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MRO

Management

A changing landscape

Exploring the regional
aircraft MRO market
p.40

ONE-STOP-SHOP
A look at the impact of
Embraer's OGMA plant
p.26

LEGAL MATTERS
Remote Authorised Persons and
Canadian aerospace growth
p.20

INDUSTRIALISING REPAIRS
How GE is improving the
lifecycle of parts
p.34



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Editor's Letter

Regional aircraft require multiple flights per day to maximise utilisation, so therefore will predominantly operate shorter flights. However, this puts greater stress on the airframe and necessitates closer monitoring for airworthiness.

While some regional airlines handle their own maintenance, many others decide to outsource the activity to specialist suppliers.

In our cover feature, concerns are expressed about the common issues faced by MROs across regional jets, including workforce shortages, supply chain problems and a lack of spare parts leading to congested facilities and increased turnaround times.

However, to address these challenges, aircraft OEMs are expanding their component support and hourly rate programmes to retain existing customers and attract new ones. Examples include Embraer's Pool Programme, de Havilland Canada's Component Solutions Programme, and ATR's Global Maintenance Agreement, while companies like Magnetic Group and Fokker Services Group are continuing to support regional aircraft fleets through services such as parking and storage maintenance, interior upgrades and modification projects.

New inspection technologies, digital MRO activities and the use of big data are gaining more attention to help lower costs and reduce turnaround times in regional aircraft MRO.

It will be interesting to see how regional airlines will continue to adapt to the changes of the MRO landscape and the impact this will have on aircraft utilisation, reductions in downtime and reduced costs.



▲ One of Finnair's fleet of ATRs which are maintained by Magnetic MRO

If you're not already aware, *MRO Management's Predictive Aircraft Maintenance (PAM) Conference* is back this year, taking place from 27-28 November in London.

We've expanded PAM into a two-day event for 2023 so that the agenda can cover a broad range of topics including the legal, regulatory and sustainability issues related to predictive aircraft maintenance. You can find more event details on page 18, and we hope to see you there.

As always, I hope you enjoy reading this issue and please do get in touch to share comments or even send in details about your latest projects to be considered as features in our upcoming issues.

Craig Waters

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Contents

JULY 2023



6 Hangar talk

The latest industry news

12 Trend watch

New partnerships, solutions and initiatives are driving innovation

14 Paris Air Show 2023 review

A round-up of some of the deals signed at the 54th Paris Air Show

16 Industry voices

WAI's Kelly Murphy on the importance of diversity in the workplace

18 PAM Conference 2023

Get ready for the Predictive Aircraft Maintenance conference

20 Legal matters

Exploring the development of remote authorised persons in the Canadian aerospace industry

26 Embraer MRO services

How OGMA is becoming a bigger cog in Embraer's wheel

30 Supply chain software

Unravelling the complexities of aviation MRO and the role of software

34 GE engine maintenance

Kevin Rozario reports on the uptake of industrialising repairs

40 COVER FEATURE

Regional aircraft MRO landscape

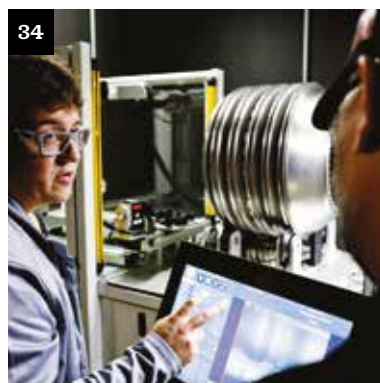
Bernie Baldwin explores the latest developments in regional aircraft maintenance

46 Hangar design & construction

How sustainability is playing a part in the design and construction of hangars

50 Green sky

ecube's Lee McConnellogue explains the organisation's secondary first approach to component reuse



Hangar Talk



REPAIR LINES

ATC to take over refurbishment of Singapore Airlines' cabin components

➤ The Agency for Science, Technology and Research (A*STAR) and Applied Total Control Treatment Pte Ltd (ATC) have announced the completion of a technology transfer which enables ATC to take over the repair line for the refurbishment of Singapore Airlines' (SIA) cabin components.

It will allow SIA to integrate sustainable practices into its MRO processes by adopting a repair and reuse strategy.

Under the joint laboratory established by SIA, SIA Engineering Company (SIAEC) and A*STAR's Singapore Institute of Manufacturing Technology (SIMTech) in 2019, A*STAR's SIMTech has developed repair process

methodologies that are designed to recoat surface-damaged copper trims.

This has enabled SIA to be able to significantly reduce the amount of waste generated from discarded copper trims and improve the lead time for their replacement.

More than 2,000 repaired trims have been delivered to SIA and SIAEC through the pilot repair line and, according to laboratory test results, the repaired trims are 50 per cent more durable.

The repair line has reduced the lead time for replacement from the six months needed to procure Original Equipment Manufacturer (OEM) parts for replacement to just three weeks for repairs, using the new technology.

In addition to the 2,000 repaired copper trims, ATC also delivered more than 3,000 copper trims to SIA with zero rejection rate.

Marcus Sia, managing director of ATC, said: "This new technology will complement ATC's deep expertise in metal plating and finishing as we seek to grow our business, having moved to our new plant. We are also excited to be a qualified vendor to our national carrier, SIA, and also add value to the local aerospace MRO ecosystem."

"ATC also delivered more than 3,000 copper trims to SIA with zero rejection rate"



FACILITIES

NetJets opens new maintenance service hub in Paris

➤ Private aviation leader NetJets has opened its Le Bourget Maintenance Service Hub, providing a 24/7/365 maintenance facility to all current NetJets Europe aircraft models.

Christian Luwisch, NetJets Europe's executive director, said: "As we continue to expand our fleet across Europe, it is imperative that our operations that keep our aircraft airborne expand at the same rate to ensure our owners can continue to fly."

The service hub hangar covers 4,014 square metres with the addition of a 11,329 square metre ramp area, meaning it can house the fleet's largest aircraft models, including Bombardier's Global 6000 and Challenger 650.

NetJets states that as the facility becomes more established in the coming months, there is scope to enhance the number of aircraft being serviced daily due to the ample capacity of the hangars.

AIRCRAFT

ExecuJet completes Falcon aircraft heavy maintenance

➤ ExecuJet MRO Services Malaysia (ExecuJet) has completed back-to-back maintenance checks at its facility at Subang Airport on Dassault Falcon aircraft, including Falcon 2000EX, Falcon 900LX, Falcon 7X and Falcon 8X.

Ivan Lim, regional vice president Asia at ExecuJet MRO Services, said: "Our status as the region's major Dassault MRO facility is driving new demand.

"The customers appreciate that our engineers and technicians are trained by Dassault, coupled with our regional experience for which we have numerous testimonies from clients over the years."

From pre-purchase inspections to scheduled inspections, ExecuJet has expanded its Falcon service activities. In a recent case, the service centre repainted the livery and refurbished



the cabin of a Falcon 8X, combined with scheduled heavy maintenance work to optimise ground time.

Lim continued: "With the increasing number of Falcon aircraft in Asia, we are witnessing a surge in demand for line and base maintenance work as well as pre-purchase inspection work."

