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MRO

Management



LASER FOCUS

Joramco chief Fraser Currie on driving
business growth and leading change

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EUROPE'S MRO

A journey of continuous
improvement

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FINDING SOLUTIONS

Addressing challenges
to the supply chain

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TWISTS & TURNS

The relationship between
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ENGINEWISE



Welcome...

Like many, I'm looking forward to attending MRO Europe in Amsterdam this month. Personally, it's a great chance for me to make new connections and learn more about the hot topics of the industry. But it's also a perfect opportunity for me to let everyone I meet know about some of the exciting things Aviation Business News (ABN) and *MRO Management* have recently launched.

But if I don't get to meet you at MRO Europe, you've hopefully instead picked up, received or downloaded this issue of *MRO Management* – so read on to find out what we've been up to.

We're thrilled to have officially launched our Best Places To Work In Aviation awards; we want to know who the aviation sector's best employers are.

Aviation companies can now register to take part in an independent survey that will identify employers who are doing things right and creating cultures that make employees proud to be a part of them.

ABN will reveal the results at an awards ceremony in 2024 (details to be announced), but employers now have until December 2023 to apply before registrations close.

You can find more information about this initiative on page 32. We're really excited about it, so please do take part.

We've also released the pilot episode of ABNcast – our brand-new podcast. Recorded at the recent World Aviation Festival, ABN's editorial director Lee Hayhurst spoke with IBM Global's managing director Dee Waddell, and representatives from start-ups InterLnkd and Chain4Travel, as well as IBS Software and Nuvei.



Take a listen to the first episode – you'll find it by searching for 'ABNcast' on Spotify and YouTube – and expect more episodes from us soon.

We also have our Predictive Aircraft Maintenance (PAM) Conference coming up. Back in London this year on 27-28 November, if you haven't already secured a delegate space, I'd urge you to sign up as soon as possible as spaces are limited.

You'll find more information about PAM 2023 in this issue on page 24, alongside an interview with Liebherr-Aerospace's Bertrand Bianco who will be speaking at the conference.

There's plenty more to discover in this issue, too. I hope you enjoy reading and please do get in touch to share comments or even send in details about your latest projects to be considered as future print or online features.

Craig Waters

EDITOR

craig.waters@realresponsemedia.com

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EDITORIAL TEAM

EDITOR

Craig Waters
craig.waters@realresponsemedia.com

CONTRIBUTORS

Bernie Baldwin
Emma Kelly
Mario Pierobon
Kevin Rozario

ART DIRECTOR

Phil Couzens

SUB-EDITOR

Heather Ford

PRODUCTION MANAGER

Barnaby Moore
barnaby.moore@realresponsemedia.com

GROUP COMMERCIAL DIRECTOR

Toby Walton
toby.walton@realresponsemedia.com

GROUP COMMERCIAL MANAGER

David Hirsh
david.hirsh@realresponsemedia.com

COMMERCIAL EXECUTIVE

Jonathan Heather
jonathan.heather@realresponsemedia.com

EDITORIAL DIRECTOR

Lee Hayhurst
lee.hayhurst@realresponsemedia.com

CEO

Chris Pitchford
chris.pitchford@realresponsemedia.com

For subscriptions & enquiries:

Barnaby Moore
barnaby.moore@realresponsemedia.com

All enquiries

+44 (0) 20 8444 2554

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MRO

Management

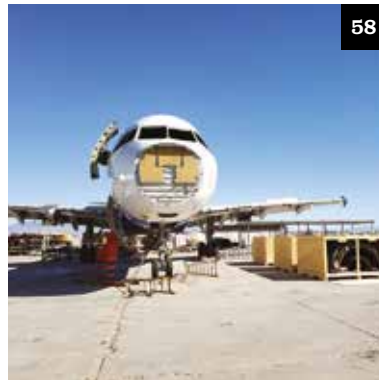
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Hangar Talk



ENGINES

Rolls-Royce Pearl 700 engine receives FAA type certification

> Rolls-Royce has announced that its Pearl 700 engine has received official certification by the Federal Aviation Administration (FAA).

The Pearl 700 is the exclusive engine for the all-new Gulfstream Aerospace Corp. business aircraft Gulfstream G700 and Gulfstream G800.

Developed at the Rolls-Royce Centre of Excellence for Business Aviation engines in Dahlewitz, Germany, the engine was custom-designed to power two of Gulfstream's latest products, enabling them to carry out ultra-long-

range missions flying almost as fast as the speed of sound.

The engine received its type certification from the European Union's Aviation Safety Agency EASA in September 2022.

During the comprehensive indoor and outdoor test programme, the engine demonstrated exceptional performance operating at sea-level and altitude conditions on both conventional jet fuel and 100 per cent sustainable aviation fuel (SAF).

It proved its ability to withstand bird-strike, cross-winds, ice, hail and

water ingestion, as well as passing the critical fan blade containment test, during which a fan blade is deliberately released at maximum speed.

Testing was conducted at various Rolls-Royce locations in Europe and North America.

“Testing was conducted at various Rolls-Royce locations in Europe and North America”



AIRCRAFT INSPECTION

Nomad Technics performs its first 12-year inspection on an Airbus ACJ319

The work carried out by Nomad Technics included a thorough examination of the aircraft's primary and secondary structure, which required the removal and re-installation of the entire cabin interior.

Nomad Technics says the inspection revealed corrosion with components to be replaced or repaired. The engineers also rectified a number of system and structure defects and carried-out inspections and maintenance work on engines and thrust reversers.

Functional and operational tests of all aircraft systems concluded the maintenance event.

Nomad Technics' Serge Kieffer said: "The successful completion of this first 12 year inspection on an Airbus ACJ319 is a great milestone and will enable us to further enhance our capabilities."

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1,500

The square metres of Lufthansa Technik Aero Alzey's new hangar in Germany

300

Embraer's Pool Program with Scoot will provide services to more than 300 repairable parts



AIRPORT DEVELOPMENT

Blackpool Airport unveils plans for five new hangars

➤ As part of the Blackpool Airport Enterprise Zone, outline planning consent is being sought at Blackpool Airport, UK for three 20,000 square-foot hangars suitable for light general aviation and small planes, including small corporate turboprops and warbird aircraft.

If approved, it would mark the first new developments at the airport in over 15 years.

The application also includes two hangars capable of housing larger planes such as a Boeing 737 or Airbus A321 for MRO activities.

The hangars would be developed at the east side of the airport on land owned by Blackpool Council.

The sites for the new smaller hangars are south and east of the current JMAX hangar. The site for the larger hangars is to the west of JMAX.

The application also includes a new road to access both sets of hangars,

plus a small 6,000 square-foot commercial business unit.

The development of the new Airport East hangars signals a period of regeneration for the airport and surrounding land, as part of the main Blackpool Airport Enterprise Zone masterplan, which involves developing a general aviation, training, maintenance and helicopter base at the east of the airport.

It is thought that creating new, modern hangars at the east side of the airport could allow some of the airport's current occupiers to move across to more sustainable purpose-built facilities, as well as creating space for new fixed base customers.

Councillor Gillian Campbell, chair of the board at Blackpool Airport Operations, said: "The future for Blackpool Airport is exciting and we are moving in the right direction towards becoming a leading transport hub with potential to grow."

BRIEFS



Embraer/2018 Travel man/Shutterstock

- Embraer has signed a Pool Program services agreement with airline Scoot to support its incoming fleet of nine E190-E2. The agreement will provide access to component exchanges and repair services for more than 300 repairable parts. The first batch of E190-E2s will be delivered to Scoot in 2024.

- Jet Aviation has constructed a new 40,000 square foot hangar at its FBO in Montana, US. The hangar has capacity to accommodate all large cabin business jets.

- Israel Aerospace Industries (IAI) and Ascent Aviation Services (Ascent) have signed an agreement to establish a conversion site and carry out P2F conversions on two lines of Boeing B777-300ER aircraft, starting in 2024 in Ascent's facilities located in Arizona, US. In order to support the programme, Ascent will build two new widebody hangars with pre-construction work having already commenced.

- AAR has launched its 2023 mid-skills gap report which warns that the aircraft mechanic shortage has reached a critical point. The report urges employers to break down silos and collaborate with high schools, colleges, non-profits and elected officials to expand early access to aviation maintenance curriculum and training.

- MTU Maintenance has opened a new training centre at its Zhuhai location in China to educate new recruits in engine maintenance, and for the professional training in disassembly, assembly and repair.



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PARTNERSHIPS

Uzbekistan Airways and Lufthansa Technik mark 30th anniversary

Since Uzbekistan Airways added its first Airbus A310-300 to its fleet in 1993, Lufthansa Technik has continuously supported the airline with technical and engineering services.

Lufthansa Technik has also assisted Uzbekistan Airways in establishing and

expanding maintenance capacities for its own and regional third-party customers.

During the 30-year period, Uzbekistan Airways has become the leading airline in Central Asia, recognised for its stable, safe and reliable operations.

Shukhrat Khudaykulov, chairman of the board of Uzbekistan Airways, said: "The importance of cooperation with Lufthansa Technik for Uzbekistan Airways is undeniable. The fact that it has been going on for 30 years speaks volumes."

The anniversary was honoured with a ceremony at the airline's base in Tashkent.



Uzbekistan Airways



LTAA

FACILITIES

Lufthansa Technik Aero Alzey opens expanded facility

Lufthansa Technik Aero Alzey (LTAA), the wholly owned subsidiary of Lufthansa Technik AG, has inaugurated a new 1,500 square-metre hangar.

The new building spans three levels and is aimed at enhancing the company's production capabilities and accommodating the increasing demand for engine overhaul.

Situated within LTAA's existing premises in Alzey, Germany, the new facility has a photovoltaic system installed across its entire roof area, and will serve as a temporary storage space for engine parts and large tools.

LTAA says that its primary objective is to enable the company to process a greater number of engines simultaneously,

aligning with the company's strategic goals for future growth.

LTAA is also venturing into advanced technologies by investing in a waterjet system to bring certain outsourced services in-house.

This is said to offer an environmentally friendly method for removing coatings from engine parts on-site, and is also more resource-efficient compared to traditional chemical stripping and mechanical methods.

LTAA says that its expansion plans extend beyond the new building with intentions to establish a logistics centre in the new industrial park and pursue further construction projects in the coming years to create further space for growth and innovation.

MBH SOLUTIONS

ST Engineering to provide component MBH solutions to Japan Airlines

Japan Airlines has signed multi-year contracts with ST Engineering for component Maintenance-By-the-Hour (MBH) solutions. ST Engineering says the contracts strengthen its longstanding relationship with the airline in integrated MRO support.

In a renewed contract, ST Engineering will continue to provide Japan Airlines' Boeing 737-800s with a full suite of component solutions covering component pooling, repair and overhaul, modification, component health monitoring and logistics services.

Additionally, under a new multi-year contract, which will commence in April 2024, ST Engineering will provide a comprehensive suite of component solutions to a fleet of A321 Passenger-to-Freighter (P2F) aircraft undergoing conversion by the group.

These A321P2F aircraft will be operated by Spring Japan, a subsidiary of Japan Airlines.



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A large industrial jet engine is the central focus on the right side of the image, mounted on a complex assembly line. In the background, two workers in dark blue shirts are visible; one is seated at a workstation with multiple computer monitors, and the other is standing next to him. The factory environment is filled with white structural beams, yellow overhead cranes, and various mechanical components. The lighting is bright and industrial.

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TREND WATCH

New partnerships, solutions and initiatives are driving innovation in the MRO industry



01

AIRCRAFT PAINTING

● J&C Aero has completed a livery change project on two Bombardier CRJ200s operated by Spanish regional airline Air Nostrum.

The works also mark J&C Aero's 700th aircraft branding project.

Air Nostrum's livery was produced in-house by J&C Aero's printing shop and delivered to Air Nostrum Engineering and Maintenance Operations (ANEM) facilities at Valencia Airport (VLC).

joramco.com.jo



05

AIRCRAFT MAINTENANCE

● Joramco has signed a new maintenance agreement with Philippine Airlines which includes servicing and modifications to five additional aircraft in the airline's fleet, specifically the Boeing 777.

The agreement serves as an extension of a previous cooperation which began in June 2023 and resulted in the successful delivery of three Boeing 777 aircraft.

Joramco's chief executive Fraser Currie said: "We continue to offer world-class services that are known for their high quality and reliability."

02

ENGINE HUB

● EngineStands24, a subsidiary of Magnetic Group, has announced it will launch a new engine stands hub in Singapore.

Scheduled to open in September 2023, the hub will cater to the growing demand for engine stands and support aircraft operators and lessors across the region.

The new hub, the company's first location in the Asian region, will initially stock engine stands for narrowbody aircraft engines, including models such as CFM56-5A/B, CFM56-7B and V2500.



03

PEOPLE NEWS

● MRO Part 145 provider Aerocare Aviation Services Limited has appointed Jonathan Bird as its new head of business development and sales.

With more than 25 years of experience in the industry, Bird will help drive the continued growth of the business.

Previously working his way up from trainee engineer through to the senior executive leadership team at Aeroco Group, Bird brings a wealth of sector knowledge and insight to his new role.

04

PEOPLE NEWS

● Lufthansa Technik has announced senior management changes: Pat Foley (below, right) is now chief executive and managing director of Lufthansa Technik Turbine Shannon; Maria Cilia (below, left) is Lufthansa Technik Malta's head of base maintenance and chief executive.

"I wish both of them the very best in their new roles," said Lufthansa Technik's Harald Gloy.

"We continue to offer world-class services that are known for their high quality and reliability"



Lufthansa Technik



Trending stats

21,000

The number of CFM56 engines currently in service (from Industry Focus - Europe feature, p.40)

35

More than a third of aviation's current MRO workforce is approaching retirement age, accounting for 35 per cent of employees aged 55 to 64 (from Supply Chain Logistics feature, p.68)

93,600

Farsound's expanded warehouse facilities in San Antonio, Texas, contains four separate buildings, each measuring 93,600 square feet. (from Top Table feature, p.54)

\$74m

Embraer's OGMA plant near Lisbon is in the midst of its biggest expansion programme, costing €74 million (from MRO & OEM Partnerships feature, p.50)

06

ENGINE SUPPORT

● ST Engineering and its commercial aerospace business has signed a five-year contract to exclusively support the MRO needs of all 36 LEAP-1B engines that power Lion Air Group's existing fleet of Boeing 737 MAX aircraft under its carriers, including Lion Air, Batik Air, Batik Air Malaysia and Thai Lion.

The agreement is in addition to an existing longstanding MRO support partnership for Lion Air Group's CFM56-5B/7B engines.

07

ENGINE SUPPORT

● Lufthansa Technik will provide MRO services for three of Cebu Pacific's CFM56-5B engines alongside Cyclean Engine wash and Aircraft Transition Services (ATS) for two A320ceo.

