is AJW’s in-house optimisation tool, Apollo, which uses probabilistic modelling to guide ROI-driven stocking decisions. “By implementing automated inventory tracking systems, we can streamline tracking and management processes, thus reducing errors and delays,” explains Symington. The company’s global pooling strategy – covering 450,000 line items – is designed to position stock closer to customers by strategically placing inventory across its various hubs, including Milan Malpensa and Amsterdam.

APOC Aviation has also turned to data to improve PIM efficiency. According to Craig Skilton, vice president components, the company has moved away from purely historical stocking models. “Supply chain volatility has driven a much more disciplined, data-driven approach,” he says. “We now use dynamic strategies that factor in our growing customer base and real-time demand signals.” The result: improved availability and lower AOG risk.

For EirTrade Aviation, the response has been to expand both inventory and service

coverage. Repairs manager Erik van Son notes a “steady rise in exchange and AOG requests”, has prompted the company to significantly increase stock levels and introduce a 24/7 AOG service. This allows customers to reduce their own holdings while maintaining rapid access to critical components.

FL Technics Indonesia has focused on resilience. Chief executive Martynas Grigas says the company has adopted “a strategic buffering strategy” for fast-moving consumables and rotables, keeping them in-region to minimise logistics bottlenecks. For high-value items, the company relies on a part-exchange network and long-term fixed-price contracts. The payoff has been that turnaround times (TATs) have significantly improved and there are fewer last-minute AOG cases.

Inventory realities of ageing fleets

The industry had expected a decline in maintenance demand for older aircraft by now, but this has not gone somewhat awry. Van Son says: “Ongoing issues with the B737 MAX and GTF engines have forced airlines to continue operating legacy aircraft. The decline in MRO demand for older assets has therefore been significantly slower than originally anticipated.”

He adds: “MRO facilities and airlines that had already reduced inventory levels for these older platforms are now required to replenish stock to meet current demand at a time when OEMs are

and access large pools of stock for both legacy and next-generation fleets.

Grigas points to the growing importance of USM in supporting ageing fleets. "Part availability is a challenge for everyone," he says. "FL Technics uses age-specific data to determine possible part replacements due to fatigue. As some parts might be old and obsolete, we shift to USM sourcing. For this, we rely on non-OEMs and secondary markets such as teardown companies."

The way ahead: digitalisation, partnerships and AI

Looking ahead, industry leaders expect digital tools, smarter forecasting and deeper collaboration to play a decisive role in reshaping PIM.

At APOC Aviation, Skilton expects digital platforms to improve visibility across inventories, repair pipelines and supplier networks.

"Enhanced transparency allows PIM decisions to be made earlier," he says, "reducing the need for last-minute, AOG-driven sourcing at premium-cost."

Van Son sees predictive maintenance and advanced forecasting as valuable, but not sufficient on their own at EirTrade Aviation. "MROs and airlines will still need to actively manage their supply chains to ensure a rapid



▲ Erik van Son
repairs manager,
EirTrade Aviation

▲ EirTrade Aviation warehouse

simultaneously scaling back their supply chain capacity for these assets. This mismatch has placed considerable pressure on supply chain specialists to source parts, driving a significant increase in the prices of available components."

Symington notes that ageing fleets have increased reliance on MRO providers, making strong inventory strategies essential. AJW Group has invested in digitalisation to optimise storage and logistics, while its power-by-the-hour (PBH) solutions have allowed airlines to transfer risk

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▲ APOC Aviation parts store



▲
Martynas Grigas
 chief executive,
 FL Technics Indonesia

return to service,” he says. He also expects more strategic partnerships between MROs, airlines and USM providers, with USM specialists maintaining sufficient inventory to support quick-turn programmes.

Grigas anticipates rapid progress in AI-enabled tools. “AI can analyse millions of flight hours and historical maintenance data,” he says, improving predictions and accelerating parts searches which can, in turn, streamline PIM. He also expects these capabilities to significantly reduce AOG exposure and cost over the next two years.

Symington says that AJW Group’s digital transformation has been “the most significant development brought about by supply chain disruptions”, enabling better forecasting, monitoring of TATs, and dynamic adjustment of inventory levels.

PIM: New thinking in a new era

Helped by technology, aviation is likely to move away from the stock-heavy, reactive model that defined the pre-pandemic era. In its place, a more intelligent, predictive and collaborative approach is emerging.