BRIEFS



- Hawaiian Airlines has chosen SIA Engineering Company Limited (SIAEC) to perform airframe maintenance services for its fleet of 18 A321neo aircraft. The activity will take place up to 2027 at SIAEC's facilities in Clark, Philippines, and cements a long-standing engineering partnership between the two organisations.

- Set to open in autumn 2024, a new aviation maintenance, repair and services hub called the Mid-Atlantic Opportunity Park has been hailed as a transformative project for the Southern Alleghenies region. A 100,000 sq ft facility will be central to the Pennsylvanian site, with additional retail space for parts suppliers, paint shops and distribution facilities.

- Aircraft investment specialist Stratos has completed the delivery of two widebody aircraft. The first was the sale of an A330-300 MSN1338 to an affiliate of DHL. The second was a 777-300ER MSN39232 delivered to a major carrier in the Middle East in a transition from Cathay Pacific.

- Aerospace logistics company B&H Worldwide has signed a two-year extension on its agreement to manage inventory for AerFin, the end-of-life aircraft and engine experts.

- Integrated support specialist Vallair has completed the full teardown of two A320s (MSN 2372 and MSN 2393) on behalf of aftermarket part supplier SETNA iO. The stock will boost USM availability of these core parts throughout SETNA iO's global stock hubs.

2k

The amount of extra square metres added to Magnetic MRO's facilities with the opening of its new hangar in Tallinn

18

The number of Hawaiian Airlines' A321neo aircraft that SIAEC will provide airframe maintenance services for

\$890k

The value of scholarships announced during the Women in Aviation International 2023 conference in Long Beach, California



FACILITIES

Magnetic MRO's new hangar boosts maintenance capacity

➤ Magnetic MRO's new hangar in Tallinn is set to increase its line maintenance capacity by 40 per cent.

The new hangar provides an additional 2,000 square metres of space to Magnetic MRO facilities, enabling it to handle a wider range of line maintenance projects such as A-checks, RTS, landing-gear and engine changes, and modifications.

Moreover, heavy line maintenance work can now increase by 30 per cent with the availability of this new facility.

The hangar was constructed due to the increasing demand for base maintenance

services, which usually require longer turnaround times and occupy most of the existing hangar space. As a result, it limited the amount of slots remaining for line maintenance operations.

Kaspars Podins, head of production of Magnetic Line, said: "With the infrastructure in place, we are expanding through the increase of line maintenance production capacity and overall service portfolio.

"This new hangar is definitely a rational alternative to a standard MRO hangar. The construction is lightweight and durable, considering applicable wind speeds and snow loads."



ENGINES

Rolls-Royce and AFI KLM E&M ink Trent XWB agreement

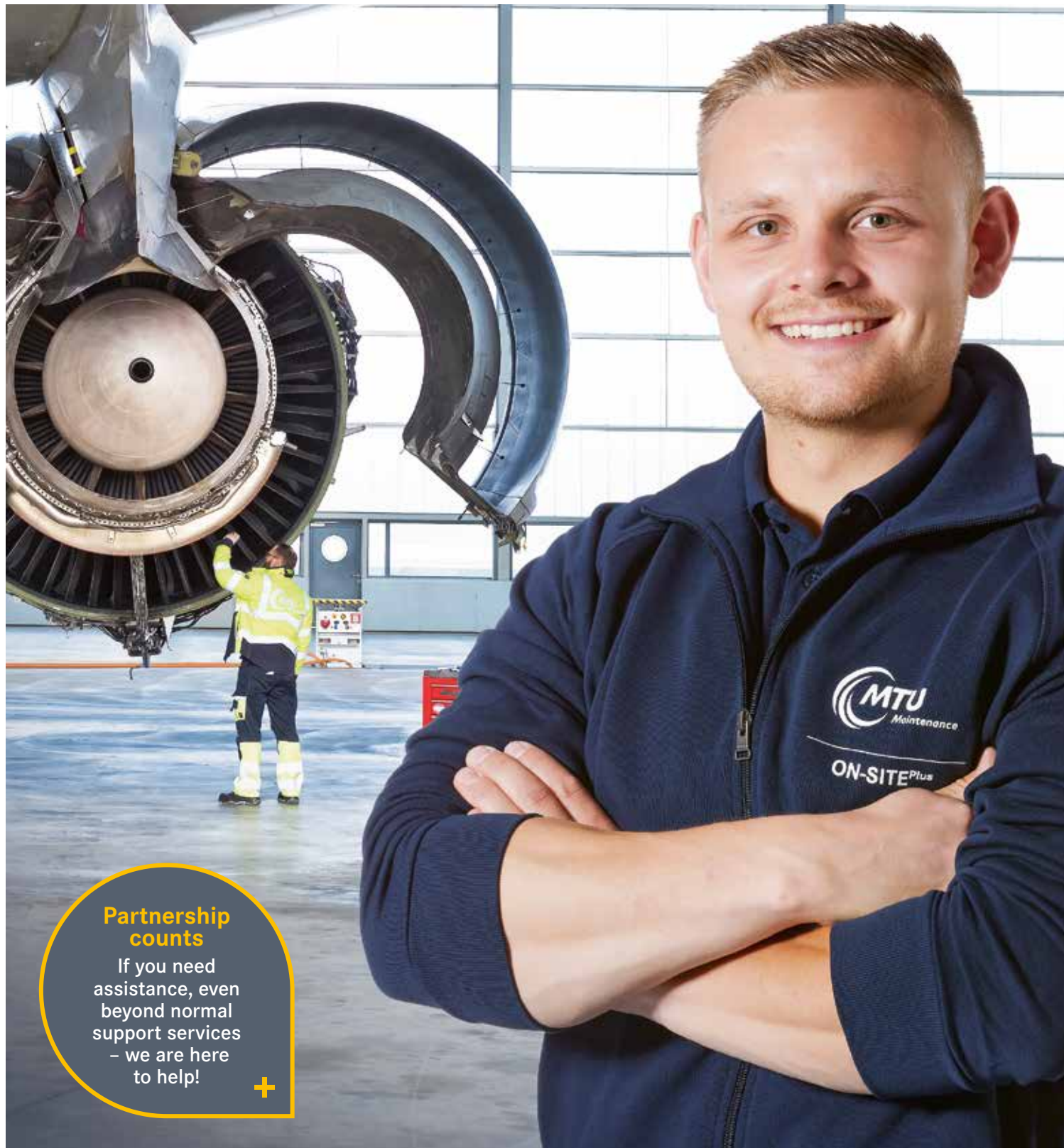
➤ Air France Industries KLM Engineering & Maintenance (AFI KLM E&M) has signed an incremental agreement with Rolls-Royce for the maintenance and repair of the Trent XWB – the exclusive engine used to power Airbus A350 aircraft.

AFI KLM E&M will set up full maintenance capabilities for the engine type covering its entire lifecycle.

The agreement builds on a previous 2014 agreement between the two groups as part of Air France-KLM Group's acquisition of the Airbus A350 aircraft.

This new agreement falls in line with the Airline-MRO strategy deployed by AFI KLM E&M, which is based on the continuous development of industrial capabilities in order to support its parent fleets and worldwide operators.

Dominic Horwood, services director at Rolls-Royce Civil Aerospace, said: "AFI KLM E&M joins our expanding global network as a valued partner with a long heritage of MRO experience that will enhance our overhaul and repair capabilities for the Trent XWB-84 engine."