Konstantin Stathopoulos, vice president corporate sales Northeast Asia at Lufthansa Technik, said: "Cebu Pacific recognises us as a strategic partner in their growth plan. We are committed to providing exceptional support and are eager to meet their needs."

Cebu Pacific is the Philippine's largest low-cost airline.



08

MRO AGREEMENT

● Embraer has signed a non-binding MoU with SIAEP, a subsidiary of SIA Engineering Company Limited (SIAEC), to explore a further partnership to include MRO services for Embraer's E-Jets E2 family of aircraft.

Frank Stevens, vice president of global MRO centres for Embraer, said: "This MoU lays a good foundation for us to discuss further support of the growing E-Jets E2 fleet in the region, in addition to the established footprint of E-Jets in APAC."

Cebu



LEADING CHANGE

Now two years in the role as chief executive of the Middle East's largest independent MRO, Joramco's **Fraser Currie** gives his insights



“What’s the secret of our success? It’s simple: we have a laser focus on managing the details”

Fraser Currie, chief executive, Joramco



For more information on Joramco, visit: joramco.com

In October 2021, I was appointed by Jeff Wilkinson as the chief executive of Joramco. Jeff now leads the group in his role as group chief executive at DAE Engineering based out at Dubai. The consistency of our executive management team is a key factor to our incredible success story.

The change at Joramco started in 2017 when a strategic roadmap was created. This roadmap remains our scorecard by which we measure success: people, internal process, customers and financial.

We have brought to life our vision and mission statements and have a proven track record of delivering against them. Our sustainable behaviours underpin how we behave and how we collectively and individually take accountability for our actions.

In this article you will gain a few insights into how we have led change; however, for those interested in leading change in their own companies, I highly recommend Kotter's 8-step framework for leading change.

Workforce

It is not a cliché that ‘people are our greatest strength’. Joramco has a workforce of approximately 1,100 people, with the majority being technical staff in our operations departments. Our people focus has many elements ranging from how we attract talented people and how we engage and retain them to the entry

point of training new graduates and ensuring our staff remain current on aircraft types.

Engaging people throughout the company is key; you may have a great vision but, if you can't communicate it well, the impact will be minimal.

Our engagement includes face-to-face conversations, ‘Gemba Walks’, weekly newsletters, daily communication screen updates, a quarterly magazine, bi-annual staff road-shows, social events, bonding events, the list goes on – because it is key to our success.

The workforce journey, certainly for our technical staff, starts with our Training Academy which is the lifeblood of the organisation. However, we not only train for our own needs but we offer training to third parties who also benefit from our Part 147 programmes and our practical on-the-job training (OJT).

As the industry reports shortages of engineers, it's important that every organisation does enough to support training initiatives. We are fortunate that our Academy is attached to our hangars, so the students can gain firsthand practical training and get a feel for a live environment.

Risks and challenges

Understanding your risks and challenges presents opportunity to develop solutions and grow your business based on continuous improvements (CI). Joramco embarked on a transformation



“Being able to plan around long-term contracts gives us the ability to be more predictable on our revenue streams and our profitability”

journey back in 2017 which remains live today in the form of CI.

As part of this business continuity process, we identify both near-term risks and long-term perceived risks and categorise their potential impact.

One of the main risks being faced by our industry is the challenge of attracting new talent, and Joramco manages this as a standalone strategic project, the key pillars of which are: increasing our academy intake; offering scholarships; long-term (over the horizon) recruitment; people engagement; and offering highly rewarding and stable employment.

Customers

Something we hear a lot from our customers is that Joramco exceeds their expectations when it comes to ‘flexibility’. This is a powerful tool yet, if managed incorrectly, it can add degrees of complexity and have serious impacts on both workflow and ultimately adherence to TATs, which in turn could disrupt aircraft lines.

Timely and accurate communication is the key to success in this area and I’m

pleased to report that flexibility is vital in customers returning to Joramco.

Joramco has excellent customers who provide us with nose-to-tail lines of maintenance, some seasonally and some throughout the year, allowing us to increase efficiency and deliver consistency. Long-term contracts are a feature of the industry now, with customers signing up for five-year contracts. Customers are locking in capacity to protect their business and mitigate against the global shortage in capacity.

Record-breaking numbers

The airframe MRO business is notoriously hard to work, especially when it comes to return on investment and meeting shareholder expectations, yet Joramco is breaking records year after year.

What’s the secret of our success? It’s simple: we have a laser focus on managing the details; we invest smart as well as hiring and retaining great people.

Undoubtedly the rising demand for maintenance is having a positive effect across the MRO market and a shortage

of global MRO capacity is ensuring that MROs such as Joramco are full.

Being able to plan around long-term contracts gives us the ability to be more predictable on our revenue streams and our profitability. In the six months to June, revenue increased by 26 per cent on the prior-year period to \$69.1 million.

Sustainable growth

This year we have invested in a new hangar at our main base in Amman, Jordan. The hangar will be the largest of our six hangars with the capacity to accommodate a widebody aircraft up to A380/B777 in parallel with four narrowbody aircraft.

The hangar is scheduled to come online by the end of H1 2024 which will align with our new B737 – 800 BCF (Boeing Converted Freighter) business. The deal with Boeing makes Joramco the first MRO supplier in the Middle East to support future Boeing conversions of both domestic and foreign aircraft. 

▲ Joramco is breaking records year after year

GOODBYE PAPERWORK, HELLO DIGITISATION

Gamit's chief operating officer **Chris Leese-Wood** explains how the organisation is empowering airlines and lessors in end of lease projects



Gamit provides technical support to MROs, airlines, and aircraft owners

Gamit (part of the AMAC Aerospace Group of companies) is a key provider of professional and technical support to local and international MROs, airlines, private and corporate aircraft owners. We have modelled our business to be agile allowing us to pivot our services to the needs of our clients.

One particular service that has been a big point of conversation with our clients recently is end of lease services, and with Gamit's in-house technical services team and our very own software solution Roam (records online asset management), we are empowering airlines and lessors to control these sometimes arduous and expensive projects by digitising their records for smoother transitions and enhanced data accuracy.

Roam is a state-of-the-art technical records management system designed for airlines, lessors and MROs and allows companies to say goodbye to cumbersome paperwork and hello

to a seamless digital interface that ensures accuracy, compliance and efficiency during normal day-to-day fleet operations, audits or end of lease and entry to service projects.

Roam is powered by RDOC (Roam document OCR & classification) which takes 'dirty fingerprint records', layers them with optical character recognition metadata, then applies a status and sorts using the automated link to the M&E system. This allows our team to effectively process an asset's entire history promptly, and in a highly organised manner, saving time in lengthy projects which on average can take three months.

End of lease projects can be costly events for airlines with strict penalties in play for delays, missing paperwork and various other contracted stipulations. Additionally, lessors face losses if they are unable to move their asset on to its next customer.

Gamit is actively working to mitigate losses for these parties and is successfully



"As technology continues to evolve, the benefits of digital record keeping will likely expand"



Chris Leese-Wood, chief operating officer, Gamit



To learn more about Gamit visit gamit.co.uk

completing projects for various airlines who have employed our technical services team to ensure accuracy and compliance. This streamlines operations, reduces administrative burdens, enhances communication and fosters positive relationships between lessors and lessees.

Gamit's significant asset management experience ensures that end of lease projects are delivered on time and at reduced cost, while ensuring that the aircraft complies with the terms of the lease agreement.

Beyond the immediate end of lease phase, digitalised records continue to offer benefits. They can serve as valuable references for future lease transactions, aircraft valuations and maintenance planning.

As technology continues to evolve, the benefits of digital record keeping will likely expand, further optimising aircraft leasing processes and ensuring the efficient transfer of assets between parties.

Gamit's capabilities include materials and parts support, technical services, CAMO services pre-purchase inspection document review, digitalised records and more. 

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PLAYING 'MATCHMAKER'

ecube's **Steven Taylor** explains how 'matchmaking' aircraft sellers and buyers can help to finalise deals swiftly



ecube has recently seen increased trading activity across its three locations

The 'big pause' experienced by the aviation industry from the onset of the pandemic saw many asset owners in a holding pattern, waiting to make decisions on aircraft returning off lease and destined for end-of-life (EOL) activity.

Everyone was waiting to understand when the market would recover to a degree that provided some level of confidence in what the future held, with the fundamental metric being passenger demand and traffic which has seen a steady month-on-month recovery back to 2019 levels.

Total traffic in 2022 (measured in revenue passenger kilometres or RPKs) rose 64.4 per cent compared to 2021. Globally, full year 2022 traffic was at 68.5 per cent of pre-pandemic (2019) levels. December 2022 total traffic rose 39.7 per cent compared to December 2021 and reached 76.9 per cent of the December 2019 level.

Over the past couple of months, we have seen increased trading activity across our three locations, where parts company customers who have remained largely dormant in airframe acquisitions during the pandemic are hungry for aircraft to purchase. We see a unique opportunity to support both the aircraft sellers and buyers by 'matchmaking' both parties with available assets at our locations in UK, EU and US.

The 'ecube marketplace'

When an aircraft is not intended to have an operational future, the 'ecube marketplace' enables selling parties, our lessor and airline customers, to make decisions, send aircraft and finalise deals without delay.

This is seen as the preferred choice for our primary customers thanks to an active group of purchasing and consignment partners (parts companies and airline MROs) who, due to our third-party logistics offering, are prepared to complete deals on site.



"We are excited about what we can offer our customers at the 'ecube marketplace'"



Steven Taylor, chief commercial officer, ecube



To learn more about ecube, visit ecube.aero

Our consistency in service and output is enhanced by our diamond level disassembly status with the Airline Fleet Recycling Association (AFRA) accreditation system. As a result of this, aircraft asset owners value the placement of aircraft at ecube knowing they will have an enlarged pool of potential buyers interested in their aircraft.

The added value of ecube's marketplace offering is the 'one aircraft, three locations' principle where an aircraft owner can select the UK, EU or US based on the transactional benefits they offer.

We aim to optimise this process for the benefit of both sellers and buyers, such that the transaction process time is as quick as it can be whilst achieving the results required by both parties.

The trading of airframe assets is a fundamental element of the aviation industries' circular economy opportunities and responsibilities, as valuable components removed from all disassembled aircraft work to provide a sustainable source of high-quality material for the global fleet. With the constant demand of selling and buying, we are excited about what we can offer our customers at the 'ecube marketplace' for aircraft demands in the UK, EU and US. 

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LOOKING FOR COMMON STANDARDS

In the run-up to the 2023 Predictive Aircraft Maintenance conference in London in November, *MRO Management* asked **Bertrand Bianco**, sales and partnerships – health management at Liebherr-Aerospace & Transportation SAS, who will be speaking at the conference, his thoughts on the landscape of predictive maintenance

What is your assessment of the current state of predictive maintenance techniques in the MRO market?

Predictive maintenance is a fast-growing market with significant investments from all market stakeholders, being aircraft and equipment OEMs, MRO providers as well as airlines themselves.

With predictors reaching maturity and demonstrating performance and reliability, the focus seems to be shifting towards enhanced solutions integration, which should enable the growth of the adoption of predictive maintenance techniques.



1

On the other hand, in my opinion the biggest challenges to a wider adoption seem to be data decryption and exchange, as well as coordination with material support.

In what ways can predictive maintenance solutions lead to meaningful MRO actions?

Failures prediction tackles operational interruptions, optimises troubleshooting and allows the anticipation of line maintenance operations, such as hangar space and slots, material availability and resource management. This leads to significant maintenance savings.

Liebherr-Aerospace believes that predictive maintenance and MRO operations will develop stronger interactions over time, leading to dedicated scopes of maintenance per failure predictor.

In the short-term future, we can expect that no fault found (NFF) instances may become history.

What predictive maintenance solutions do you offer and what are the key benefits for your customers?

Liebherr-Aerospace is a leading OEM, developing, manufacturing and servicing air management systems, flight controls and landing gears as well as gears, gearboxes and electronics.



2

We have developed capabilities in data analytics to create health management solutions for our products. They are the result of the combination of our OEM design expertise along with the in-service data and repair experience of our equipment maintenance shops.

These solutions are field-proven with selected airlines operators, and we can deploy these solutions on our service platform or in partnership with integrators.

We also develop early adopter partnerships programmes with airlines. We focus on their priorities to develop new models and we collaborate alongside their development – all the way down until the demonstration of their performance and value assessment.

To what extent do you think industry collaboration is important in moving predictive maintenance forward?

I think collaboration on data will be a key enabler for the success of predictive maintenance. The industry must look for common standards and develop a pragmatic approach that is simple to deploy by all operators.

1. Bertrand Bianco, sales and partnerships – health management at Liebherr-Aerospace & Transportation SAS
2. Liebherr-Aerospace has developed capabilities in data analytics to create health management solutions for its products



“In ten years’ time, I think predictive maintenance will be mature and fully integrated in the MRO operation system and resource planning”

Do you think the industry is still feeling the impact of the Covid-19 crisis in advancing predictive maintenance?

The Covid-19 crisis affected the supply chain and repair performance when market activity was at an all-time high.

Despite important demand, bringing back aircraft to service at full fleet capacity is a challenge for the whole industry.

The use of predictive maintenance as a solution to streamline costs and logistics associated with equipment removals is therefore very welcome and will allow a quicker return to profits in the airline industry.

What other challenges must be overcome for the implementation of wider predictive maintenance?

With digital and artificial intelligence

technologies booming, we are seeing fierce competition to attract data scientists and other key resources in the aerospace digital landscape.

What does predictive maintenance in the MRO industry look like to you in ten years’ time?

In ten years’ time, I think predictive maintenance will be mature and fully integrated in the MRO operation system and resource planning.

It will bring an important efficiency gain on legacy aircraft operation and MRO supply chains.

Furthermore, we could see the predictive maintenance concept embedded into aircraft systems, but this would apply at the earliest for next generation aircraft to come. 

PREDICTIVE AIRCRAFT MAINTENANCE 2023

PREDICTIVE AIRCRAFT MAINTENANCE CONFERENCE 2023

On 27-28 November, MRO Management and its parent company Real Response Media will host the Predictive Aircraft Maintenance Conference 2023 at the Ham Yard Hotel in London to explore the future of predictive maintenance, bringing together senior level executives from airlines, OEMs, MRO specialists and big data experts.

Attendees will discover how to get the best out of predictive maintenance while overcoming the greatest challenges. Case studies will highlight best practices and how companies are successfully collaborating with industry partners, while panel discussions will explore the major topics from the perspective of all stakeholders. For more information, visit predictiveaircraftmaintenance.com



Jason Dickstein, president,
Washington Aviation Group

Supporting a robust supply chain

Jason Dickstein sheds light on some initiatives being used to maintain airworthiness amidst complex supply chain challenges



Visit washingtonaviationgroup.com for more information on the law firm which supports the aviation community

The ‘supply chain’ remains a consistent buzzword in the industry. Air carriers and MROs continue to experience supply chain problems. Solutions providers like PMA manufacturers and MROs with DER-approved repairs have become especially important to the industry as they help to keep aircraft flying despite the supply chain issues.