Predictive analytics, USM markets, digital twins and lifecycle-based planning are all factors reshaping how airlines, MROs and OEMs look at PIM. The players that can blend technology, data and cross-sector collaboration to build resilience and efficiency into their parts inventory management will build advantage in the coming years.

While the industry’s challenges remain significant, the momentum for innovation in parts management continues. McKinsey notes that addressing inventory challenges is “not just a tactical necessity but a strategic imperative to support sustainable growth”. The consultancy says that companies adopting data-driven approaches to streamline operations “can break free from inventory gridlock” and capitalise on the sector’s potential.

As supply chains stabilise and digital tools mature, PIM is poised to become a source of competitive advantage. The next decade will reward aviation organisations that treat inventory not as a static cost centre, but as a strategic capability. ●

“ORGANISATIONS ARE RETHINKING HOW THEY PLAN, SOURCE AND POSITION INVENTORY, ACCELERATING A SHIFT FROM REACTIVE STOCKING TO INTELLIGENT, RISK-BASED STRATEGIES”

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FLEETS FLYING LONGER

Supply chain disruption and manufacturing delays are prolonging aircraft lifecycles, pushing MROs to rethink support for ageing fleets. Caerdav's **Phil Swanson** explores the impact

The global aircraft MRO market is forecast to reach \$156 billion by 2035, driven by the ageing of in-service fleets and subsequent deferred retirements, caused in no small part by delivery delays from the major OEMs. Airlines worldwide are extending leases and keeping older aircraft in service longer, as shortages of new-generation models, engines and other components persist.

Currently, there are approximately 11,500 earlier model Airbus A320s and Boeing 737s in active service. Despite not being as efficient, particularly in relation to higher fuel burn, their lower lease rates and well-understood operating costs still make them economically attractive compared to their higher priced but more efficient new generation cousins. Put simply, until manufacturers like Airbus and Boeing clear the backlog, demand for these earlier models will continue to increase.

For an independent MRO like Caerdav which specialises in the maintenance



“
The ageing fleet phenomenon is not a short-term anomaly and will persist until OEM production stabilises and supply chain constraints ease
”

PHIL SWANSON

commercial director, Caerdav

line maintenance. For MROs, more intensive maintenance extends aircraft turnaround times (TATs), increases labour demand and puts significant pressure on existing hangar capacity.

Of course, earlier model aircraft also require older generation components, with parts shortages and potential obsolescence compounding the challenge of replacing them. Older technology can be harder to source, while compliance issues can arise when those materials no longer meet today's more stringent standards. In some cases, MROs and airlines must rely on used serviceable material (USM) to bridge the gap, a practice that has grown significantly as supply chains remain constrained.

Another key factor to consider relates to the heightened scrutiny earlier models receive from the aviation authorities – for example, regulations such as FAA Part 43 mandate additional inspections and documentation during heavy maintenance and modifications. These increased compliance requirements add costs and time to the maintenance process in the hangar, in turn placing further strain on MRO resources.

Finding the skills

It is no secret that the industry is facing a shortage of well-trained and experienced aircraft technicians and licensed engineers. Retirements outpace current recruitment, and the younger engineers that are entering the sector often lack familiarity with older technologies, creating a skills gap that can slow maintenance TATs.

To counter this, MROs are responding with workforce development initiatives, including upskilling programmes, improved retention strategies and expanded apprenticeship schemes. For example, Caerdav's award-winning

of earlier model Boeing 737s and Airbus 320s, working with airlines that continue to demand minimal maintenance turnaround times, the knock-on effect has been to ramp up continuous improvement processes in the hangar for better efficiency of aircraft maintenance.

Complex and costly maintenance

Keeping older aircraft airworthy requires more frequent and more comprehensive base maintenance checks, including heavy structural inspections and corrosion control. These tasks are inherently more time-consuming and costly than





2

“Airlines worldwide are extending leases and keeping older aircraft in service longer, as shortages of new-generation models, engines and other components persist”

Aerospace Apprenticeship Programme illustrates the benefits of training the next generation so that they are able to work on both old and new aircraft alike.

The MRO response

Aside from training and upskilling the workforce, MROs like Caerday are employing a range of strategies to meet the challenges surrounding an ageing global fleet.

For example, the use of USM helps to manage component shortages and control costs, potentially offering savings of between 30-60% compared to new OEM parts. In addition, introducing advanced diagnostic tools and predictive maintenance analytic platforms can also help to accelerate complex repairs and reduce downtime.