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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 structure. 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 nearby. The setting is a vast, brightly lit industrial facility with a high ceiling, white structural beams, and yellow overhead conveyor systems. The overall atmosphere is one of a high-tech manufacturing environment.

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TREND WATCH

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



01

SERVICE SUPPORT

● National Jet Express (NJE) has signed a contract extension for Embraer's Pool Program to support the Australian charter airline's six E-190 jets.

The programme allows airlines to minimise upfront investments in high-value repairable inventories and resources, while taking advantage of Embraer's technical assistance and component repair service provider network.



05

MRO ENGINE SERVICES

● StarFlyer and Lufthansa Technik has signed a long-term contract for engine MRO services for the airline's Airbus A320ceo and A320neo fleets.

Lufthansa Technik will provide the Japanese airline with comprehensive technical support for CFM56-5B and LEAP-1A powerplants into the next decade, further expanding its customer base for the modern LEAP engine in Asia.

StarFlyer's Toshihiko Noguchi said: "Lufthansa Technik has been an important partner for us to support our reliable operations of A320 fleet since March 2006 when we started our flight operations."

"Lufthansa Technik has been an important partner for us to support our reliable operations of A320 fleet since March 2006"

02

ENGINE SUPPORT

● Philippine Airlines (PAL) and Air France Industries KLM Engineering & Maintenance (AFI KLM E&M) have announced a support agreement to cover 32 CFM56-5B engines that power the airline's fleet of Airbus A320ceo aircraft.

AFI KLM E&M will undertake a wide range of work scopes on the CFM56-5Bs, both in-shop and on-site.

PAL will receive a support package to emphasise asset availability and cost optimisation, through tailored work scopes designed specifically for the CFM56-5B.



03

FLEET MAINTENANCE

● Magnetic Group has extended its maintenance contract with Finnair for the airline's ATR and ERJ aircraft fleet in Tallinn.

Magnetic Line will carry out routine overnight checks for the Finnish flagship carrier's Embraer aircraft and perform one-year checks for its entire ATR fleet.

The two companies started working together four years ago when Finnair entrusted its entire ATR 72 fleet to Tallinn for aircraft painting and complete passenger cabin refurbishment.

04

MAINTENANCE SUPPORT

● Swiss-AS has partnered with Croatia Airlines to implement its AMOS software solution. The platform will support the airlines' strategic fleet renewal into an all-new A220 fleet by 2026 by offering powerful capabilities for aircraft phase-in and out.

The system's intuitive workflow will enhance productivity and maintenance activities.



Trending stats

200

Number of JetBlue components that AFI KLM E&M will provide support for (from Paris Air Show Review feature, p14)

17,000

Number of components ecube placed back into the aviation supply chain this year (from Green Sky feature, p50)

18

The number of Hawaiian Airlines' A321neo aircraft that SIAEC will provide airframe maintenance services for

610,000

Estimated number of newly qualified maintenance technicians needed according to Boeing's Pilot and Technician Outlook (2022-2041) (from Industry Voices feature, p16)

06

SUPPLY CHAIN SOLUTIONS

● Farsound has renewed its supply chain solutions partnership with Iberia.

Farsound will provide advanced kitting solutions directly to Iberia's assembly lines, ensuring all required parts are sent to a single point of use.

The service will fit seamlessly with Iberia's own supply chain and workflow.

Farsound recently opened a new facility in Madrid which was built for the purpose of quickly servicing Iberia's fleet.



08

SAF

● A tool designed to monitor and forecast the capacity of sustainable aviation fuel (SAF) over the next decade has been launched by Boeing.

Its purpose is to enable analysis of the existing SAF footprint and project future production levels necessary to achieve the commercial aviation industry's target of net-zero emissions by 2050.

The dashboard aims to facilitate discussions and actions among industry stakeholders.

07

INVENTORY MANAGEMENT

● B&H Worldwide has been awarded a two-year extension to manage inventory for AerFin, the end-of-life aircraft and engine experts.

B&H will support AerFin's fast growing expansion by providing storage and 3PL solutions in Singapore and Australia.

Demand from its customers over the past decade has fuelled AerFin's international expansion and scope of services to manage in-house engine disassembly, storage and distribution of aviation inventory.



PARIS AIR SHOW 2023 REVIEW

A round-up of some of the deals signed at the 54th Paris Air Show in June which returned for the first time since the Covid pandemic

MRO

First US A220 contract for Air France KLM E&M

Air France Industries KLM Engineering & Maintenance (AFI KLM E&M) secured its first US A220 MRO contract.

The multi-product provider will deliver US lowcost carrier JetBlue with full support for over 200 components.

JetBlue has ordered 100 of the new-generation narrow-body aircraft from Airbus to replace its Embraer 190 fleet and support its current A320 route structure.

The new MRO deal covers repairs, provision of on-site stock and access to a pool of A220 Inventory.

Barfield, AFI KLM E&M's North American affiliate, will manage the delivery of these services and provide JetBlue with local support.

Gregg Brown, vice president technical operations at JetBlue, said: "The solutions provided by AFI KLM E&M offer a solid balance of proximity, economic efficiency and operational reliability.

"We are very happy with the support the group provides us and are confident this will continue with the A220 fleet."

The partners described the deal as a "new chapter" in their relationship. Barfield has supported the New York-based airline's A320 family of aircraft for a decade.

AFI KLM E&M said its team has "cultivated dual technical and operational knowledge" of the A220-300 aircraft and its systems, "essential in deploying reliable and competitive MRO solutions".

"AFI KLM E&M brings the ability to integrate solutions to address real-world challenges. This agreement was designed with this in mind and contributed to AFI KLM E&M's selection as JetBlue's business partner," it added.



1

APU SERVICING

Air Austral pens APU deal with EPCOR

Réunion Island-based French airline Air Austral and AFI KLM E&M extended their partnership through a new A220 agreement with subsidiary APU specialist EPCOR.

The latest deal covers the repair and servicing of APUs (GTCP131-9C), replacement unit supply and access to AFI KLM E&M's predictive maintenance solutions via Prognos.

Vincent Guérin, technical director at Air Austral, said: "The technical relationship built up between AFI KLM E&M and Air Austral over the years provides us with invaluable reassurance.

"We know and appreciate the quality of their services, the robustness of their solutions and the availability of their teams."

Heidi Haveman, managing director of EPCOR, added: "We're delighted about Air Austral's confidence in our expertise, as the airline becomes our first external customer for the A220."



2

ELECTRONIC PROPULSION

Safran and AURA AERO sign ERA agreement

Safran Helicopter Engines and AURA AERO signed an agreement to collaborate on developing next generation Electric Regional Aircraft (ERA).

As part of the agreement, the partners will work on solutions to integrate turbo-generators developed by Safran for use in the 19-seat regional aircraft.

It is due to take its maiden flight in 2026 and expected to enter into service in 2028. Letters of intent have already been signed for several hundred aircraft.

The motorisation project partnership follows a first agreement, signed in 2022 between AURA AERO and Safran Electrical & Power covering electric equipment of the aircraft.

A turbo-generator comprises a gas turbine and one or several electric generators that regulate pressure, as well as an innovative system regulating power and electric tension.