Even before Covid-19, independent PMA manufacturers tended to keep products on the shelf so they could make sales quickly in support of the air carriers. I know of several PMA manufacturers who kept their staff busy stocking shelves during the

“Even before Covid-19, independent PMA manufacturers tended to keep products on the shelf so they could make sales quickly in support of the air carriers”

pandemic. This immediate availability has been a tremendous benefit to air carriers seeking parts to keep their aircraft flying in the current ‘supply chain environment’.

Some of the industry’s solutions have been more creative than others. Take, for example, Fortress Transportation, a leasing company that owns CFM56 engines. Like many other companies, it is looking for ways to set itself apart from

the competition. However, listening to the quarterly conference calls reveals the brilliance that makes it truly stand out in the crowd.

Fortress Transportation has emerged as a leader among the engine leasing community by entering into deals which are intended to curtail supply chain problems. Two key initiatives are deals to recover used serviceable material (USM), and an initiative to partner on the development of PMA parts for its engines in partnership with Chromalloy.

Numerous industry presentations have highlighted that the most significant cost in an engine overhaul is the material cost. The USM and PMA deals are clever ways to improve the pool of replacement parts.

USM recovery is usually focused on rotatable parts. The recovered USM is overhauled and then reinstalled in products to maintain their airworthiness.

The PMA deal provides a stream of new parts that are FAA-approved as ready replacements. Not only does this provide a second source in the event of supply chain issues, but it also provides price competition among FAA-approved parts that will help moderate the pricing of engine MRO.



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1. The most significant cost in an engine overhaul is the material cost
2. Supply chains ensure timely delivery of aircraft components

Through its intimate involvement in the PMA process, Fortress Transportation can direct the development of the PMAs that it needs the most in order to manage its engine MRO costs. It is working with Chromalloy, which is well-known for its engineering excellence, and its significant experience in developing both novel DER repairs and complex PMA parts.

Fortress Transportation has expressed an intent to use its resources to improve turn-around time and cost on its repair processes. One way it plans to do this is by offering a 'module factory' that will offer module swaps. By swapping engine modules (like the fan module, for example) air carriers can better optimise the time-on-wing of their engines.

Fortress Transportation expects to provide a significant number of modules to the industry that will allow air carriers and others to exchange low-time modules

in order to avoid significant engine work, thus extending the green time on the engines.

Air carrier executives have revealed to us that even OEM MROs are endorsing novel solutions to the supply chain issue, with some asking the air carriers to accelerate approval of certain PMAs when the OEM facility wants to use PMAs due to its own supply chain roadblocks. This shows that these OEM

MROs are willing to abandon their own anti-PMA animus when it is crucial in supporting their air carrier customers.

While we seek to optimise the supply chain, it is important to remember the importance of airworthiness assurance. The world's aviation authorities are constantly vigilant in their effort to support airworthiness, but we need to be active participants in this process. One way that we can all help support a



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MARPA Member airlines worldwide already take advantage of PMA parts on their fleets in order to achieve benefits like safety, reliability, reduced lead times, and savings in order to remain competitive.

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Take advantage of networking opportunities with regulators, manufacturers, air carriers, MROs, and more. Sign up for MARPA-facilitated member-to-member meetings and have a full schedule before you've even left the office. Listen during workshops and educational sessions to stay current with the latest industry changes and trends, as taught by regulators, specialists, and industry leaders offering knowledge to help your business thrive.

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MITCHELL Aircraft



“One way that we can all help support a robust supply chain is by encouraging our distribution partners to become accredited under AC 00-56”

robust supply chain is by encouraging our distribution partners to become accredited under AC 00-56.

The AC 00-56 programme sets a quality assurance standard and allows distributors to adopt a voluntary quality assurance system that meets the standard. Typically, the distributor must meet a private sector standard as well as the government standard to become accredited.

One of the more popular private sector distribution standards is ASA-100, which is managed by the Aviation Suppliers Association. Distributors rely on third party auditors to periodically check their system against the standards. The ASA-100 quality standard was originally developed in partnership with the

Federal Aviation Administration (FAA), and it has subsequently been endorsed by both the European Union and China.

Since mid-summer, we have been learning more and more about the AOG Technics issues. This is a UK-based company that has been accused of selling engine parts with fraudulent documentation.

AOG Technics was accredited under the TAC-2000 programme. Accreditation audits typically examine records in order to ensure compliance with industry documentation expectations. We hope that the FAA or the European Union Aviation Safety Agency (EASA) will investigate whether the TAC-2000 accreditation records can shed some light on the fraudulent documentation allegations.

Both EASA and the FAA have issued formal warnings about engine parts from AOG Technics. At the time of writing, the facts on AOG Technics are still emerging. However, it looks likely that the AOG Technics issues will lead to engine inspections and a need for replacement parts. This, of course, will further exacerbate supply chain issues, and the industry will have even more need to turn to PMA, USM and DER repairs as safe solutions supporting continuous airworthiness. 

▲ Airworthiness standards ensure safe aircraft operation

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Julie Dickerson
Chief Executive Officer

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ABN LAUNCHES BEST PLACES TO WORK IN AVIATION

Aviation Business News (ABN) is on the hunt for the aviation sector's best employers

The UK-based B2B publisher of *MRO Management*, *Air Cargo Management*, *Aircraft Cabin Management* and *Lowcost and Regional Airline Business* has launched the Best Places To Work In Aviation awards.

Airline sector firms and companies that derive the majority of their revenue from aviation can register to take part in an independent survey carried out by US-based Workforce Research Group.

Next year, ABN will reveal the results of the surveys with firms that make the grade entitled to call themselves one of the world's Best Places To Work In Aviation.

Details of a glittering awards ceremony in 2024 will be revealed in due course, but employers now have until December to apply before registrations close.

Lee Hayhurst, editorial director of ABN, said: "The battle for talent is undoubtedly the most pressing issue that the aviation sector faces today whether that's in the cabin, the cockpit or behind the scenes in the engineering facilities that keep the world's aircraft fleet flying.

"Aviation must compete in a global market in which talent is scarce, particularly in the increasingly important area of technology and digitalisation, and so it must extend its appeal to a wider, more diverse and younger audience.

"ABN wants to champion best practice, place a focus on the companies that are

doing a great job promoting careers in aviation and highlight where the challenges are and how to overcome them. Best Places To Work In Aviation will help us do all that in print, online and in person."

Participating firms will take part in a two-part process consisting of an employer assessment and employee feedback survey in which opinions about their workplace experiences will be captured to help us determine which are the best places to work in the industry.

To qualify, companies must be publicly or privately owned and operate in the aviation sector or predominantly supply services or products to the aviation sector. They must have been in business for more than a year and have at least 15 full time employees.

The Best Places To Work In Aviation accolade will provide winners with a vital competitive edge when recruiting, give employers vital insight into how they're seen as an employer, offer a benchmark with competitors and benefit from public recognition of their efforts. 



"The battle for talent is undoubtedly the most pressing issue that the aviation sector faces today"

To find out more and to register, firms can go to the official website at bestplacestoworkaviation.com



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Dinakara Nagalla
chief executive officer
EmpowerMX

EMPOWERMX

Optimising MRO decision making

Cloud-based aircraft maintenance software company EmpowerMX has announced the launch of EMX Vision, an AI-based module.

Dinakara Nagalla, chief executive of EmpowerMX, has answered some questions we had about the new software



Visit: empowermx.com for more information



1

What is EMX Vision and how does it utilise AI and predictive modelling to benefit MRO organisations?

EMX Vision is a revolutionary tool developed by EmpowerMX, designed to transform MRO operations with the application of AI and predictive modelling. The driving force behind it is a robust machine learning base that utilises large volumes of both internal and external data.

By deploying this new module, EMX Vision draws from historical data, real-time task flows, milestones and OEM data to predict labour requirements, material probabilities, defects and turn-

around time (TAT) with an impressive degree of precision. This data is then used to help MRO organisations, regardless of size, to plan and act more effectively.

This solution signifies a significant technological leap forward, as it provides a faster and more accurate way to not only estimate costs but to also optimise nearly every aspect of MRO operations. By offering the potential to reduce costs, increase efficiency and boost productivity, EMX Vision ensures that MRO organisations have the competitive edge they need to thrive in today's challenging marketplace.

What advantages does EMX Vision offer to MRO clients in terms of Request for Proposals (RFPs), Request for Quotations (RFQs), and Quoting processes?

EMX Vision acts as a powerful mechanism for MRO clients to secure a competitive advantage. Leveraging AI and machine learning, EMX Vision accurately forecasts a range of key operational dimensions far more advanced than traditional commercial analysis.

These include labour costs, material needs, defect probabilities and turn-around times, providing MRO clients with robust and precise estimations, thereby increasing the level of accuracy, ultimately leading to a greater success. In the end, organisations are better prepared to propose more precise and competitive quotes, thanks to the precision data provided by our systems.

In addition to front end predictions, EMX Vision aids MRO organisations in effectively allocating resources, contributing to more efficient cost management. By reducing estimation errors and facilitating enhanced resource allocation, EMX Vision boosts operational efficiency, magnifies competitiveness and enables MRO organisations to improve profitability while maintaining, or in many cases, reducing operational costs, ensuring that the contracts that are won are also executed as effectively as possible.



2

“We aim to fully leverage machine learning and predictive modelling, transforming them into powerful instruments for MRO operations”

How does EMX Vision help to address check completion time forecasting, and what are its implications for MRO operations?

Through its use of AI and machine learning, EMX Vision can accurately predict the likely completion time of checks, reducing the uncertainty that often accompanies maintenance work. By using a broad range of data, including historical records of similar checks, current workload, resources, and even external factors like OEM data, EMX Vision creates a highly precise forecast. This not only helps in planning resources more effectively but also supports in streamlining operations, which is crucial to maintaining schedule adherence and customer expectation.

The implications for MRO operations are enormous. Uncertainty and

inaccuracy in check completion times can lead to costly delays, inefficient utilisation of resources and erosion of customer trust. With EMX Vision's reliable forecasting, MRO organisations can optimise operational efficiency, deliver services in a timely manner, improve customer satisfaction and loyalty and, ultimately, increase profit margins while minimising the risk of unintended operational costs.

What can you tell us about the additional AI-based impacts that EMX Vision plans to introduce in key areas of MRO operations?

EMX Vision's AI-based scope doesn't stop with planning and forecasting. The solution is geared to unleash further benefits through added use cases within MRO operations in the

near future, such as additional data access with integrations and floor level support functions.

Upcoming advancements will impact material management, procurement and aligned processes, including tooling, ground support equipment and need-by-dates planning. Our AI-based recommendation engine will forecast requirements with precision, thereby removing exorbitant costs and inefficiencies related to inventory mismanagement, over-storage or lack of timely procurement.

Moreover, EMX Vision is working towards enhancing workforce distribution. By harnessing algorithmic staffing adjustment recommendations, skill-based crew building and task assignments, we aim to optimise workforce distribution and task assignments. This approach will likely lead to substantial increases in productivity and reductions in span times.

We're also looking towards introducing an intuitive interface for seamless access to mission-critical information. This expansion of AI-based impacts will further drive precision, efficiency and highly informed decision-making, leading to overall workflow enhancement in an industry that's ever growing.

What information gaps in MRO operations does EMX Vision aim to bridge, and how will it achieve this?

EMX Vision primarily seeks to bridge several critical information gaps in the MRO industry related to materials, workforce planning, real-time execution and customer data. Many MRO organisations have limited access to comprehensive, real-time data that is intelligently prepared and delivered, leading to inefficiencies and reduced productivity.

1. Accurate predictions will lead to reduced operational costs and greater efficiency
2. EMX Vision aids MRO organisations in effectively allocating resources



◀ Workforce distribution can be better planned

“Many MRO organisations have limited access to comprehensive, real-time data that is intelligently prepared and delivered”

To address this, EMX Vision's AI-driven approach leverages vast amounts of current and historical data to paint a precise picture of operations at any given time. For instance, it uses the data to forecast crucial aspects of MRO operations like labour requirements, material probabilities, defect probabilities and turn-around time. This offers MRO organisations a more accurate and comprehensive understanding of their reality on the ground.

EMX Vision also uses the derived insights to make recommendations in terms of workforce planning and real-time task allocation, enabling MRO organisations to utilise their resources more effectively. Simply put, by leveraging advanced AI techniques, EMX Vision aims to provide MRO organisations with valuable insights that can enable them to drive operational efficiency, reduce costs and improve client deliverables.

Why do you think it is important that MRO organisations have access to modern material management and procurement processes?

Access to modern material management and procurement processes is absolutely vital for MRO organisations. Given that materials represent a significant portion of an organisation's MRO costs, it's critically important to optimise material planning, procurement and storage.

Traditional labour-intensive practices for managing and tracking materials can often lead to mistakes, inefficiencies and high inventory carrying costs. In contrast, EMX Vision empowers MRO organisations with an AI-driven approach to material management. This includes forecasting material needs, planning procurement in alignment with need-by-dates, and managing aspects such as storage locations and shipping.

By leveraging AI and machine learning, EMX Vision can predict material requirements based on work schedules and historical data, allowing for much more accurate and efficient planning and procurement. This minimises the chance of costly shortages or overstocks and ensures optimal inventory levels.

The end result is a dramatic reduction in inventory carrying costs, wasted materials and productivity losses, leading

to enhanced operational efficiency and profitability. This makes modern material management and procurement systems an essential investment for any forward-thinking MRO organisation.

What specific features does EMX Vision offer regarding the optimisation of workforce distribution and tasks?

EMX Vision is designed to significantly improve the distribution of workforce and allocation of tasks within MRO operations. By adopting an advanced AI algorithm, it delivers real-time staffing adjustment recommendations, skill-based crew building and intelligent task assignments.

Its ability to offer real-time insights into workforce distribution and task allocation significantly reduces span times and maximises productivity. It also caters specifically to specialties in the teams, ensuring that tasks are assigned to the correct skills and qualifications, thereby improving efficiency and productivity while reducing errors.

EMX Vision, by acting as a diligent overseer, can identify peak workloads and redistribute resources in real-time. This intelligent shifting of resources ensures that timeline adherence is maintained, promoting a fluid and efficient workflow through the completion of maintenance tasks and reducing overall costs.

What are the long-term goals and ambitions for EMX Vision?

EMX Vision is set to revolutionise aviation maintenance practices globally. We aim to fully leverage machine learning and predictive modelling, transforming them into powerful instruments for MRO operations.

Our goal is to evolve EMX Vision into a comprehensive tool that optimises decision making by preparing and presenting the right information at the best times. We foresee a profound step change with EMX Vision.