Another major impact that longer maintenance intervals can have is the monopoly on available hangar

capacity, leading to many MROs looking to expand, including Caerday, which has doubled its number of heavy maintenance lines to four over the past two years. This expansion has come either through investments in new facilities or by finding ways to maximise operational space at an existing site.

With the demand for MRO far outstripping available supply thanks to the ageing fleet, investment in hangar capacity has become a necessity, but one that should allow MROs to reap rewards in the longer term.

The power of independence

Independent MROs, such as Caerday, are particularly well positioned to capitalise on their increased capacity and improved facilities with quick decision-making, avoiding the complexities of being owned or operated by an airline. However, the trend towards extended aircraft life is a

double-edged sword. On one hand, older aircraft generate higher maintenance volumes, which drive revenue growth. On the other hand, the complexity and cost of these events can squeeze margins and require significant investment in infrastructure, tooling and talent.

The ageing fleet phenomenon is not a short-term anomaly and will persist until OEM production stabilises and supply chain constraints ease. Some in the industry see this situation stretching into the next decade or beyond. However, the adaptability and shorter decision-making processes of independent MROs underscores their importance in the modern MRO ecosystem.

While global players focus on scale, companies like Caerday thrive by offering agility, personalised service and deep expertise in legacy aircraft platforms – qualities that are increasingly valuable as the industry navigates the ageing fleet challenge. ●

1. Advanced diagnostic tools can help to accelerate complex repairs and reduce downtime

2. Caerday is an independent MRO based in St Athan, South Wales



CAN DIGITAL DELIVER?

Are digital inspection platforms transforming airframe maintenance fast enough to offset growing shortages of experienced structural technicians?

The airframe maintenance sector is entering a period of profound transition, shaped by rapid technological innovation on one side and intensifying workforce constraints on the other.

Airlines are operating aircraft harder and for longer, pushing utilisation rates higher while extending fleet lifecycles well beyond original planning assumptions. For MRO providers, this combination is driving demand for faster inspections, shorter downtime and greater predictability in heavy maintenance planning – all at a time when skilled labour remains in short supply.

Digital inspection platforms, data-driven assessment tools and increasingly sophisticated composite repair techniques are beginning to transform how airframe heavy maintenance checks are performed. These technologies promise to reduce inspection times, improve consistency and support more informed maintenance decisions. However, while digital tools can accelerate processes and enhance accuracy, they cannot replace the deep practical expertise required for complex structural work – particularly in a sector already facing a critical skills gap.

According to Jason Grafton, managing director of MRO commercial aviation at Embraer Services & Support, the industry is having to navigate both opportunity and constraint simultaneously. With more than two decades of experience in aviation maintenance – beginning as an aircraft maintenance technician at ExpressJet Airlines in 2000 before progressing through supervisory, management and airline MRO roles – Grafton has seen the evolution of airframe maintenance from the hangar floor to today's increasingly digital environment.

Advances in composite repair techniques are playing a particularly important role in reshaping heavy maintenance economics. As composite materials become more prevalent across modern fleets, MRO providers have invested heavily in improving repair methodologies and inspection processes. Grafton notes, "Advances in composite repair and digital inspection are transforming heavy maintenance, enabling faster, more reliable, data-driven processes. Improved hot-melt adhesion testing and remote monitoring improve repair quality and reduce downtime."

These developments are helping MROs reduce aircraft ground time while improving confidence in repair outcomes – a critical factor as operators seek to maximise asset availability. Digital tools are also beginning to change how inspections are conducted and documented. Traditional visual inspections, which rely heavily on technician experience and manual assessment, are increasingly being complemented or replaced by digital solutions that provide repeatable, measurable results.

Embraer has invested in digital inspection technologies such as dent mapping to streamline assessment workflows. As Grafton explains, “Embraer’s investment in digital dent mapping halves assessment times and supports greater accuracy. These innovations streamline workflows and strengthen our maintenance capabilities, offering operators greater fleet availability and efficiency.” By reducing subjectivity and speeding up evaluation, such tools allow maintenance teams to focus more time on repair execution rather than diagnosis – a meaningful gain in a constrained labour environment.

However, while technology can improve productivity, it does not eliminate the need for experienced technicians. In fact, as inspection data becomes more detailed and repair techniques more advanced, the demand for specialised skills is arguably increasing. The most acute challenge facing airframe maintenance today is the shortage of experienced structural technicians, particularly those skilled in traditional sheet metal work.