Safran Helicopter Engines has bench-tested several types of turbo-generators, at different levels of power.

Florent Chauvancy, head of sales at Safran Helicopter Engines, said: "Becoming a partner of AURA AERO is great news for Safran Helicopter Engines. We share the same will to decarbonise air



“THE DHC-6 CLASSIC 300-G WILL DELIVER INCREASED PAYLOAD RANGE AND DECREASED COSTS”



transport and we are ready to bring them our expertise in hybrid-electric propulsion, developed through many tests.”

COMPONENT MANAGEMENT

Croatia Airlines agrees Dash 8-400 maintenance deal

Croatia Airlines agreed an MRO deal with De Havilland Canada for its fleet of six Dash 8-400 aircraft. The partnership also provides access to De Havilland Canada’s strategically located exchange pool.

Leighton Storsley, De Havilland Canada vice-president, aftermarket and business development, said: “We are delighted to welcome Croatia Airlines to our De Havilland Component Solutions Program.

“Our highly customisable DCS Program allows businesses to focus on their key business objectives, while we take care of their component management needs.”

Jasmin Bajić, Croatia Airlines president and chief executive, added: “The DCS Program offers the cost predictability that is so important in airline management.

“We look forward to benefitting from access to De Havilland Canada’s expertise in warranty administration, planning and supplier management to enhance the operations of our Dash 8-400 aircraft.”

AIRCRAFT LAUNCH

De Havilland takes iconic DHC-6 to new heights

De Havilland Canada launched its new DHC-6 Twin Otter Classic 300-G which has purchase agreements and letters of intent for 45 aircraft.

Brian Chafe, chief executive, said: “For over 50 years, the DHC-6 Twin Otter has stood alone as the most reliable and versatile aircraft in its class.

“After extensive consultation with our customers, we are poised and proud to take this iconic aircraft to new heights with the new DHC-6 Twin Otter Classic 300-G.”

“With the same rugged airframe, propelled by Pratt & Whitney technology, the lighter weight Classic 300-G will deliver increased payload range and decreased operating costs for our customers.

“Along with an all-new cabin interior and flight deck featuring the Garmin G1000 NXi fully integrated avionics suite, De Havilland Canada is once again driving the utility transport aircraft market forward.”

GTF MAINTENANCE

Condor and Pratt & Whitney EngineWise tie-up

German leisure carrier Condor finalised an EngineWise maintenance agreement with Pratt & Whitney.

The deal covers the carrier’s fleet of 41 GTF-powered Airbus aircraft including 13 A320neos and 28 A321neos.

Björn Walther, chief financial officer at Condor, said: “GTF-powered aircraft will provide an exceptional combination of economic and environmental benefits for our business and passengers.

“EngineWise services will provide the insights we need to optimise the efficiency of fleet and operations, to support our ambition to enable responsible, and at the same time comfortable, travels with significantly reduced carbon emissions, lower fuel consumption and less noise.”

1. Condor and Pratt & Whitney tie-up EngineWise agreement

2. The AURA AERO is due to enter service in 2028

3. The DHC-6 Twin Otter Classic 300-G

4. AFI KLM E&M secure first US A220 MRO deal

SUPPORTING THE NEXT GENERATION

Kelly Murphy, Women in Aviation International's director of communications looks at the five common benefits of diversity in the workplace that can improve an organisation's performance



“As part of WAI’s robust scholarship programme, a variety of aircraft maintenance scholarships are offered every year to its members”



Kelly Murphy, director of communications, Women in Aviation International (WAI)



For more information on Women in Aviation International (WAI), visit wai.org

At Women in Aviation International (WAI), we are dedicated to investing in our current and future workforce that represents women of all ages and backgrounds in a variety of aviation and aerospace career fields and interests. We focus on developing an inclusive and sustainable industry that inspires girls to learn about all the career options in our industry.

WAI has created hundreds of annual Girls in Aviation Day events around the world and established Aviation for Girls year-round youth programmes. These resources are tailored for girls, ages 8-18. Through a dedicated Aviation for Girls app, WAI reaches girls internationally wherever they live and learn. There are hundreds of hours of positive female role model videos, tours of aviation museums and airports, hands-on activities and aviation book recordings – all designed to spark that interest in the minds of young learners.

Supporting the next generation is a key pillar of the WAI mission. Another way we can achieve this goal is by reducing the financial barriers that exist in this industry. Since 1995, WAI has awarded more than \$15.4 million in scholarships in aerospace engineering, aviation maintenance, aviation manufacturing skills, dispatch, flight training, helicopter ratings and general career enhancement.

During our annual conference, these awards are presented to deserving WAI members – with nearly \$890,000 in scholarships announced during WAI2023 in Long Beach, California.

As part of WAI's robust scholarship programme, a variety of aircraft maintenance scholarships are offered every year to its members. These financial resources help to spur the next generation of female aircraft technicians to fill both current and long-term demands.

Diversity in the workplace is a must

Several notable studies underline how diversity in the workplace can improve an organisation's performance. While measuring the impact of diversity, equity and inclusion (DE&I) programmes isn't always straightforward, research indicates there are five common benefits.

Number one: diversity increases productivity. A more productive

\$15.4
MILLION



Since 1995, WAI has awarded more than \$15.4 million in scholarships in aerospace engineering, aviation manufacturing skills and maintenance, dispatch, flight training, helicopter ratings and general career enhancement.



◀ Kaylee Spencer won two scholarships at the WAI2023 conference. She is one of WAI's four 2023 winners of the WAI Aircraft Maintenance Technician Scholarship, and the winner of the 2023 Envoy Air Future A&P Mechanic Scholarship

“WAI focuses on developing an inclusive and sustainable industry that inspires girls to learn about all the career options in our industry”

➤ Boeing's Pilot and Technician Outlook (2022-2041) reports there is a long-term demand for newly qualified aviation personnel for 602,000 new pilots, 610,000 new maintenance technicians and 899,000 new cabin crew members. This workforce will be needed to fly and maintain the global commercial fleet over the next 20 years

workforce translates to higher profits. And diverse teams tend to be more creative and better at problem-solving.

Number two: DE&I builds a positive organisational culture. Diversity is just one part of the equation. Equity and inclusion are important too. Together, they build a strong organisational culture.

Number three: organisations with policies and practices that support diversity increased innovation revenue by nearly 13 per cent. A collective creative power helps your organisation by sparking innovation.

Number four: employee retention rates increase if they feel accepted and relate to the organisation's culture. If an organisation is inclusive, it is more likely that employees will enjoy working there and want to remain with the organisation for a long time. Also recruiting not just entry-level staff but also leaders from diverse backgrounds helps to shape an inclusive company culture.

Number five: diversity in an organisation helps to better serve your customers, clients and constituents. We are a diverse population, with women representing 50 per cent of the world's population. Gaining that understanding better positions your organisation to create programmes and projects that can meet your community's interests and needs.