Looking ahead, we are committed to continually refining its capabilities to meet emerging needs and challenges in the aviation maintenance industry. 



Check in: 13 June, 20:00 hours. Check out: 5 July, 17:00 hours.

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MRO EUROPE RETURNS FOR 2023

MRO Europe 2023 will open its doors
in Amsterdam on 17-19 October



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“Alongside the exhibition, there are two types of conferences available at MRO Europe 2023”

1. MRO Europe 2023 will take place between 17-19 October
2. Networking is a key part of the event

improve their maintenance and repair operations, and how the industry can manage supply chains more effectively.

The *Go Live! Theatre* will focus more on showcasing the latest innovations, with case studies and product briefings taking place in the centre of all the action – right on the exhibition show floor. With sessions exploring topics such as unleashing the power of AI and ML for MRO, scaling-up Sustainable Aviation Fuel (SAF), and recruiting and training for talent retention, the *Go Live! Theatre* is set to be an exciting part of the event. 

Taking place between 17-19 October at the RAI Amsterdam, the Netherlands, MRO Europe 2023 is the leading event in the region for

the commercial aviation aftermarket, combining a senior level conference and international exhibition.

The event is celebrating its 25th anniversary this year and will see more than 450 solution providers exhibit.

Furthermore, this year's event looks set to attract over 9,000 attendees representing airlines, lessors, MROs, OEMs, suppliers and industry experts.

The event organisers say this is the largest of its kind in Europe and provides

an excellent opportunity for attendees to learn about the latest trends and developments in the industry, as well as to network with other professionals.

Alongside the exhibition, there are two types of conferences available at MRO Europe 2023, a paid senior level conference and a free to attend *Go Live! Theatre* on the show floor, so there's plenty of opportunity to learn from industry experts, identify opportunities in the market and engage in lively debate.

With a mix of presentations and panel discussions, and an agenda with more than 30 speakers confirmed, some of the topics to be covered during the main MRO Europe conference sessions include how digital technologies are transforming the industry, how airlines are becoming more sustainable, how airlines can



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For more information and to register to attend, visit mroeurope.aviationweek.com



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EUROPE SET FOR FULL MRO FACILITIES

The MRO market has almost recovered fully, although some leading players still warn of major challenges ahead. *Bernie Baldwin* reports

◀ FL Technics is certified by UK CAA to provide maintenance services

“Our shops are full with work and the market in general is also recovering fast”

As airlines prepare for winter schedules, for many this will mean fewer flights, but also the time when major MRO is planned for many aircraft.

The question the industry will be pondering is whether the MRO providers will be ready and available. David Stewart, a partner in the transportation practice at analysts Oliver Wyman, has been observing the current position of the MRO market in Europe. He says: “The market is very busy and demand is strong, with flying activity high for the summer and heavy maintenance hangars and engine shops fully booked for the winter.

“On the supply side, there are shortages for parts resulting from long lead times for certain commodity groups, so turn-times are longer than ideal. Also on the supply side, airline technical operations and MROs alike are experiencing labour shortages especially for licensed technicians. As a result, the market is seeing increased labour costs and a big focus on ‘recruit and retain’ strategies.”

Among the providers themselves, the views are varied but generally positive. Juozas Lapeika, deputy chief executive for production management at FL Technics, says it is “not a surprise that the MRO market has its own amplitude where currently the market has turned to the MRO side – an obvious side effect of post-Covid recovery, where demand outgrew supply. While some aircraft under storage skipped heavy maintenance checks and now need it to be completed, there is still a heavy demand for base maintenance on aircraft already in service.”

Echoing Stewart’s final point, Lapeika also bemoans a lack of technical personnel: “That does not help either. During the Covid-19 period, a significant percentage of aviation community members chose less vulnerable industries, and this challenge is now one where demand is higher than the supply.”

Iris van den Nieuwenhof, regional sales director EMEA & Australia at Fokker Services Group also sees a clear recovery. She says: “Slots are filling at

the same pace as in the pre-Covid-19 period. Our shops are full with work and the market in general is also recovering fast. Following a recent report from the CBS (Central Bureau of Statistics) in The Netherlands, seat occupancy [load factor] in The Netherlands has risen to 81 per cent, just one percentage point below the 2019 figures.

“Of course, there are also challenges, such as securing talent and coping with rising costs due to supply shortages, which keep sending shockwaves throughout the industry.”

SR Technics chief executive Matthias Düllmann is another who is optimistic that the industry is back on an upward trajectory. However, the next five years “will be filled with a multitude of challenges that will test the industry’s resilience like never before,” he says.

Düllmann adds: “For the MRO sector, the market is being redefined by a fleet in transition. Aircraft going back into service and deferred maintenance is catching up and we are entering a period of intensive MRO expenses. Third-party engine MRO providers with substantial in-house capabilities will have favourable trading conditions over the next decade. SR Technics believes that increased environmental pressure will spur new repair and overhaul developments aimed at reducing waste and fuel consumption.

“From our perspective as an OEM service centre, we feel our experience will be similar to that of the OEMs,” Düllmann continues. “Because of this relationship, we feel like we are in lockstep with the OEMs. For example, we get the latest information from OEMs on the engines, as well as access to specific repairs and service support. Our global airline customers require the highest level of quality and having the OEM relationship supports that.”

According to Inga Duglas, chief commercial officer at Magnetic Group, the growing global fleet and the number of ageing aircraft in operation means that MROs are continuing to experience high demand for the winter season. “However,” she adds, “we are also observing stronger seasonality than in the past



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few years. Airlines and asset owners who build their fleet maintenance schedules in a more extended manner (starting earlier/ending later) will become more attractive to MROs. Long-term partnerships have proven to be the best approach when turbulent times arrive. Magnetic Group, therefore, is focused on extending and securing long-term contracts."

Duglas also adds: "From an operational perspective, MRO growth is mainly limited by staff availability. Even considering various innovative solutions and more automation, the industry will face challenges until aviation becomes an attractive industry again for new talents and the younger generation."

With an overall outlook of cautious optimism, the industry also has within it certain trends and hot topics. Duglas identifies those which are pertinent to the Magnetic Group.

"We are discussing new capabilities for our Maintenance Sector, both for aircraft and engine maintenance. In other sectors, such as assets, we are offering comprehensive component solutions to

mitigate parts shortages by providing repair management services to airlines that intelligently utilise their stock and the stock of our partners."

Oliver Wyman's Stewart notes that the trends and challenges vary by MRO activity. He says: "In engine MRO, for example, each of the OEMs faces ongoing technical issues on newer engines, raising operational and engine availability challenges and demand for short-term hospital visit capacity. Meanwhile, engine shops are full with demand from more mature engines, though still with the aforementioned parts availability issues."

"In airframe MRO in Europe, there's a shortage of hangar and labour capacity, exacerbated by most airlines wanting their checks done between September and April. Labour costs are going up and turn-times are less predictable."

Speaking of turn-times, Stewart also observes: "In component MRO, the hot topic is turn-times with new OEM part lead-times in certain ATAs very long [ATA chapters, created by the Air Transportation Association (A4A), categorise aircraft parts, systems and modules]. This is driving continuing strong interest in USM and repairs, and proactive inventory actions by airlines."

"In line maintenance, the absolute focus is keeping the aircraft available for flying to support schedule integrity, which demands accuracy and robustness in planning: 'the right part in the right place at the right time... with the right-skilled technician'. Not everyone is getting this right."

For FL Technics' Lapeika, the main trends and hot topics are again led by personnel matters. He says: "Staff –

where to get them? How to train them? How to maintain the quality of services? These are the key questions and challenges to be resolved before facing long-term shortages. This is the area FL Technics is committed to in various initiatives, by leveraging global expertise to train employees, develop studies and vocational courses with various institutions, as well as investing in people and covering the costs of examination and certifications."

There are also trends in innovations. Lapeika says: "Not the nice-to-have gadgets such as drones or AR/VR eyewear, but actual solutions. I mean tangible assets and products to meet the necessity to optimise operations, improve quality, and LEAN-based processes."

The trends being seen by SR Technics centre on strong signs of recovery both for the company and across the market. Düllmann says: "We are increasing our shop visit maintenance month-to-month

1. Inga Duglas, chief commercial officer, Magnetic Group

2. Work on an engine at SR Technics

3. Production work in Tallinn at Magnetic Group company, MAC Aero Interiors

4. Iris van den Nieuwenhof, regional sales director EMEA & Australia, Fokker Services Group



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and see that the forecasts for recovery remain optimistic for 2023-2024.

“With that in mind, there are currently around 21,000 CFM56 engines in service, plus an additional 2,100 A330 engines across all manufacturers in service. This volume, coupled with aviation traffic growth projections over the next decade, will mean these engines will need to remain in service to fulfill that growth in conjunction with new deliveries, with a considerable number of CFM56s projected to remain in service in 2032. The next generation narrowbody engines are not expected to overtake the legacy engine fleet until around 2028, leading us to see maintenance of both fleets together for years to come.”

Düllmann continues: “With CFM/LEAP and widebody engines, SR Technics sees strong demand for current-generation shop visits, while addressing the need to manage light workscope shop visits for next-generation engines experiencing teething issues and the arrival of the initial wave of PRSVs. This will require MROs to develop a complex suite of skills and capabilities.

“While the current market is lively, planning ahead is vital. It is therefore important to pick up on what the trends are among MRO providers”

Regarding the next-generation engines, the aftermarket is just now starting to be created for these, with repair development and specific worksopes. As these engines mature, we will most likely see changes in specific parts to help with efficiency and extended MTBRs.”

The trend at Fokker Services Group, according to van den Nieuwenhof, is about improving the support programmes the company offers. She says: “We’re increasing our in-house repair capabilities and extending coverage to support various platforms beyond our historical Fokker fleet component maintenance and availability programme – for instance, to CRJ, Dash-8 and, most recently, Boeing 737NGs.

“Likewise, we recently signed our sustainability pledge in order to minimise our impact and contribute to a cleaner

and greener environment. We’re glad to see the entire industry increasingly committed to achieving sustainability goals. As such, our new widebody hangar in The Netherlands is equipped with a geothermal energy system which uses water from the forest nearby. Also, our teams are involved in projects related to significantly reducing the carbon footprint of flying.”

Introducing these and other technologies is another area where Fokker Services Group has invested to help lower costs and/or reduce TATs. van den Nieuwenhof says: “We’re busy with the implementation of big data analysis and warehouse automation as two leading strategies aimed at reducing TATs. In addition, we are able to combine the skills of our workforce in aircraft design, our global network, and our

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▲ FL Technics aims to create a 'just in time' culture in project management to increase efficiency and lower costs

“Third-party engine MRO providers with substantial in-house capabilities will have favourable trading conditions over the next decade”

relatively small size, all of which allows us to remain malleable and flexible.”

With the analyst's hat on, Stewart notes the identified hot topics aggregate around supply chain management – both materials and labour. He says: “From a technology perspective, that means suppliers are investing in digital technologies and processes, firstly to improve transparency of parts availability and robustness of inventory; and secondly, to improve planning and execution of work in and across hangars and shops. Additionally, more MROs are investing in repairs that are impactful on costs or TAT.”

FL Technics exemplifies Stewart's comments well, given the technology that Lapeika says the company is introducing. “Full ERP system use to increase digitalisation, plus the use of information and planning for a 'just in time' culture in project management, will be the drivers for efficiency and lowering costs.

“There will also be application of a 'repair, not replace' logic as much as possible through welding and composite repairs,” he continues. “Such an approach and related capabilities require specific

investments, certifications and in-house capabilities to make them feasible and, potentially, resolve major supply chain and sustainability challenges.”

SR Technics constantly develops new repairs in house to control TAT and cost. Düllmann says: “In the past year, we have developed more than 50 repairs. Part of our ability to handle demand volume for parts comes through collaborating with our suppliers and looking at the long-term view to determine our requirements. Additionally, we aim to secure required parts and materials with beneficial criteria, partly through long-term agreements and higher volume commitments, which help us drive lower operating costs for our customers.

“The global airlines that SR Technics currently supports are slowly transitioning to next-generation aircraft and engines. With respect to capacity on next-generation engines, the MRO industry is focused on creating the capability to not only perform the maintenance on these engines, but also the in-house part repairs which will be vital in today's landscape where supply chain issues are prevalent.”

At Magnetic Group, chief operating officer Jan Kotka believes that inflation and rising costs have placed MROs in a challenging position. He says: “We have been collaborating on an efficiency improvement project with universities and researchers from Switzerland and Finland. This has been ongoing since October 2022. We are currently in the trial phase of implementing the solutions we have identified.

“In parallel, we have been working with SkySelect to develop an automated AI-based purchasing solution. This system enables our ERP to automatically handle demand for defined items and get the best prices and lead times from our vendor base and place purchase orders automatically. Additionally, we have initiated several LEAN projects across our business and support functions, which are in the final preparation phase for moving forward with the implementation of AMOS MX software.”

Kotka's final comment arguably sums up the current state of Europe's MRO market: “Overall, it is an ongoing journey of continuous improvement.” 

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Leon Kouters, vice president sales and marketing, Fokker Services Group

FOKKER SERVICES GROUP

Taking on the responsibility

With Fokker Services Group expanding its nose-to-tail programmes, **Leon Kouters**, vice president sales and marketing, tells us more about this service and the latest airline to sign up



Visit fokkerservices.com for more information



1

Could you explain what a nose-to-tail programme entails and what are some of its primary objectives?

A nose-to-tail agreement (NTT) offered by Fokker Services Group is a comprehensive service package that allows a customer to concentrate on their main business activities related to operating their aircraft, while Fokker Services Group takes on the responsibility of ensuring component availability and maintaining these components at optimal reliability levels.

Within an NTT programme, Fokker Services Group takes care of servicing a broad spectrum of components in a

customer's fleet. These components encompass a wide array of critical parts, such as Integrated Drive Generator systems (IDGs), engine accessories, hydraulic actuators, valves, cockpit controls and instruments.

There are several key advantages associated with participating in an NTT programme. Firstly, customers benefit from minimising their investments in inventory, as Fokker Services Group manages the availability and servicing of a comprehensive range of components. This leads to reduced financial commitments related to maintaining a large inventory of spare parts.

Secondly, customers have immediate access to a readily available inventory of components, which is crucial for ensuring minimal downtime and efficient operations of their aircraft fleet.

There's also dedicated support for Aircraft On Ground (AOG) situations. AOG support ensures rapid response and resolution in the event of critical component failures, minimising the time an aircraft is grounded.

Furthermore, by entrusting Fokker Services Group with the responsibility of component availability and reliability, the customer can focus their efforts and attention on other core business areas without compromising the quality and reliability of their aircraft components.

What types of aircraft are typically included in your NTT programmes?