Grafton highlights the depth of this issue, stating, “The most critical skills gap in airframe maintenance is the shortage of experienced structural technicians, especially in sheet metal work. Although new talent is entering the industry, many of them lack the practical skills required for complex repairs.” This imbalance between incoming talent and required expertise is creating capacity constraints across the sector, particularly during heavy maintenance peaks.

Training new technicians to a level where they can independently perform complex



Adrien Daste/Embraer

2

structural repairs is neither quick nor simple. While classroom instruction and digital tools can support learning, hands-on experience remains essential. Grafton notes, “Acquiring this expertise typically requires three to four years of practical experience, although the time frame varies from person to person. These constraints can impact planning and utilisation, sometimes causing delays or adjustments.” For MRO providers and operators alike, this extended training timeline complicates workforce planning and limits how quickly capacity can be scaled.

The evolution of airframe inspections therefore presents a paradox. On one hand, digital inspection platforms and advanced composite repair methods are delivering measurable improvements in efficiency, accuracy and fleet availability – benefits that directly impact airline economics. On the other, these technological gains cannot fully offset the structural workforce challenges facing the industry. The time required to develop proficient structural technicians, particularly in specialised areas, continues to create a bottleneck that technology alone cannot resolve.

Success in this environment will depend on parallel strategies. MRO providers must continue investing in digital tools that amplify technician capability and reduce inefficiencies, while also committing to long-term training and skills development programmes that address the root causes of the labour shortage. In the airframe maintenance sector, technology may be accelerating change, but it remains human expertise that ultimately sustains safety, quality and operational resilience. ●

1&2. Embraer offers comprehensive aircraft maintenance solutions

“MRO PROVIDERS MUST CONTINUE INVESTING IN DIGITAL TOOLS THAT AMPLIFY TECHNICIAN CAPABILITY AND REDUCE INEFFICIENCIES”

How to recycle GLARE

Aethos explores the challenges and opportunities in recycling the fibre-metal laminate used in the A380's upper fuselage and stabiliser leading edges

Weight and safety are paramount in aircraft engineering. When new materials offer greater safety at lower weight, especially in combating metal fatigue, they represent genuine breakthroughs.

In the early 2000s, GLARE (GLass REinforced aluminium laminate), developed at TU Delft, was one such step forward.

First used on the Airbus A380, it promised durability and improved structural performance at reduced mass. Yet 20 years later, the first A380s are already being dismantled, far earlier than anticipated. Because of GLARE's longevity, the aircraft were expected to remain in service for 30-40 years.

Market dynamics, however, shifted faster than the technology. When the A380 entered service in 2005, it suited airlines seeking hub-to-hub operations using very large aircraft.

Boeing, meanwhile, targeted carriers prioritising point-to-point travel with smaller, more flexible fleets.

Today, demand overwhelmingly favours point-to-point networks, leaving many A380s retired prematurely – and presenting an unexpected materials-recycling challenge.

The obstacles to recycling GLARE

TU Delft researchers Erik Tempelman and Ad Vlot considered GLARE's end-of-life implications during its development. Their proposed recycling concepts –



Steve Mann/Adobe Stock

▲ In the early 2000s, GLARE was first applied in the Airbus A380, the world's largest passenger airliner

heating the laminate so the layers separate spontaneously – are technically viable but incomplete.

René Alderliesten, professor of structural integrity and certification at TU Delft and involved in GLARE's early evolution, explains: "In principle it is perfectly possible to establish a recycling process for GLARE. After shredding the material, you can separate it by either burning off the plastic and reusing the aluminium, or by subjecting it to abrupt temperature fluctuations, which causes the material to separate all by itself. In the latter case it is hypothetically possible to reuse the fibre reinforced plastic as well, which can only be downcycled."

Each route, however, involves significant drawbacks. "It is quite

problematic to burn the chromates used to make the adhesive adhere to the aluminium, because they release hazardous substances into the atmosphere," he notes. "And it is very difficult to build a viable business case for recycling GLARE at scale. In my opinion, we need government regulation and funding to make that happen."

Connecting theory and practice

As with many aerospace-grade materials, the lack of a compelling economic case means GLARE is rarely recycled today. Dismantlers are instead resorting to temporary measures.

Alderliesten says: "I hear they are chopping it up, burying it and geotagging the spot – so as to be able to recycle it later on, when there is a viable process available."

This stopgap shows why a sustainable solution is essential. Aethos is helping to connect research and industry by developing proof-of-concept recycling methods that could enable a viable circular-economy pathway for GLARE. ●

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