WAI remains committed to creating an industry that is equitable and inclusive. Our WAI2024 scholarships will be available online in July and are available to all WAI members. Check out all the numerous opportunities at www.wai.org/scholarships and chart a new course for your aviation career. 📖

➤ At WAI2023, WAI presented a range of maintenance-related scholarships from Air Wisconsin, American Airlines, ATP, Delta Air Lines, Envoy Air, EPIC Flight Academy, Pratt & Whitney Engines, Southwest and the WAI Aircraft Maintenance Technician Scholarship (OSU Grant). The full list of winners can be viewed at wai.org/2023-scholarship-winners



PAM 2023: *An unmissable event*

Following the resounding success of *Aviation Business News'* annual Predictive Aircraft Maintenance Conference last year, mark your calendars for 27-28 November, as a bigger and better event returns

In response to overwhelming demand from delegates, and to ensure an exceptional experience for all, Predictive Aircraft Maintenance (PAM) Conference 2023 has evolved into a two-day event and will take place this year at the prestigious Ham Yard Hotel in the heart of London.

With over 100 pre-registered delegates and the support of many leading aviation organisations as sponsors, PAM 2023 already promises to be an unmissable event in the diaries of aviation professionals.

Bringing together senior level executives from airlines, OEMs MRO specialists and big data experts, PAM 2023 – organised by *MRO Management's* parent brand *Aviation Business News* – gives you the perfect platform to learn about the latest developments and upcoming practices in the field of predictive aircraft maintenance.

The exciting agenda will include insightful case studies and interactive panel discussions. Industry experts will explore a variety of topics, including:

- The benefits of predictive solutions
- The importance of industry standards and collaboration between stakeholders
- Best practices in collecting, interpreting and analysing data
- Predictive maintenance from an academic perspective
- The latest legal and regulatory issues
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Delegate fees include an invitation to a welcome drinks reception on 26 November, as well as access to an engaging networking event at the Ham Yard, featuring activities including ten-pin bowling and karaoke.

Craig Waters, *MRO Management* editor, said: "We were overwhelmed by the positive feedback from last year's attendees, so it made sense to expand PAM to be bigger and better in 2023.

"The agenda has been carefully crafted to shine a spotlight on the most pressing issues, emerging trends, and cutting-edge solutions for this sector.

"We want to make sure that delegates get the most out of attending – from learning about the latest projects, exchanging information and best practices, and the great networking opportunities – PAM 2023 is an absolute must for the industry."

VISIT

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for the full agenda



2022 key takeaways:

120+

Delegate attendees onsite at the event

40+

Airline attendees representing airlines from five continents

97%

of attendees rated the conference very good or better

100%

of attendees plan to attend PAM 2023. More than half rated the networking as excellent

“We were pleased to sponsor the inaugural Predictive Aircraft Maintenance Conference in 2022. This proved to be an extremely worthwhile event for EirTrade with networking opportunities generating worthwhile discussions and fostering new relationships. The structure of the day created a professional environment for discussion and the conference delivered powerful insights with expert speakers and knowledgeable industry participation.

EirTrade is pleased to work closely with the organisers on an enhanced event for 2023 which will integrate the exploration of new topics covering recycling, teardown and sustainable practices. We are excited to be part of the team to bring this industry-leading forum to reality and proud to be Platinum Sponsor. We look forward to welcoming everyone to participate in a fantastic agenda and a great event.”

Ken Fitzgibbon, chief executive, EirTrade Aviation

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Testimonials:

“Predictive Aircraft Maintenance 2022 was an excellent conference; very well managed with thought-provoking sessions including industry leaders and expert speakers on this subject. The mixture of networking opportunities and conference topics encouraged interaction between all participants, which was vindicated by the quality of questions that came from the floor, and which were expertly answered.”

Jim Berryman, aerospace and defence director, Bolloré Logistics

“It was great to represent easyJet at the Predictive Aircraft Maintenance Conference 2022. Events like this are invaluable to connect like-minded visionaries to share experiences and ideas. Each member of the organisation team was incredibly efficient, professional and enthusiastic.”

Craig Lynch, head of predictive maintenance, easyJet

Clockwise from top left: OEMs MRO specialists will attend PAM; case study sessions will be part of the agenda; collaboration between stakeholders will be a key topic; the prestigious Ham Yard Hotel in London will be the venue this year

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Facilitating growth in the Canadian aerospace industry through remote authorised persons

MARPA's Jason Dickstein and Stephanie Kokeas explore the implications and benefits in the development of remote authorised persons in the industry, with a focus on the changes as they affect Canadian businesses and their partners

Whether you are running, partnering with, or are a customer of a Canadian repair station, it is important to understand how they obtain approved data.

A new change in Canadian policy allows the selection of remote authorised persons, or APs. APs are persons who hold delegated authority to make findings of compliance outside of Canada. Such findings include those necessary to support repair design approvals (for

example). The 'remote' feature means that Canada now supports designation of persons outside of Canada to make findings of compliance.

The Canadian aerospace industry has experienced remarkable growth over this past year, prompting the need for changes in procedures to accommodate this expansion. In 2021 alone, the Canadian aviation sector created 212,000 jobs, an increase of 14,400 from the previous year, representing a quick recovery from Covid-19-related job losses. These jobs are largely based in Canada but many new jobs are virtual, or potentially even located abroad.

As companies grow in size, they also grow in area, creating a geographically diverse web of offices and sites. To address the changing landscape, Transport Canada Civil Aviation (TCCA) has issued guidelines allowing approved individuals to act as 'remote' authorised persons (APs), enabling them to issue Findings of Compliance outside of Canada.

What is the role of an AP?

APs typically exist within Authorised Engineering Organisations (AEOs) and Design Approval Organisations (DAOs) and will have the same sort of capabilities as those organisations.

APs review data and make findings that the data complies with the regulations. They typically do this on behalf of the Minister, as stipulated in

◀ The belly of an Air Canada Boeing 787-8 Dreamliner. Credit: Air Canada



the Aeronautics Act. This includes the power to certify an aircraft typically on behalf of the Minister. These are considered to be delegated privileges, and the AP exercises them on behalf of the Minister. Such delegations help ensure efficient certification processes.

An AP is authorised to make a finding of compliance. This is an engineering analysis comparing data to the requirements of the regulations. It can be in the context of a serialised STC or in the context of a Repair Design Approval (RDA). APs may have the authority to make a finding of compliance related to an aircraft flight manual, as well as other categories found in AC 505-005(3.9), but there are limits on these powers as well.

Some topic areas are off-limits: APs are not authorised to issue a finding of compliance related to equivalent safety, special conditions for airworthiness, issuance of a type certificate, or part design approvals. While the AP cannot issue a type certificate, or a part design

approval, the AP is allowed to make findings that TCCA may reply upon in support of the ultimate issue of a type certificate, or a part design approval. Having an AP within the business can be necessary when it comes to data approval. The findings of an AP can do plenty to speed up the operations of a business and, when efficiency and safety are prioritised, having a qualified and authorised AP on site can give an organisation the extra bit of support that it needs.

A challenge presents itself when recruiting APs, as there are specific educational and technical backgrounds required and it may be challenging for a company to find or retain qualified APs.

“The Canadian aerospace industry has experienced remarkable growth over this past year, prompting the need for changes in procedures to accommodate this expansion”

With the expansion of the aeronautical industry, companies operating in Canada face the challenge of maintaining these specialised experts on-site or finding available professionals. Even when a company does have a core of APs within its numbers, there are strict rules governing the workload given to an AP, with the TCCA taking preventative measures to alleviate the burden these ‘in-demand-employees’ may face.