We have a long history with component availability and maintenance programmes. In fact, this spans four decades and at present encompasses Fokker, CRJ, Dash-8 and, recently, Boeing 737NG aircraft.

As such, we're proud to announce that AlbaStar – an on-demand flight services provider for tour operators based in Spain – is the launch customer of the B737NG NTT programme.

That sounds exciting; what more can you tell us about the partnership with AlbaStar?

Flying to an average of 160 airports per year, AlbaStar is an independent



2

“We spend a lot of time discussing requirements with each operator to ensure we can tailor the NTT programme to their specific needs”

Spanish operator and has been operating Boeing 737s, mainly from Italy and Spain, since 2010.

We will service a wide range of components of AlbaStar's fleet of five Boeing 737NGs. This includes IDGs, engine accessories, hydraulic actuators, valves, cockpit controls and instruments.

Engaging in this NTT agreement represents a unique opportunity for AlbaStar to focus on their core business, while ensuring continued competitive operation, as they delegate the responsibilities of component availability and maintenance to Fokker Services Group.

So, component and service quality and reliability is crucial during an NTT, right?

Fokker Services Group is dedicated to upholding the highest standards of reliability for aircraft components with our NTT programme. It is in our best interest to ensure that components remain operational on the aircraft for as long as possible, emphasising our commitment to maximising the longevity of these crucial parts.

50%

We currently have more than 50 per cent in-house repair capability for the Boeing B737NG platform

A critical aspect of achieving this objective lies in the strategic management of our in-house repair capabilities, carefully balancing and expanding them to optimise the repair process. This strategic expansion gives greater control over both the cost and turnaround time (TAT) associated with component repair. The goal is of course to streamline the repair process and enhance overall operational efficiency.

We currently have more than 50 per cent in-house repair capability for the Boeing B737NG platform. Ultimately, this allows us to maintain outstanding control over costs, turnaround times and reliability.

What are some of the advantages for aircraft operators in choosing a comprehensive NTT programme rather than individual maintenance and support services?

The distinct advantage lies in engaging with a component availability and maintenance programme, setting it apart from conventional approaches. Airlines and aircraft operators opting for these programmes tailored by Fokker Services Group can anticipate a substantial benefit – the assurance of component availability. By becoming integral to an extensive exchange pool within these programmes, operators significantly reduce the need for substantial investments in components, thereby optimising their financial commitments.

Moreover, Fokker Services Group implements a stocking strategy that further elevates operational efficiency.

1. Fokker Services Group takes care of servicing a broad spectrum of fleet components
2. In April 2023, Fokker Services Group extended the NTT agreement with De Havilland Canada for five more years



“We will service a wide range of components of AlbaStar’s fleet of five Boeing 737NGs”

This involves maintaining a strategic reserve of critical components directly within the customer’s facility, alongside additional stock strategically positioned across key locations in Asia and Europe. This meticulous approach helps to minimise downtime related to stocking needs and to swiftly address component requirements.

A pivotal aspect of this is the close partnership established between Fokker Services Group and the operator. This partnership extends beyond transactional interactions, with a mutual focus on achieving the highest level of reliability for the covered components. The shared objective is to ensure optimal performance and longevity of these critical parts. This relationship aligns the interests of both parties, ultimately leading to a win-win situation where reliability is maximised, and operational efficiency is significantly enhanced.

What network and support infrastructure do you provide to clients who enrol in these programmes?

Fokker Services Group has established a robust global network, strategically

positioning warehousing facilities across key regions including the Americas, Europe and Asia. This expansive network underscores our commitment to providing comprehensive services on a global scale. These strategically located facilities are vital in enabling us to efficiently serve a diverse clientele.

Central to our success is the exceptional expertise of our workforce in aircraft design, bringing unparalleled skills and knowledge to the forefront. This expertise forms the bedrock of our operations, allowing us to offer specialised services and tailored solutions that meet the unique needs of our clients.

Moreover, our facilities in Europe and Asia have been carefully chosen to optimise proximity to key industry hubs, facilitating swift and efficient service provision. This strategic positioning ensures that our customers have easy access to our services, bolstering their operational capabilities.

We’re also committed to maintaining an outstanding stock availability in close proximity to our customers’ premises. This ensures that critical components are

readily accessible, minimising delays and downtime in their operations. Utilising the latest advancements in technology, such as warehouse automation, further amplifies our efficiency and accuracy in managing inventory and fulfilling customer needs.

Can you tell us a little more about being flexible to meet the needs of clients?

We spend a lot of time discussing requirements with each operator to ensure we can tailor the NTT programme to their specific needs. Every operator is unique, and we can adjust the programme according to their set of requirements and what’s most important to them.

As an independent organisation with a high level of engineering expertise at our core and a proven track record in running NTT programmes, along with extensive in-house repair capabilities, we combine repair management, parts availability, reliability management and on-site stock services, providing fully bespoke service options to meet each operator’s individual support needs. 

▲ AlbaStar is an independent Spanish operator



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TWISTS AND TURNS

It appears that Covid-19 helped to tightened partnerships and possibly put MROs in a stronger position. *Kevin Rozario* reports

1. Ametek repairs
2. Aero Norway engine

“The pandemic changed relationships for the better as it made everyone review their strategy to see if there were better ways to satisfy the customer”

Loved up or straining at the seams? The relationship between OEMs and MROs can go from one extreme to the other – and the crisis caused by the Covid-19 pandemic certainly put some of these tie-ups to the test. But pragmatism usually wins the day and these partnerships appear to have found a new, and firmer, footing.

Some OEM mission creep was apparent before 2019. Adam Guthorn, managing director at Alton Aviation Consultancy, says: “Prior to the pandemic there was a search for margin and a lot of OEMs were pursuing aftermarket strategies to gain a larger market share.” Boeing’s GoldCare service was one early example.

Post-pandemic, those ambitions have been curtailed as OEMs have had to get back to the basics of their core businesses be it airframe, component or engine production, and also sort out the supply chain headaches that still burden the aviation world.

“The OEMs are very good at research and building materials. They are not as good at supporting their products in the aftermarket,” says Guthorn, hence the need to partner with MROs which tend to be more responsive and cost-efficient. Different levels of cooperation exist from airline-affiliated service providers and full joint ventures to more casual arrangements with independent MROs.

At Muirhead Avionics, part of Ametek MRO, David Bentley, divisional vice president and business unit manager, says: “The pandemic changed relationships for the better as it made everyone review their strategy to see if there were better ways to satisfy the customer.”

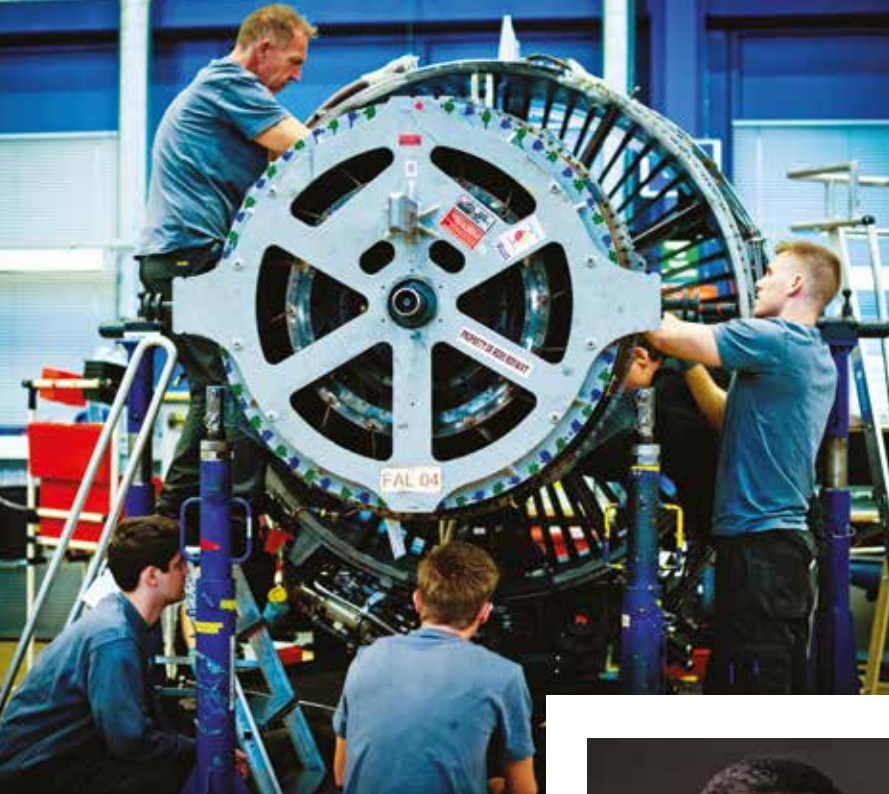
Andy Wheeler, divisional vice president and managing director at AEM, another division of Ametek MRO, adds: “Most businesses questioned their models in search of a more robust future. In some instances this led to AEM looking more laterally at our strategic alliances with OEMs.”

This kind of soul searching was common. A spokesperson at Lufthansa Technik says: “The level of suffering during the pandemic largely depended on how differentiated the setup and product offering of each market participant had been. Certain players had a high exposure due to being active solely in the field of OEM production for commercial aircraft.” Others, with stakes in defence and/or business jet platforms, or on the MRO side, were less affected.

Managing a slowdown

However, the company, part of Lufthansa Group, said that from its perspective, the pandemic did not impact its relationship to any great degree. Arild Myklebust, procurement and logistics manager at Aero Norway, says: “Aero Norway has, over the years, developed a close relationship with its suppliers, in general for the CFM56 engine family, and we were all in the same boat during Covid-19, but some were more affected than others.





1. Aero Norway maintenance
2. Adam Guthorn, managing director, Alton Aviation Consultancy
3. Ametek repairs

Siv Sivertsen

A broad-based approach

Strategic diversification is also being seen by some as a way to buffer against future crises. Embraer's OGMA plant near Lisbon, Portugal is in the midst of its biggest expansion programme, costing €74 million, to serve as a Pratt & Whitney authorised maintenance centre supporting GTF and other engines. Muirhead Avionics has also increased its capability "allowing us to provide servicing on a more significant proportion of the aircraft", says Bentley.

Looking ahead, the relationship between OEMs and MROs is bound to evolve further. Swift says: "Operators have largely been well supported in the post-Covid-19 period, with MROs playing a crucial role in ensuring continuity of service, particularly during the operators' summer schedules. This has underscored the importance of a strong OEM-MRO partnership in maintaining operational resilience.

"MROs have demonstrated their adaptability and resourcefulness during this challenging period, effectively bridging gaps in material availability. This adaptability, coupled with the flexibility shown by operators, has been instrumental in sustaining the industry."

But he warns that a notable trend in the coming year is the increased integration of alternative component sources. Swift says: "These practices



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relationships, with operators seeking robust mitigation solutions."

By that, Swift is referring to MROs exploring alternative component sources, while collaborating closely with end customers on specific initiatives. He says: "In some cases, MROs had to opt for alternate solutions due to challenges in OEM performance."

But Swift admits that due to these sustained OEM challenges, all parties – including operators, MROs and OEMs – recognised the importance of maintaining flexibility and cooperation to navigate choppy waters.

For AJW, its partnership with Honeywell has earned the group the distinction of being Honeywell's channel partner of the year, exemplifying how such collaborations can yield benefits. Additionally, over the past year, AJW has become one of Woodward's Licensed Asset Management Partners (LAMP) for various engine line-replaceable units, highlighting the continued trend of well-considered tie-ups in the industry.



"We were, of course, frustrated as messages came in from suppliers regarding a lack of raw material and shortages of chemicals etc slowing down production on their side. The most troublesome issue was that we did not know when we would get a response to a query, as many supplier staff were working from home and, in some cases, were laid off."

Such day-to-day issues heavily affected turnaround times (TAT) despite Aero Norway, like several MROs, having a full staff on-site throughout the pandemic. These challenges have lessened, but remain, and dealing with them has been a priority that has brought OEMs and MROs closer together.

For Lufthansa Technik the supply chain crisis has been a relationship builder. A company spokesperson says: "Several OEMs regard us as integral to their problem-solving efforts and actively seek collaboration on smaller joint projects, thereby yielding mutual benefits. This approach grants us enhanced access to intellectual property, enabling us to undertake in-house repairs and alleviate the pressure on their already overburdened service centres."

But situations vary. Barry Swift, chief operating officer at AJW Group, says: "Evolving mitigation plans and frequent changes put pressure on OEM/MRO relationships, as MROs often had to communicate these plans to end customers. Consequently, tension emerged in end operator/MRO

“Looking ahead, the relationship between OEMs and MROs is bound to evolve further”

have sent a signal to OEMs that their strategy of being the sole source for the aftermarket requires a consistent and uninterrupted supply chain. These trends reflect an industry that has learned to adapt and prioritise resilience, ultimately benefiting all stakeholders.”

Bentley says: “Over the next five years, those OEMs performing aftermarket services and independent MROs, like Muirhead Avionics, will need to ensure that they constantly review their strategy to remain competitive and relevant to our customers.” At Aero Norway, Myklebust expects to see closer relationships led by more communication to meet challenges head on.

Less competitive friction

Lufthansa Technik is very bullish on the back of an aviation industry which, as a whole, is experiencing a period of significant expansion. Its spokesperson says: “All primary demand clusters within the global aviation and aerospace sector are concurrently witnessing growth. On a global scale, the production of flight hours for civil transport has returned to pre-Covid-19 levels.

“This resurgence is accompanied by substantial pressure to escalate production rates, driven by robust civil aircraft order books. Moreover, the military and defence segment, along with business jet aircraft OEMs and helicopter production, are also seeing expansion.

“While the supply chain is striving to increase output it is important to acknowledge that some system OEMs are facing difficulties in keeping up. The extent to which this will influence the relationship will have to be observed in the coming months.”

There is also good news for independent MROs. Alton Aviation's Guthorn says: “There is still a very large market of non-OEM affiliated MROs out there and part of that is the time lag in where the MRO demand comes from. The heart of the business is mature aircraft, built 10 to 20 years ago. We size the market at \$112 billion dollars of MRO demand and the majority of that is coming from middle-aged aircraft.”

As for relationship development, Guthorn says: “We'll see more licensed service centres and authorised partnerships, and JVs in certain parts of the world that are hard for the OEMs to serve. I think OEMs will have a cautious approach to the aftermarket and will exert their control through partnership agreements rather than their own expansion.” 

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Lee Kelsey
Chief operating officer
Farsound

FARSOUND

Looking at the long term

With some recent leadership changes and investments in new and expanded facilities, Farsound is intending to keep pace as the MRO sector evolves. Chief operating officer **Lee Kelsey** tells us more



Visit: farsound.com for more information



1

MRO Management: How do you view Farsound's current position in the aviation industry?

Lee Kelsey: Farsound is central to the global aviation industry, especially when it comes to aircraft engine parts. We provide tailored logistics and supply chain solutions to all our customers that meet their individual challenges and match their precise specifications.