In order to address international support of APs, the TCCA Standards Branch issued an Advisory Circular which became effective on April 3, 2023: AC 505-006, Aircraft Certification Authorized Persons Located Outside Canada. This Advisory Circular allows

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“Having an AP within the business can be necessary when it comes to data approval”

Canadian DAOs and AEOs to apply for approval of remote delegations – specifically, for people functioning as an AP located outside of Canada. The Advisory Circular enables companies to maintain a core of specialised resources while giving them more opportunities to find qualified APs outside of their local base of operations, and to send APs to locations in which they are needed. Unlike the requirements for Design Approval Representatives (DARs), APs within AEOs or DAOs do not have to meet residency or citizenship criteria.

However, the AEOs and DAOs must have an ordinary place of business in Canada, maintaining a connection to the country. Remote APs have the same power as those located within Canada, giving companies the power to select APs with an appropriate background from their global base of operations rather than being pigeonholed into making selections from what very well may be a smaller applicant pool. For example, if the perfect data approval candidate is living in Japan, then an organisation may select that individual as an AP within the organisation, using the recently issued

guidance. This rule also allows a company to move an AP from Canada to a remote location based upon demand at the remote location. In each case, of course, the remote person must be selected as an AP and managed by the DAO or AEO.

To maintain control and ensure operational effectiveness, the TCCA provides guidance on the approval and management of remote APs. First, a direct corporate relationship between the company and the AP is required, with most APs employed by the company expected to remain based in Canada. While specific guidelines regarding the number of remote APs are yet to be established, larger companies can anticipate approval for more remote delegates as long as the ratio of remote to Canada-based APs remains within the TCCA's acceptable (and as-yet to-be-determined) limits.

The TCCA also emphasises the need for companies to maintain a manageable business model rather than embracing a scattered or overly remote approach. The DAO/AEO in question cannot entirely decentralise, practices and procedures are to be monitored by the TCCA, and

companies will have to retain their primary identity as a Canadian business.

The Advisory Circular will impact businesses differently depending on scale and present reliance on APs. Larger companies with a global base of operations will need to find a balance between the appointment of APs in the traditional sense and embracing the new procedures outlined in the Advisory Circular. The TCCA retains the right to reject the authorisation of an AP if the DAO/AEO has authorised too many remote APs or the ratio of those in Canada to those out of the country is too high. Companies who have thus far embraced the authorisation of APs and have built up a centralised base in Canada will be able to continue to expand in ways that otherwise would not have been possible.

The Advisory Circular provides added convenience for larger companies operating in multiple locations and allows APs to participate in the certification process while abstaining from forcing undue hardship onto those qualified for AP positions. By enabling remote involvement, the Advisory Circular facilitates collaboration among dispersed teams, benefiting both the companies and the certification process by promoting efficiency while maintaining safety standards.

The ability to issue a finding of compliance remotely allows for more efficient operations and a broader scope of expertise to be considered by the DAOs and AEOs. By striking a balance between global operations and maintaining a core presence in Canada, the industry can harness the benefits of remote APs while adhering to established regulations, ensuring safety and integrity. Larger companies, likely those with an already established global reach, will be able to use the guidance of this Advisory Circular to streamline their certification process.

TCCA is more likely to grant a remote AP application when the expert applying to be a designee has some specialised knowledge, or when it is inconvenient for authorisation to be granted to someone located in Canada. M

▲ An Air Canada Boeing 787-9 Dreamliner. Credit: Air Canada

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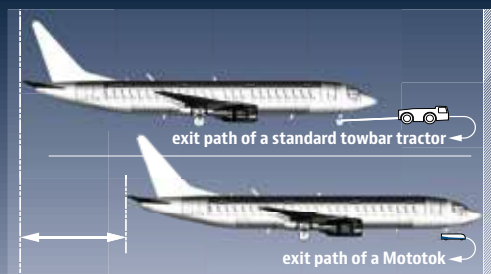
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1

2024: A MILESTONE YEAR FOR EMBRAER'S OGMA PLANT

Embraer's service and support business is being strengthened via a Pratt & Whitney project at its OGMA site where turnover is projected to more than double in just a few years.

Kevin Rozario reports from Lisbon

1. OGMA handles engineering support and MRO, CAMO, modifications and retrofit for the Embraer E-2 family
2. Francisco Gomes Neto, Embraer's chief executive officer

OGMA, a 100-year-old aeronautical facility near Lisbon, Portugal is critical to the MRO operations of Brazilian aircraft manufacturer Embraer. Once fully owned by the

Portuguese state, Embraer has held a 65 per cent stake since 2005 via the entity Airholding SGPS (100 per cent Embraer) and the rest by idD Portugal Defesa (100 per cent Portuguese state).

Embraer has invested heavily to make the plant a global focus for its growing services and support a business whose revenue is now ahead of pre-pandemic figures. But a true game-changer will come in 2024 when OGMA completes its biggest expansion and development programme, costing €74 million, to serve as a Pratt & Whitney (PW) authorised maintenance centre (AMC) supporting a wider range of GTF and other engines.

Paulo Sérgio Monginho was appointed OGMA's new chief executive officer in November 2022. At Embraer's annual media day in June, where *MRO Management* was present, he explained more about the project and its impact.

For perspective, services and support, as a division, delivered \$1.27 billion in revenue for Embraer in 2022, growing 12 per cent on the year before, and approximately 28 per cent of Embraer's total revenue. In pre-pandemic 2019, that share was only 19 per cent, showing how important the business has become. In the first quarter of 2023, the growth rate in services and support accelerated to 20 per cent reaching \$326 million.

With the backlog growth increasing last year, MRO is looking healthy. Embraer also added E2 services agreements for TUI and Air Peace, renewed and expanded services with LOT Polish Airlines, and agreed deals with Avantto's Executive Jet and Sky High.



2

\$1.27
BILLION



Services and support, as a division, delivered \$1.27 billion in revenue for Embraer in 2022, growing 12 per cent on the year before, and approximately 28 per cent of Embraer's total revenue

\$2 billion target

At the recent media day, Embraer's chief executive officer Francisco Gomes Neto said: "Services and support has seen consistent growth in both revenue and profitability. We see the unit achieving more than \$2 billion (annually) over the coming years, especially with the Pratt & Whitney GTF contract."

Monginho added: "Services and support is a very healthy business with a strong backlog, mainly made up of aircraft modifications, maintenance, digital services, material programmes and training."

In addition, the Beacon project – developed to "connect and synchronise industry resources, the after-market supply chain and aviation services professionals" within a responsive platform – has also seen more contracts come its way in the past year. New clients include Binter, Vortex, Pulse, Aero-Masters, JetBlue, Aeroméxico and Jetflight Service. Beacon has also expanded into the helicopter segment.



1

“OGMA is becoming a bigger cog in Embraer’s wheel as a high percentage of revenue is derived from MRO”

Embraer is consolidating its MRO activities. For example, the company shut down its MRO facility in Connecticut, US, moving everything to Melbourne, Australia “to maximise the use of assets in our organisation,” said Neto.

In this respect, OGMA is becoming a bigger cog in Embraer’s wheel as a high percentage of revenue is derived from MRO and the site now serves more than 60 customers from at least 30 markets.

Since 2020, OGMA has been accredited as an AMC for PW for the maintenance of the PW1100G-JM engine and that was when the industrialisation process was started. In 2021, capability was

extended to the PW1900G engine and OGMA is also adding complex repairs to the portfolio. The PW GTF 1500G series (Airbus A220) and TP400 (A400M) will also be added when a new test bench opens.

Milestone year

From April 2024, OGMA will induct the first engines, starting with PW1100s and then PW1900s in 2025, according to Monginho. While other PW and Rolls-Royce engines fit the existing and new test benches, several are mature models and/or serving declining markets, with high investment requirements.



2

€600

MILLION



The PW project injects a new lease of life into the business. It will create around 300 jobs over the next four years and will allow OGMA’s turnover to reach almost €600 million annually

The PW project injects a new lease of life into the business. It will create around 300 jobs over the next four years and will allow OGMA’s turnover to reach almost €600 million annually, up from around €250 million today. Commercial timelines are more aggressive compared to military – weeks rather than months – so getting the industrialisation right is paramount.

Embraer’s worldwide MRO network is very large with five airframe MROs, nine authorised MROs and three owned component MROs. Customer care is centralised with a 24/7 team in Brazil, with 70 staff taking roughly 35,000 calls per year from 1,100 clients.

OGMA itself already offers MRO programmes for a wide range of aircraft as well as engines and components, as well as aerostructures manufacturing. It is one of the most comprehensive service centres in the world for commercial and executive aviation, along with military aircraft.

The facility, which has a runway that is almost as long as the one at nearby

1. OGMA’s engine business is being ramped up

2. Paulo Sérgio Monginho, OGMA’s chief executive officer

3. OGMA is a core location for MRO



3

“April 2024 is when OGMA will have to be ready for the arrival of the first engines from PW”

Lisbon Airport, has a good geographic position. It is an Embraer MRO service centre, handling MRO for the entire portfolio from the ERJ to the new E2 families and the site is the service centre for Europe, Middle East, India and Africa (EMEIA).

Meanwhile, the ASM side for PW (as mentioned), and Rolls-Royce engines, both turbofan and turboprop, should be the growth areas of the future. OGMA delivered the 100th Rolls-Royce AE 1107C engine this year, having started with them in 2018.

Covering an area of 440,000 square metres, 160,000 square metres consist of covered hangars: 11 of them for maintenance across several platforms including some that are defence-related, “which is in our DNA” said Monginho. Embraer’s KC390 is the flagship within the defence portfolio although the site also handles Airbus C295s and Lockheed Martin F16s.

Among the philosophies applied at OGMA – and Embraer more widely – is the Japanese Kaizen technique of continuous improvement that is claimed to optimise human resources and make processes more efficient. It is a method that all Embraer senior executives, from the CEO down, often refer to.

A one-stop-shop

Even prior to the PW project, engines was the largest business area representing more than 50 per cent of OGMA’s total turnover. Aerostructures accounts for another 25 per cent (roughly €50 million) and its team – containing around 500 mechanics, a quarter of the workforce – also develops parts than can help the MRO business.

Components are not important from a volume perspective but crucial in presenting OGMA as a full-service facility for the customer, and part of a strategy to keep bigger customers fully in-house. It is also an enabler for the MRO side, and a step up to bigger components such as propellers is being considered.

Monginho commented: “OGMA is basically a MRO but we are a production facility as well. We manufacture parts for many customers including key OEMs, either at Tier 1 or Tier 2. We are a one-stop-shop and there aren’t that many in the world.”

One particular strength of OGMA is its staffing. Many employees have been with the company for 30-40 years; in the post-Covid ramp-up, sourcing skilled maintenance personnel and mechanics is said to have been less of a problem here than at some other locations.

That is important because April 2024 is when OGMA will have to be ready for the arrival of the first engines from PW – a step, including complex repairs, that will transform the business. “We are effectively developing a new company,” said Monginho.

The first objective is the 1100s, and then the 1900s whose date has been brought forwards – substantially – to 2025. For that, Embraer has put in place a dedicated team that is also cross-functional. OGMA’s preparations since 2020 have been a priority to ensure capability for these engines and the business is already preparing to induct more of them.

Furthermore, an Aeronautical Academy at the site will open this summer, initially to fulfil OGMA’s own needs and create additional slots that can ultimately grow revenue. In its first year, training will focus on Part 147 EASA Process Certification and Technical Basic Training (B1 E B2). Thereafter (from 2024) the plan is to create a global marketplace for the academy’s services. A total of 76 TMAs are expected to be trained between 2023 and 2026.

OGMA seems to have set a framework for a well-defined course that will ensure its future growth, backed by almost a century of experience. 



UNRAVELLING SUPPLY CHAIN COMPLEXITIES

Mario Pierobon speaks with *Saravanan Rajarajan*, director of aviation solution consulting at Ramco Systems, to assess the complexities of aviation MRO and the role of tech, the key touchpoints for supply chain management systems, and what the software of the future will look like

Aircraft maintenance, repair, and overhaul (MRO) sourcing grapples with a multitude of complexities while locating the parts. At the same time, software can enable efficient management and coordination of complex supply chain activities involved in aircraft MRO.

Multiple factors

Aviation MRO complexities are due to multiple factors surrounding the aviation parts and parties, namely the suppliers, MRO organisations and shippers involved in the supply chain, explains Rajarajan.

“These factors are usage, failure rates, maintenance policies, parent equipment, operating conditions, multi-nodal inventory, trade restrictions, regulatory controls, limited sourcing options and lead times, alternates, modification statuses, configuration effectivity, interdependencies and deviations,” he says.

“In the future, SCM software will have a larger ecosystem to process data from the supply chain”

“Aviation software enables the critical visibility of parts and stocks in the supply chain. Organisational visibility must be expanded outside the warehouses, which includes items in transit, under receiving, under quarantine, due from the supplier or due for repair. Ramco has the global visibility of items separated between serviceable and unserviceable, considering the alternates for the part in demand.”

By enabling collaboration and data sharing in the ecosystems, the visibility of stocks is extended outside the organisations, says Rajarajan.

He explains: “Our Supply Chain module has SPEC 2000 adapters for procurement and repairs with the

availability of the parts from registered suppliers. Data links can be extended to other partners such as airlines, original equipment manufacturers (OEM) and marketplace to receive stock availability, turnaround time (TAT), and item certifications on demand or at a scheduled frequency. All data are processed and displayed for the user in a screen showing external part availability to support decision-making.”

Software key touchpoints

The digitisation of the supply chain enables aviation MROs to be more agile, accurate, granular and efficient, according to Rajarajan.

“For increased agility, supply chain management (SCM) software must be capable of ad hoc and real time planning for changing supply and demand situations. Planning cycles are minimised and become a continuous process to reach dynamically varying demands and constraints,” he says.



2

“For instance, our Float computation and optimisation module leverages data and machine learning algorithms to forecast the float requirements and the best possible option for managing the service level agreement. Data on the supply chain, part engineering and reliability are processed together to arrive at solutions ranging from driving reliability, TAT, replenishment or purchases.”

Next-generation analytics provides increased accuracy and granularity, thanks to real-time, end-to-end transparency throughout the supply chain, enabled by robust data interfaces with tracking systems and electronic data interchange (EDI) interfaces, adds Rajarajan.