As well as supplying aero engine parts, we provide bespoke warehouse management, and line feed and advanced kitting solutions, all designed with our customers' needs in mind.

This customer focus and attention to detail are, I believe, just two of many reasons why more and more customers around the world are entrusting us with their aero engine, supply chain and logistics requirements.

Another is our dedication to quality, which is embedded in everything that we do. Our quality management systems, coupled with our experienced teams, allow us to provide our customers with fully traceable and conforming products each time.

That is of the utmost importance, both to us and to those with whom we work.

You've recently opened new and expanded facilities in Madrid, Texas and Toronto. How important are these locations for you, and what activity goes on at each?

At the end of 2021, we secured a new facility in Toronto, measuring around 20,000 square feet, to support our customers in Canada and further afield.

Located close to the airport and easily accessed by public transport, the expanded facilities are well-suited to our operations in Toronto and a much better fit for us in terms of layout, scale and our sustainable working goals.

Then, at the end of 2022, we opened a brand new facility in Madrid in Spain. It was developed to service Farsound's customers across Spain, Portugal and the rest of Europe. In particular, the new facility supports our work with Spanish flag carrier airline Iberia and its fleet. The facility includes a brand new trolley system, designed and created specifically to transport aero engine parts around the warehouse. We are now rolling the trolley system out to other Farsound facilities around the world.

Finally, in the spring of 2023, we expanded our warehouse facilities in San Antonio, Texas to help meet the needs of our growing customer base across the US, Canada and Latin America.

That warehouse contains four separate buildings, each measuring 93,600 square feet. The site also has spacious office facilities and plenty of parking for staff.



2

“We are very pleased to have strengthened our leadership team in recent months, in order to support our next phase of global expansion”

Tell us more about your recent HQ opening in the UK – was this a strategic decision?

Our new, purpose-built UK HQ building in Brentwood, Essex is an integral part of our global growth strategy and investment in our teams and capabilities. Its opening was a key part of our wider growth and development strategy.

Our new HQ building has been a very special project for us all at Farsound because we had significant input into how the facilities were designed and built.

Planning was extensive, as we wanted to not only cater for our existing staff's needs, but also allow ourselves room to grow within the HQ building in the future, as our teams and services expand.

Staff facilities include an on-site canteen, gym, yoga area and games room, which all support the wellbeing and work-life balance of our people.

What innovations and technologies have you incorporated into your new HQ facilities?

The building is equipped with some of the latest IT and logistics solutions. We are especially proud of our £1.2 million, state-of-the-art robotic picking system. Installed in our operations area, it speeds up the automatic picking of aerospace parts. This helps us to streamline the picking process, speed up the order process for our customers and relieves a lot of pressure on our busy picking teams.

The system also helps us with our quality control and inventory checks, which is extremely important to us. We use it to help us keep a close eye on what goes out of our warehouse. This way, we can make sure that all aero engine parts and other products meet our customers' exacting demands and comply with industry standards and safety requirements.

Has sustainability been a key consideration in the design and construction of your recent new facilities?

Sustainability and green working is very important to us. We are proud to have been awarded ISO14001 environmental management systems certification.

1. Opening the new UK HQ building
2. Solar panels on the roof boost the sustainability of the new UK HQ building
3. The new UK HQ building is in Brentwood, Essex

3





2

**“We are especially proud of our
£1.2 million, state-of-the-art
robotic picking system”**

This demonstrates our dedication to managing our impact on the environment and working to reduce the effects of climate change.

Sustainable working was a major part of the planning for our new UK HQ building. We have installed solar panels on the roof and electric vehicle charging points in the car park. In addition, we have built plenty of secure bicycle storage to encourage people to cycle to work.

Other green working initiatives that we have implemented in our new UK HQ include using reclaimed greywater for

flushing toilets and encouraging staff to reuse and recycle wherever possible. We have also switched to more eco-friendly packaging, reducing our reliance on plastics wherever possible.

There’s been some recent leadership changes in the organisation. How is this going to play a role in your continued growth?

We are very pleased to have strengthened our leadership team in recent months, in order to support our next phase of global expansion. We benefit from several talented, dedicated and ambitious senior leaders, who are working together to ensure the long-term future of Farsound and to grow our operations on a global scale.

Our former executive chairman Kevin Sargent has now been named non-executive chairman, while Chris Knott, previously group finance director, has been appointed chief executive officer for Farsound globally.

I have moved from my previous position as global sales director to become chief operating officer, overseeing our sales, quality and global operations, as well as the development of innovative products and services.

Jonathan Medhurst is our new chief procurement officer, responsible for global inbound supply solutions and supplier relationships.

How will you ensure the company continues to evolve in the future? What is your 10-year vision?

Farsound’s commitment to growth and global expansion is evident from the large investments of time, effort and money that have been made across our various international bases.

From our brand-new UK HQ building to the expansion of our facilities in Madrid, San Antonio and Toronto, we are dedicated to supporting our customers and growing our teams and capabilities in every possible way.

We intend to keep pace as the aviation and MRO sectors evolve. We are looking into how we can expand our offerings, including broadening the scope of parts that we can offer our aviation customers from only supplying aero engine parts, to branching out into other areas of aircraft fitting and maintenance. We are excited to see where the next 10 years will take us. 



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1. Farsound’s factory floor

2. The state-of-the-art robotic picking system

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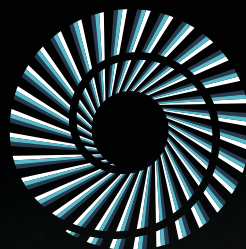


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FACING THE CHALLENGES HEAD-ON

A multitude of challenges are facing companies involved in the MRO sector, primarily relating to supply chain issues and labour shortages. But the sector is resourceful, as *Emma Kelly* finds out

1. An engineer at Lufthansa Technik Budapest

2. Ascent has a multi-faceted approach to supply chain issues



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The entire aviation industry is on an excessive growth path,” says Sven Taubert, head of corporate strategy and market analytics at Lufthansa Technik

(LHT). “The significant down-scaling during the crisis is creating major challenges in the current scaling-up phase,” he says, with the most prominent being supply chain disruptions and skilled labour shortages, as well as a recent addition involving new generation engines.

LHT is focusing on solutions for the resulting pain. Taubert says: “We have adjusted our stock of materials to buffer extended supply times for piece parts, we utilise our smart work scoping and repair methods, and seek opportunities from used serviceable material [USM].” He also adds that increased USM harvesting has improved its resilience.

Allen Neufeld, Ascent Aviation Services’ senior director of business development, says: “A lot of us were a little surprised by the increased demand. The downturn came quickly during the pandemic, but the process of deceleration is slow.”

The shortage of skilled aeronautical engineers is exacerbating and in some cases is directly contributing to global supply chain issues, he says. “The result is a shortage of key aerospace parts and logistical challenges that have caused lead times for some components to skyrocket, more than a year in some cases. A lot of buffers have been removed along the chain because no one is holding spares anymore, at least not like before.”

Ascent has a multi-faceted approach to supply chain issues, including risk assessment and management; understanding issues like fluctuations or raw material issues; contingency planning; diversifying the supply chain; and having back up suppliers for critical components, says Laura George, director of materials and purchasing, emphasising that strong supplier relationships, cooperation and communication are vital.

Supply chain issues are having a cumulative effect, increasing repair turnaround times, driven largely by manpower shortages and piece part/raw material production delays, says Mat Punter, AerFin’s vice president repairs. He says, “This in turn is resulting in a longer out of service time for component service providers and operators, resulting in increased stock holding to accommodate and to cover extended out of service time.”

Punter believes that 2022 and 2023 have seen unprecedented increases in

repair costs as OEMs seek to insulate themselves from increased production costs caused by global and local cost escalations, with contributory factors including energy and fuel price spikes, post-Covid recruitment driving up new employee salaries, national interest rate and inflation increases, and the impact of the Ukraine crisis. He says: “Future macroeconomic challenges at a national level will have far-reaching effects across the industry, therefore we must continue to work around the current challenges... and also take pre-emptive measures against future challenges.”

With some parts for new platforms having more than a 12-month lead time from OEMs, AJW has had to invest in increased inventory, says Scott Symington, chief commercial officer, AJW Group. He says: “By holding a larger stock pool, a company can provide a cushion against extended shop processing time, but one must have the size, scale and customer focus to make that investment.”

It is also crucial to have the right systems to monitor customer demands, trends, inventory, outstanding core returns and supplier shop performance in real-time in order to anticipate the market and deploy capital into the right parts, says Symington. “We have contracts with all the large component manufacturers and have layered in multiple third-party MRO suppliers to address vulnerabilities in the supply

“The entire aviation industry is on an excessive growth path”

chain,” he explains. AJW is also vertically integrating the supply chain by further developing repair capability in-house at its London and Montreal MRO facilities.

Like others, AAR is dealing with parts availability related to production disruptions, transportation delays and lingering pandemic effects, all creating shortages, delays and increased costs; supplier reliability issues created by a growing dependence on a limited number of suppliers; non-optimised inventory management stemming from improper ordering and stockpiling of parts, not having enough visibility into parts usage and real-time data; and the rising cost of raw materials, transportation and labour, according to vice president strategy, planning and innovation, Ryan Campbell.

He says: “Addressing these challenges requires a proactive and strategic approach. MROs need to diversify their supplier base, invest in digital technologies for improved visibility and predictive analytics, implement robust contingency plans for disruptions and engage in closer collaboration with key stakeholders to ensure a more resilient and efficient supply chain. AAR is doing this, developing solutions and partnering with external providers to improve inventory management, project variability in part usage and demand, and



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obtain deeper clarity into parts lifecycle using higher fidelity data.

AerFin's Punter says: “Inventory metrics and parameters are now further scrutinised and adjusted with even more insight and diligence to ensure maximum availability, utilising not just reactive statistics, but also industry insights and OEM updates to anticipate future challenges at a macro level.” AerFin is placing additional resources and focus on digital inventory solutions to ensure it always has available critical components.

To address labour issues, LHT's response includes leveraging training capabilities within its Lufthansa Technical Training subsidiary; opening a dedicated engine training and qualification centre in Hamburg; and adding 321 apprentices. It is also focusing on increasing the proportion of female project leads and managers to drive diversity.

Meanwhile, AAR is trying to grow the maintenance technician pipeline through its EAGLE Career Pathway Program; working to increase enrolments at airframe and powerplant schools; creating short credential programmes; and encouraging former military

technicians to transition through its Skillbridge partnership with Embry-Riddle Aeronautical University, explains Ryan Goertzen, vice president, aviation workforce development.

Challenges are not going away any time soon. AJW's Symington says: “We could be looking well beyond 2026 before we see an alleviation of this situation. By then, shop visits would have peaked, and a more regular situation will resume – these things are cyclical.”

“Gazing into my crystal ball, I estimate that the supply chain issues will continue for at least two years,” says LHT's Taubert, although labour issues will last much longer, especially in the US and Europe.

AAR's Goertzen sees the labour crisis tightening further as major airlines hire certificated technicians straight from school. He says: “This is almost unprecedented in our industry and shows just how challenging the hiring process has become.” And despite 14 new airframe and powerplant maintenance technician schools starting up in the US since 2018, the population remains relatively flat at 21,000 students.

“We do not have a capacity problem, we have an enrolment and willingness to grow problem that we must collectively work together and solve,” Goertzen says, highlighting the Choose Aerospace programme, launched in the US in 2020, which provides a high school curriculum designed to increase enrolments in

1. Ascent offers component removal, complete teardown and disposal
2. Scott Symington, chief commercial officer, AJW Group
3. Lufthansa Technik supports LEAP engine operations



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says Group Head of Information Technology SriLankan Airlines

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“Digitisation can provide significant knock-on benefits”

maintenance training. It operates in 26 high schools with 550 students, aiming for 10,000 students by 2027. Goertzen says the workforce challenge needs to be addressed nationally – regulations are needed to allow the smooth transition of military aviation technicians to FAA certificated technicians; and immigration must be encouraged in order to attract international talent.

AJW's Symington says while the industry is being challenged, it is driving change. “Aviation is always cyclical, and this has created a bubble for all solutions and parts suppliers, but the real positive for me is that AJW is now investing in digitisation to position itself to optimise efficiencies.”

Symington adds: “The ability to quote faster, have dynamic market pricing, improved inventory management, advance visibility of when and where a component is going to be removed, and then allow the customer to track the shipment in real time will allow us to offer levels of service that have a material improvement on our airline customers' operations.”

AJW's digitisation includes predictive maintenance to contracted power-by-the-hour customers, trialling RFID tags to track AOG shipments and developing a predictive inventory modelling system for rotatable components and a system to predict and manage consumables and expendables. At its Montreal



2

MRO facility, AJW is using dynamic forecasting using AI-supported digital tools that capture historical parts using information at the lowest level, allowing it to construct a detailed forecast using a macro-level demand forecast at a component level. Symington says: “We feed this data to our supply chain team to ensure parts are provisioned as early as possible in the process to build efficiency into shop processing time.”

Taubert says LHT has been at the forefront of digitisation, establishing its Digital Fleet Solutions unit in 2017 and launching the Aviator platform, combining fleet management solutions, data science and engineering expertise with digital services and products. This was followed by integration of flydocs, the digital records and asset solution, and Swiss Aviation Software's AMOS maintenance and engineering software, creating the Digital TechOps Ecosystem. LHT's Digitize the Core programme, combining Digital TechOps Suite with fully digitised core MRO processes, will allow LHT “to climb the next step of the MRO industry evolution ladder”, says Taubert.



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At AAR, initiatives planned to drive efficiency and increase productivity will “revolutionise how we conduct maintenance”, says Campbell, including potential applications for accessing maintenance manuals using a hands-free, voice-activated interface with intelligent decision-making augmentation.

Ascent is also on the digitisation path, with processes assisting in the diverse and complex daily flow of data. Neufeld says: “Ascent Aviation has begun a transformation in terms of adopting cloud-based system software to coordinate, monitor and improve all aircraft MRO processes, human resources management, sales and marketing activities and hangars, enhanced by analytics.”

Digitisation can provide significant knock-on benefits, says Ben Pinnington, AerFin's PMO director, pointing to the automation of repetitive tasks allowing staff to focus on higher value activities requiring critical thinking and expertise. He says: “This shift in focus can lead to increased innovation, improved decision-making and the development of more strategic initiatives.”

Digitisation also brings with it data privacy concerns and cybersecurity threats, but Pinnington adds: “Striking a balance between technological advancement while addressing the challenges is key to maximising the positive impact of digital technologies.”



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1. AJW HQ warehouse
2. Lufthansa Technik offers component support
3. Ascent provides disassembly, reclamation and EOL services



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Scott Butler, chief commercial officer
Ascent Aviation Services

ASCENT AVIATION SERVICES

A caring approach

Ascent's **Scott Butler** tells us about the company's approach to aging aircraft maintenance and entering the passenger-to-freighter conversion market



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1

What are the most common maintenance issues that arise with aging aircraft, and how does Ascent Aviation Services (Ascent) address these issues?

Corrosion is obviously the first thing that you want to worry about during a check. The older the aircraft gets, the more susceptible the aircraft is to having findings. The flying and maintenance environment is also a driver in this.

When inspecting an older airframe, we prioritise the open-up and inspection of structural areas to look for corrosion. The key to successful and on-time

delivery is finding the corrosion early, drawing up the engineering repair, and implementing the repair. Maintaining a strong core group of structure mechanics allows us to tackle even the most difficult repairs within the quoted time.

Additionally, having access to and knowledge of good supply chain solutions is especially crucial on older airframes, where unique material may not be stocked on AOG shelves. Our purchasing teams partner with several USM and other suppliers in the pre-planning phase in order to make sure we are ready for any parts issues.

To what extent is Ascent incorporating modern maintenance practices and technologies to enhance the operational longevity and efficiency of aging aircraft?

Our planning group is the lifeblood of our operation and we pride ourselves on being best-in-class in this regard. Having a task-by-task project flow and a scripted visit is key to delivering projects on time.

Once a project is awarded, our pre-planning phase begins immediately and our planning team works with project managers, project buyers, training and quality teams to ensure all our resources are aware of the project scope as well as any tasks that are known to produce a lot of non-routine findings.

Can you discuss any unique approaches or strategies Ascent employs for extending the lifecycle of aging aircraft to help optimise maintenance costs and minimise downtime?

Working and communicating with our customers in the pre-planning phase is key to ensuring we're aware of all the constraints. Once awarded the project, our planning team immediately begins to work with the customer's team to review the package together, discuss pre-draw material as well as review the previous maintenance records.

Even if Ascent did not perform the previous maintenance visit, we want to ensure we can review previous packages



2

“Maintaining a strong core group of structure mechanics allows us to tackle even the most difficult repairs within the quoted time”

to look for repeat issues and ensure we inspect troubled areas early in the check visit.

Having repeat customers' aircraft and aircraft types is important to successful TATs as Ascent becomes more and more familiar with the repeat inspections and can continuously improve our process and reduce span times where possible.

Is Ascent looking to position itself within the P2F market? What opportunities does the company see in converting passenger aircraft to freighters?

Ascent has recently announced a new commercial collaboration with Israel Aerospace Industries (IAI) to become the North American maintenance partner to convert 777-300ERs to cargo configuration. We have a long and successful history in widebody maintenance, which made the

300



The expected number of jobs across the 15-year programme between Ascent and IAI

programme a natural fit for Ascent.

To support this programme, we will erect two new widebody hangars at our Marana (MZJ) facility in Arizona. The pre-construction activities have already begun, and we have started to assemble our training programme with IAI to ensure we can begin the conversion in mid-2024.

Additionally, we have already begun the hiring process to support the

programme and we expect this 15-year programme will add more than 300 new jobs to the area. We are working with local schools and military bridge programmes and will begin our own structures training programmes to support the lead-up to the programme.

With the IAI STC on track to be received at the end of 2023, Ascent will be the centre of excellence for Boeing 777 maintenance in all of North America.

What key factors do you consider to be driving demand for P2F conversions, and how is Ascent aiming to capitalise on this market demand?

Aging airframes and new technologies are the key to the boom in P2F

1. Facilities housing aircraft parts
2. Ascent's one-stop-shop approach to aircraft types allows it to support an aircraft in all phases of its lifecycle



“Our purchasing teams partner with several USM and other suppliers in the pre-planning phase in order to make sure we are ready for any parts issues”

conversions. There is a large need to replace older airframes like the 767, 747 and A300 as there are no new production aircraft. The 777-300 is the logical replacement to these aircraft and there are nearly 1,000 aircraft under 20 years of age that will give excellent feedstock to the industry.

Additionally, new aircraft such as the 787 and A350 are quickly replacing the 777 in the passenger space as they have refreshed passenger experiences and have a much more efficient fuel burn.

Even prior to the IAI partnership, Ascent has positioned itself strongly in the 777 market and invested heavily in the tooling and training to accomplish the heaviest of checks on these airframes.

We will be a true one-stop-shop for the 777 where we can provide storage services, engine removals, landing gear changes, heavy checks, P2F conversions, and reclamation (USM) services on 777s. The IAI programme will now solidify Ascent as the premier provider of Boeing widebody services in North America.

1000

There are nearly 1,000 aircraft under 20 years of age that will give excellent feedstock to the industry

What distinguishing expertise and capabilities does Ascent offer that sets the company apart from competitors and attracts potential clients seeking aircraft conversion services?

We have a very diverse business base that allows us to work with all aircraft and customer types from around the world.

In addition to FAA, Ascent maintains certifications from multiple authorities such as EASA, TCCA, BCCA, CAACI, NCAA, ANAC, 2-Reg and Aruba that

allow us to support the transition of any type of aircraft.

Our one-stop-shop approach to aircraft types allows us to support an aircraft in all phases of its lifecycle.

We have extensive storage experience and capabilities which allow us to bring 777 aircraft down and send engines and landing gear out for overhaul while we're performing the heavy check and P2F modification.

We can offer a lot of flexibility for our leasing customers who will be retiring aircraft from one operator, entering into P2F conversion and delivering to a new operator in one smooth process. We are truly the centre of excellence in all aircraft transition services. 

▲ Ascent is one of the largest aircraft maintenance operations in the world



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In the wake of the Covid-19 pandemic, the aviation supply chain has grappled with numerous disruptions and delays. **Mario Pierobon** finds out from industry experts what the consequences are on the supply chain, the accompanying challenges and the emerging solutions



◀ An integrated drive generator (IDG)

According to Thomas Böttger, vice president of corporate purchasing at Lufthansa Technik Group, the aviation industry is currently experiencing a period of significant expansion: “All primary demand clusters of the global aerospace and aviation sector are simultaneously witnessing growth, on a global scale, with the production of flight hours for civil transport having returned to pre-Covid-19 levels.

“This strong recovery is accompanied by substantial pressure to increase production rates, driven by robust orders, across all relevant civil aircraft original equipment manufacturers (OEM),” he continues. “While the supply chain is consistently striving to increase output each quarter, it is important to acknowledge that some system OEMs are facing difficulties in keeping up with the rapid growth in demand, causing some delay in matching this upward trend.”

Clyde Buntrock, chief executive at AJW Aviation & Technique, agrees that the aviation sector is still grappling with persistent component shortages and supply chain disruptions following the fallout from the Covid-19 pandemic: “One of the main challenges it faces is extended lead times for components caused by the bullwhip effect on the supply and availability of skilled labour.

These, combined with a surge in demand for travel and record-breaking summer sales for airlines, have resulted in inefficiencies in forecasting inventory demand, which in turn impacts suppliers’ ability to meet their customers’ needs effectively.

“Furthermore, Brexit-related additional tariffs and increased border checks continue to adversely affect the supply chain, creating ongoing challenges, particularly for the UK cross border.”

The Covid-19 pandemic has significantly affected the employment landscape in the aviation sector, explains Buntrock. “According to government data, more than a third of aviation’s current MRO workforce is approaching retirement age, accounting for 35 per cent of employees aged 55 to 64. Some individuals have chosen early retirement in search of a better work-life balance, while others are making changes to preferred industries, workplaces and commutes in pursuit of a more balanced life. Others have even moved away from aviation into what they perceive as more stable sectors.

“Declines in aerospace personnel training and ongoing labour shortages are putting pressure on the aviation supply chain, leading to extended lead times for maintenance and repairs. The industry is actively addressing these issues and raising awareness of career opportunities to attract emerging talent into the sector, but progress remains slow.”

Impact on the supply chain

The current market circumstances are driving greater regionality in MRO sourcing, according to Buntrock. “OEM centres are sharing services across the globe to mitigate capacity constraints and working with customers and logistic partners to understand the supply chain vulnerabilities that exist and how to overcome them.

“OEMs and suppliers face challenges in their performance environment, particularly in terms of shop processing time (SPT), along with increasing costs of raw materials and labour. Manufacturers are producing new aircraft as quickly as they can, but this is being impacted, to a large degree, by slow component supply and workforce shortage.”

Component demand remains high, despite the cost-of-living crisis, but supply chain challenges are driving inflation in market prices for the most severely affected components. Buntrock says: “As these challenges unwind, the market prices should return to a more normal equilibrium level with lower volatility. This will facilitate a smoother path for airlines and other aviation industry organisations to meet customer demands as the industry continues to recover.”

To improve asset availability for customers, Lufthansa Technik has established multiple strategic directions. Böttger says: “We have adjusted our stock of materials to buffer extended supply times for piece parts, we utilise our smart work scoping and repair



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methods, and seek opportunities from used serviceable material (USM).

“Currently, the primary catalyst lies in our substantial in-house equipment repair capabilities, a facet we intend to strategically expand, since maintaining operations in-house affords us significantly heightened control over performance outcomes.”

OEMs are seeking collaboration with Lufthansa Technik to undertake smaller joint projects, says Böttger. “This creates mutual benefits both for the OEMs themselves, for the group organisation and for expanding the customer base. This collaborative approach subsequently ensures improved access to intellectual property (IP), allowing repairs to be undertaken in-house and alleviating the burden on their service centres.”



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Challenges and solutions

AJW Group has expanded its contracted services in both North and South America and there is also growing demand for additional EU-based locations and a potential increase in routes to the Americas. Buntrock says: “We are actively evaluating the competitiveness of our logistics providers and remain committed to working with strong global allies to consistently provide logistics support.”

According to Buntrock, industry stakeholders and partners must move together to find the best solutions to minimise disruptions, and AJW is exploring third-party supply options. He says: “We implement a pooling strategy by strategically positioning inventory across the world, which enables easy access and distribution to our regional customers.”

“Our inventory management and logistics solutions are tailored to meet the operational demands of our customers. To mitigate potential airfreight uncertainties, we are opting for more predictable and consistent airfreight routes to ensure reliable deliveries.”

Due to the overall growth in various sectors, all of which depend on the same

1. Single component maintenance
2. Every component matters
3. Clyde Buntrock, chief executive, AJW Aviation & Technique

“Perhaps the pre-Covid level of supply chain performance may not materialise until well into 2025, possibly even extending into 2026”

manufacturing capabilities, perhaps the pre-Covid level of supply chain performance may not materialise until well into 2025, possibly even extending into 2026, according to Böttger. He says: “The most important challenges currently faced concern the lead times associated with engine equipment and parts, as well as OEM reliability in terms of supplying new parts. Our cooperative initiatives offer potential avenues for addressing these challenges.”

“We have already started to build collaborative relationships with OEMs, and the central pillar of our collaborations is the initial dismantling of all trade barriers. This involves the removal of barriers such as access to intellectual property and the prohibition of approval policies of spare parts manufacturers (PMA). The main objective at this juncture is to perfectly blend the entire spectrum of technical capabilities and capabilities possessed by both partners, thus amplifying our overall productivity.”

From a technical point of view, experts regularly generate a multitude of innovative ideas in various sectors, according to Böttger. He says: “One noteworthy facet of our collaborative efforts pertains to forecast how many specific components, by part number (P/N), are required by the industry. It is imperative that we enhance the supply chain's efficiency and assist OEMs in optimising their operations by fostering improved and more precise predictions of our requirements.”

“This encompasses forecasting material demand, as well as projecting the volume of devices destined for supplier-based repairs. In essence, the general goal is to create a more precise and reliable demand forecasting system.” 

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Steve Vance, director of space, defence and intelligence, CGI



Emily Price, director of analytics, NATS

The power of AI/ML

NATS' **Emily Price** and CGI's **Steve Vance** explain how artificial intelligence (AI) is relevant to MRO, ahead of their presentation at this year's MRO Europe conference

Can you give us an example of how AI has been used within your part of the industry and how that has translated to benefits?

Emily Price: NATS' purpose is to advance aviation and keep the skies safe. We use the latest data and technology to do this – both for our operational teams in their 24/7 air traffic control service and by our corporate teams such as Analytics. We apply AI/ML to create sophisticated data models and insights which are used across our organisation and in products created for aviation customers to maintain safety and enhance service and environmental aspects.

Our analytical tools helped assess options and optimise the design for the 'West' UK airspace change introduced this year. This change was a major deployment of what's called 'free-route airspace', which reduces the number of 'point to point' connections, allowing aircraft to flow as freely as possible from their entry to exit points within UK airspace. As well as being a significant part of modernising the airspace structure, the change is predicted to save up to 150,000 nautical miles of flying per year through delivery

of more efficient routing by aircraft, with flight plans based on the new free-route principles. To put this into perspective, this one change is equivalent to saving the annual environmental emissions of 3,500 family homes.

Steve Vance: When CGI looked at this saving of 150,000 nautical miles per year enabled by NATS through this airspace change, and translated this to MRO costs per nautical mile quoted by organisations such as IATA, this results in a significant additional saving for MRO organisations also.

Can you share examples of any successful AI and ML integration in MRO through collaboration between CGI and MRO organisations?

Steve Vance: AI/ML can identify efficiencies and synergies using concepts such as linear programming or neural nets to harness the vast data processing and computation at a machine's disposal. This will revolutionise MRO by joining data across schedules, stock, engineering skillsets, asset performance and failure history.

The result is increased airframe and engine operation, reductions in operation/maintenance costs and improved customer experience as airframes and engines increase in reliability, safety and performance.

Additionally, less maintenance means fewer ferry flights to/from MRO facilities, helping organisations improve their carbon footprints while improving the life of components to their fullest potential thereby reducing consumption and waste. This vision will require integration of data securely and safely

40%



The integration of real-time aircraft data can improve the engine life of aircraft by up to 40 per cent

MRO Management: What AI and ML applications is CGI exploring to enhance MRO?

Steve Vance: CGI deploy artificial intelligence (AI) and machine learning (ML) approaches to enable cost savings and process efficiencies in many industries including the aerospace sector for clients such as Emily from NATS. The principal AI/ML value streams CGI are exploring in the MRO sector are focused at supporting decision making processes for airframe maintenance and scheduling, by predicting when an airframe should receive maintenance to increase airframe life and time on wing while reducing maintenance costs.

ML has been used for many years in MRO to better predict airframe failures. AI will move us to a realm where machines in partnership with humans will begin to enhance decision making, driving new efficiencies in scheduling and distribution of parts, engineers and airframes.



▲ NATS' purpose is to advance aviation and keep the skies safe

“Data availability, integration, expertise and legislation are all vital to consider when looking at AI/ML MRO strategy”

across an organisation and potentially over the air using satellite communication networks such as Iris.

This will enable machines to be trained and make decisions based on near-live asset information alongside MRO scheduling and organisation. By using these techniques, processing of these data sets will lead to more accurate operations by ensuring the MRO activity can occur when the right parts and engineers with the right skills are in the right location at the right time, driving lower cost and more efficient MRO for operators.

One of our partners worked with a multi-national aerospace and defence company to integrate real-time aircraft data with weather and historic failure data to train an AI model to predict the need of an airframe for maintenance.

This was integrated to parts and engineer availability data so that maintenance orders could be raised automatically and scheduled by the machine for human approval with a suggested maintenance task, engineer and location. This reduced the time to raise a maintenance request, the volume of maintenance visits and the overall efficiency of the MRO, extending engine life by up 40 per cent.

Is there anything stopping the industry in fully realising the potential of AI and ML in MRO, and how can obstacles be overcome?

Steve Vance: Data availability, integration, expertise and legislation are all vital to consider when looking at AI/ML MRO strategy. The data required to unlock the value of AI/ML is often distributed across siloed and incompatible systems and this can be a barrier. Systems need to be integrated cleanly for the machine to be trained and operated so as to unlock the benefit of AI/ML to MRO. Expertise can also be a barrier – AI/ML is a complex task requiring deep analytical skills in both AI concepts and data engineering.

Many organisations build AI models but do not put enough focus on how to productionise the end-to-end data chain required to turn an interesting model into a repeatable productionised and assured business process leading to a barrier to return on investment. Finally, legislation, especially in the aerospace sector, needs to be considered. The top priority will always be safety. Hence any potential use of AI would need to be explored, validated and ratified in partnership with regulators to ensure that the safety case

for maintenance activities is not in any way disrupted by the addition of AI/ML alongside the ‘human in the loop’.

How will NATS continue to utilise AI and ML for aviation's future?

Emily Price: Advancements in technology mean that our industry is evolving quickly, and airspace users of the future will bring a new set of challenges to the way airspace is managed. AI is already helping us design efficient future traffic flows and can help predict how to balance the varying needs of a new generation of airborne vehicles and customers. More generally, AI is prompting discussion about what tasks humans and machines are each best suited to and how to augment one with the other to enhance overall value, which I'm sure is very relevant to MRO.

Whilst MRO isn't something which my team typically considers, it's interesting to see how Steve's background has got him and CGI thinking about the excellent adjacent benefits our airspace change work has to MRO. As we look forward to a future with new types of airspace users, I fully expect AI to have an important role in designing their safe integration, as well as the intrinsic activities of these airborne vehicles and their associated MRO. 



Jake Costin, business development manager, Bii

Bii

Providing peace of mind

Bii's **Jake Costin** tells us that delivering on the service level expected during leasing interactions is critical to building relationships

MRO Management: What is your assessment of the leasing sector, and do the current service levels available meet requirements?

Jake Costin: Our approach is focused on supporting operators by providing them with access to flight-critical material. This provides multiple benefits to operators, including:

1. Leasing rather than purchasing, which frees up cash
2. Managing the exchange and repair process, freeing up operator resource and creating efficiencies
3. Repair and logistics expertise, ensuring maximum part availability and cost savings.

“We are always talking with our clients, monitoring their requirements and changing utilisations to ensure that we can provide for their adapting needs”

With our leased material we now cover more aircraft versus one year ago and are seeing higher usage levels as operations continue to recover and grow post-pandemic.

The struggles the industry faces around labour shortages and supply chain constraints are well documented, but have presented a very real challenge to our ability to deliver the service levels we have committed to.

Thankfully, our experience across logistics and repair management have enabled us to navigate this difficult backdrop.

We expect demand to grow alongside the growing active fleet, and so we are continually working to ensure we anticipate and mitigate any headwinds.

What organisations are currently in lease agreements with Bii, and what do these agreements entail?

We currently support a European charter operator with base kits at two sites in Europe. These kits cover a broad selection of the most used material, providing them the peace of mind that they can minimise aircraft on the ground (AOG) scenarios and maximise fleet operations.

Beyond the benefit of having immediate material access and Bii's repair management expertise, we are continually looking to deliver a service well above the framework set out within any agreement.

What level of interaction is there during a lease agreement, and how is this relationship nurtured?

When managing inventory and repairs, the level of engagement is generally high, especially during the peak periods of operation.



1



Delivering on the service level expected is critical to building the relationship. It is such a dynamic industry, however, and so we are always talking with our clients, monitoring their requirements and changing utilisations to ensure that we can provide for their adapting needs.

Furthermore, we monitor the ever-changing airworthiness landscape and assist to ensure their operation remains compliant with upcoming ADs/SBs in a timely and cost-efficient manner.

In what ways do you think Bii stands out from competitors in the leasing segment?

Outside of our materials leasing activity, we are investing in our lessor support business. We are working very closely with lessors on their aircraft maintenance checks, including providing on-site representatives to source parts and repair management.

This has been very well received by our current lessors as it drives cost

efficiencies and supports overall TATs – both of critical importance to lessors, helping them minimise aircraft downtime and maintenance costs.

We have found that providing on-site representation significantly improves the client experience – maintenance checks always throw up their unique challenges, so having people on the ground who can react in real time removes any delays in decision making and keeps processes efficient.

We very much see this as a strong area of growth given the growing number of lessors and MRO requirements over the course of this decade.

1 (Left to right) Joao Santana Jr and Carla Santana, technical representatives at Aircraftle with Guy Ayscough, head of sales at Bii



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TRUST IN TECHNOLOGY?

ST Engineering

How are organisations adapting to the introduction of robotics in the work environment? *Craig Waters* finds out

“It is still early days for robotics and automation in the MRO space, and this is the case for a few reasons,” says Nicole Tibbetts, chief engineer for MRO at GE Aerospace. “Unlike the automotive sector, which has many repetitive processes, the challenge in the MRO space is trying to automate process variability. Another challenge we face is that parts can become distorted in services, requiring us to observe the condition of a part before we start.

“In services, we start with cleaning and inspecting the engine before identifying and understanding what services to perform. To pave the way for robotics to be more utilised, GE Aerospace is investing in vision and digital inspection systems (replicating human sight) to inform the robotics solutions.

“Recent investments in digital inspection systems, for example, have allowed us to augment specialised certified skillsets (visual and FPI inspectors) by demonstrating that advanced camera systems and detailed probability of detection studies can be achieved consistently with the same visual acuity as a human eye,” Tibbetts continues. “This is a step change in a highly regulated industry such as aerospace. But as other technologies begin to mature, we’re also seeing more unique applications such as drones being deployed to do airframe external inspections that are traditionally time consuming and constrained by size, scale and access challenges.”

Lee Hui Fung, ST Engineering’s senior vice president and head of innovation and continuous improvement, commercial aerospace observes that “MRO robotics has been progressing

slower than other technologies such as digitalisation and data analytics due to greater complexity in implementation, higher investment cost as well as longer lead time towards implementation.

“Nevertheless, ST Engineering has embarked on robotic automation in various aspects of aircraft MRO from airframe, engines to components.” From their experience, Fung says the workshop environment is more conducive for the adoption of robotics as the conditions can be more controlled. She says: “For this reason, we have implemented more robotics solutions in our engine MRO operations. These include automated engine blade weighing, mapping and profiling, sealant injection and spray painting for engine MRO work, robotic

▲ Workers can be up-skilled to operate robots or automatic systems



1

drilling for freighter conversion and drones for aircraft inspection.”

Ivo Van de Put, head of new engines engineering at SR Technics, believes that mechanical robots are still a long way from being a fully integrated everyday process. “The sheer number of programmable and repeatable actions are simply too low to account for the current investments,” he says. “The accuracy needed for mechanical robots has a much larger benefit in new-make production than in the MRO industry at the moment.”

Van de Put says that robotic process automation is a trend where SR Technics can see the future for robotics utilisation: “Having a robot in place to identify, select, edit, transfer and implement data from one platform to another has been proven to yield excellent results in terms of speed, accuracy and sustainability.”

Help or hindrance?

“With the rate at which demand is growing in the MRO space and the limitations in a post-Covid workforce, the

application of robotics and automation drives both labour productivity in terms of total demand hours and accelerates learning demand curves with advanced skillsets,” says Tibbetts.

“More and more, as our industry is trying to become geographically diverse, robotics and automation can help standardise specific maintenance tasks that have historically been affected by variation in human interpretation. Another advantage is allowing employees to be removed from repetitive tasks that potentially expose them to injury or other health hazards and ergonomic challenges.”

Fung agrees that the main benefits of robotics are in improving productivity with consistent safety and quality standards. She says: “By streamlining and eliminating time-consuming, repetitive and menial work, robotics can free up precious manhours to focus on higher-value tasks such as analysis and process improvement.”

“MRO robotics also addresses the aviation industry’s challenges in

1. ST Engineering has embarked on robotic automation in various aspects of its services

2. Lee Hui Fung, senior vice president and head of innovation and continuous improvement, commercial aerospace, ST Engineering



2

ageing workforce and labour crunch by enabling senior workers to leverage their experience without having to perform the more physically demanding tasks. The application of robotics also entices the younger generation who are trained in new technologies during their course of education to join the MRO industry.”

Staff concerns

To address workforce concerns and facilitate collaboration between humans and robots, specific measures can be implemented.

Van de Put says: “When the process of implementation of robots is finished for the sole purpose of automating tasks, it is key to recognise the human potential of the workers it would replace. Companies which continuously invest in their human capital will see that putting their organisation through the automatisisation process does not pose a threat to their staff.”

“Early engagement of the workforce in process automation is key in addressing workers’ concerns of job displacement,” explains Fung. “Designing

“The application of robotics also entices the younger generation who are trained in new technologies during their course of education to join the MRO industry”

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1.Robotics can free up precious manhours to focus on higher-value tasks
2. Ivo Van de Put, head of new engines engineering, SR Technics

“For us, the focus is on how robotics can support our service engineers and enhance their productivity”

automation with workers’ input gives them the ownership and assurance of human involvement in the loop for robotics automation.”

Fung also believes that open communication and support from management is equally important when embarking on change management. “Provision of ample training, for example tapping on SkillsFuture programmes in Singapore, also prepares the workforce for a smoother transition as job natures are increasingly transformed. Workers with suitable capabilities and interest can be up-skilled to operate the robots or automatic systems while others could be re-skilled into different roles.”

“We have a service engineer-centric viewpoint when it comes to MRO,” says Tibbetts. “For us, the focus is on how robotics can support our service engineers and enhance their productivity. For example, in our MRO shops, we are now providing an Advanced Blade Inspection Tool (BIT) for the GENx Engine, as part of an on-wing inspection kit through OC Robotics, that is enabling faster, more accurate inspection assessments for GENx engines using

artificial intelligence (AI) technology. With this robotics tool, the AI guides the selection of images for technicians to inspect to ensure the right comparisons are made. This is similar to how AI is used to help doctors review X-rays of patients to spot lung cancer. Overall, using the BIT tool versus the standard Borescope Inspection (BSI) reduces the processing time from three to 1.5 hours.”

Adapt and embrace

To ensure continued trust in robotic systems as technology advances, it will be essential for organisations to provide appropriate forms of support.

Fung says: “Robotics systems are here to stay, and they will increasingly become a norm in MRO work. It is hence important that all levels of an organisation recognise that and learn how to adapt to the evolution of the work environment. This involves the management continuing to invest in MRO robotics; engineers and specialists incorporating the latest robotics technologies into work processes; and the general workforce learning to accept, use and work side by side with robotic systems.”



Van de Put says: “SR Technics, as an MRO provider, deals with people as its customers. The aviation industry relies heavily on the development of safety management systems and technical data to ensure safe air travel. Such development has been transferred from an operational to a management and even strategic level. Such paradigm shifts in safety management require human assessment and implementation to be effective and sustainable. Where robots can be used to materialise on this, the industry will surely assess its benefit.”

Tibbetts concludes: “We have a robust quality system and process to ensure that our parts meet fit, form and function. Using robots to deploy these processes provides an opportunity for additional control beyond material sampling. And once you have a robotics application, you can standardise these repair processes for more consistent yields and product safety.” 



Malcolm Chandler, head of commercial and marketing, Vallair

MINIMISE WASTE, MAXIMISE VALUE

Vallair's **Malcolm Chandler** says aircraft recycling and waste control is important for industry sustainability goals

Vallair is a founding member of AFRA and we part-out both Vallair owned assets, as well as aircraft for third party customers. Our disassembly facilities cover ATR, B737, A320 and A330.

Aircraft recycling is a growing business sector for us, driven by the demand for quality used parts to enter the circular economy, and as part of the aviation industry's pledge to accomplish net-zero by 2050.

Materials removed from the aircraft are separated as recyclable or non-recyclable, and the airframe is deconstructed whilst guaranteeing safety, environmental protection and

cost optimisation, as well as leaving the ground fit for reuse.

With two disassembly locations in France, Vallair is in a niche position in Europe because our disassembly hangars, EASA/FAA approved aerostructures facility and paint shop are co-located with our aircraft MRO division. For lessors seeking to transition aircraft with a minimum of downtime this offers a great one-stop-shop, and third parties looking for comprehensive teardown and on-going parts management will be reassured to know that we will also have AFRA approved engine disassembly on-site soon.

Parts are recycled within Vallair, both for aircraft undergoing maintenance at our MRO facilities, or for those parts stockists that send removed units to us for full repair/overhaul. We also offer warehousing for parts which avoids unnecessary transportation if the unit

does not have an immediate customer requirement, reducing truck/air movements and ensuing CO₂ emissions.

Forecasts for the part-out industry for the remainder of 2023 and into 2024 are mixed. Demand for USM is greater, as several models of older aircraft which would normally be retired are being retained for operational duties because of the delays related to new aircraft due to enter service.

However, the availability of feedstock aircraft to dismantle is limited – simply because several models of desirable aircraft are flying longer. That said, we have already seen the teardown of the first Boeing 787-8s this year; proof that age alone is not an exclusive reason for reducing an aircraft to its individual components.

At Vallair, we see evidence of effective recycling and waste control becoming a prerequisite of aircraft OEMs, operators or lessors seeking partners to undertake aircraft maintenance and modification programmes on their behalf. This goes far beyond a 'lip service' request and this commitment to sustainability and best-practice will only increase across the entire industry.

During the part-out process, Vallair frequently receives unusual requests for alternative usage of large aircraft parts. Requests have included cockpits for keen flight simulator buffs, fuselage sections for crew training, complete fuselage for conversion to restaurants and business class seats for home cinemas. There's also a growing demand for quirky furniture manufacture including boardroom tables made from wing sections, occasional tables, lamps and much more. 

“Vallair frequently receives unusual requests for alternative usage of large aircraft parts”



◀ Awaiting teardown at Vallair's MRO facility in Montpellier, France

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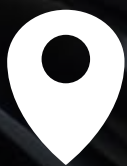
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