“High-value parts moving in the shops are tracked through radio frequency identification (RFID) and processed through SCM software to determine



1



3

“The digitisation of the supply chain enables aviation MROs to be more agile, accurate, granular and efficient”

wait time and optimise the routes. In our software, third-party adapters enable locating the parts’ physical location. This information is processed and rendered graphically in the Route Anywhere mobile application,” he says.

The automation of physical and software tasks also boosts efficiency in supply chain management, adds Rajarajan.

“For example, the parts removed from aircraft are tracked through RFID until they reach the unserviceable unit processing location where automatic storage and retrieval systems for physical storage handle them. The software does the screening and takes over the disposition of the unit automatically,” he says.

“Based on the availability of reliability and overall float requirements, the decision is taken to either repair the unit, thus replenishing the number of serviceable units, or keep the unit on parking to conserve costs. Once deemed for repair, based on the automation rules and supplier contract, the entire repair order process is automated in the software.”

Future supply chain software

In the future, SCM software will have a larger ecosystem to process data from the supply chain, starting from suppliers, customers, warehousing systems, logistics carriers, customs agencies and regulatory agencies, says Rajarajan.

“Software will gain the intelligence needed to assist decisions or even automate transactions based on frequency and criticality. We are embedding more use cases through co-creation with our customers to bring decision-assist capabilities by leveraging data and machine learning (ML) platforms. We are working with a consortium led by SITA on the blockchain to be part of the network. Currently, we are carrying out the focused proof of concept on the advanced part exchange between the network participants,” he adds. 

1. Float analysis and review
2. Inquire material count and location information
3. Next-generation analytics provides increased accuracy and granularity

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AVIATION WEEK
NETWORK



1

Scaling the repairs process

Industrialising repairs has been a big focus in recent times. *Kevin Rozario* reports



2



3

In 1941, the US government asked General Electric (GE) to develop the first American jet engine at a time when allied defence, industrial collaboration and technological advancement were all concentrating minds.

GE delivered the very next year and more than 80 years later, GE Aerospace and its joint ventures have an installed base of more than 40,000 commercial and 26,000 military aircraft engines.

As with all engine makers, whose revenue relies heavily on flying hours and service contracts, coming out of the pandemic has been a relief – as well as a curse. Income streams on the MRO side are returning, but because maintenance operations were minimal during Covid times, many staff were let go by MROs and, to a degree, by OEMs.

Now that flights are filling up again, airlines are putting their services back, but carefully so that they can increase passenger load factors, thereby scraping back margins and profits, which IATA says will be back this year, industrywide. Airlines are swapping out smaller aircraft – used during the pandemic when there was anaemic demand – for larger ones on former higher capacity routes, especially in the US.

“GE Aerospace has a big MRO network and it has just made it even bigger by opening a services technology acceleration centre (STAC), located close to the company’s headquarters in Cincinnati, US”

The sudden demand, and behind-the-scenes preparation that is required ‘in the shop’, has led to supply chain shortages in manufacturing, as well as parts shortages in MRO. To be profitable, airlines keep engines on the wing for as long as possible. However, it is inevitable that, with a base of 40,000 GE commercial jet engines – some relatively old – shop visits and full overhauls are increasing again.

Facility expansion by GE

GE Aerospace has a big MRO network and it has just made it even bigger by opening a services technology acceleration centre (STAC), located close to the company’s headquarters in Cincinnati, US. The facility boosts GE’s ability to industrialise and scale the repair process, which also helps the supply chain.

Over the past four years ‘industrialising’ repairs – in other words adjusting and improving the lifecycle of parts – has

been a major aim of Nicole Tibbetts, GE Aerospace’s chief manufacturing engineer for MRO. She says: “We’ve grown more than 30 per cent year-on-year in terms of the number of repairs we’ve industrialised.” From 400 such repairs in 2018, that shot up to more than 2,000 last year.

MRO shops are the pivot point for speeding up the whole process. “They actually see the hardware as it comes out of the engine, and they understand how it’s impacted and how it should be serviced,” says Tibbetts. “So, the shops tell the services engineering team what’s happening to their hardware, and that kicks off the repair development cycle.”

1. The Foam Wash 360 engine-cleaning solution from the MRO team at GE Aerospace
2. BA CityFlyer E190
3. An operator uses GE’s Deep Spool inspection system, a technology developed by the MRO team



▲ General Electric CF6-80E1 turbofan engine from an Airbus A330-200

“With a base of 40,000 GE commercial jet engines - some relatively old - shop visits and full overhauls are increasing again”

That is important in reducing the cost of ownership for airline customers. MRO is being scrutinised much more post-pandemic. “Repair is the biggest lever we have to drive improvement in dollars per shop visit,” says Tibbetts. “We’re trying to put as much repaired material back into the engine as possible.” That not only helps to cut costs, but also helps to side-step delays in obtaining parts.

During the pandemic, GE and other OEMs were faced with three big challenges: the volume of parts needed for repairs, which has contributed to slowdowns in the supply chain; the ability to roll out updated repair regimes across the whole MRO network, rather than have certain services available only at certain sites; and preparing for shop visits of the newest generation of engines, including the CFM LEAP and the GEnx, which will soon be coming in for their second shop visits. CFM is a 50/50 partnership between GE and Safran Aircraft Engines.

20

YEARS



This year, MTU Maintenance Berlin-Brandenburg and GE marked 20 years since the first CF34 engine was redelivered after a shop visit at the Ludwigsfelde location in 2003

Major industry challenges

On top of that, GE says that with the tight constraints caused by the Covid-19 pandemic “the MRO shops are facing one of the biggest challenges in the industry’s history”.

“Cost of ownership has increased with shop visits up by around 7-10 per cent across the industry,” Jamie Davey, manager – commercial engines at intelligence and advisory company IBA Group, points out. “About 50 per cent of GE’s CFM fleet still have to go through their first shop visits.”

He tells *MRO Management* that changing post-Covid economics are playing a bigger role in defining the MRO business. For example, CF34 engines are used in several of Embraer’s E-jets used on regional routes. However, when competitors like the A320 can carry more passengers, but have roughly the same engine MRO costs, this may play out very differently for these two narrowbodies as traffic returns.

On the other hand, some market changes may favour the MRO business for GE engines. “Delays in deliveries of new aircraft has put pressure on existing jets,” says Davey, meaning that the MRO business will be in more demand. Fortunately, GE appears to have generally been “doing OK” when it comes to supplying parts, according to IBA.

Meanwhile, the engine maker’s Green Team initiative – essentially designed to allow employees to learn, connect and advocate on environmental issues – is also having some positive effects in terms of training and retaining staff.

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12%



In 2022, MTU performed 12 per cent of all shop visits for the CF34-8 and -10E engines industry-wide, and over a quarter for the CF34-10E alone

However, it is still the case that more demand is being handled by smaller MRO teams, partly a reflection of the huge rise in e-commerce that drove the cargo business over the past few years.

MTU has been a risk-and-revenue sharing partner in GE Aerospace's engine programme since 1971, when the company produced the first parts for the CF6-50. This year, MTU Maintenance Berlin-Brandenburg and GE marked 20 years since the first CF34 engine was redelivered after a shop visit at the Ludwigsfelde location in 2003. Since then, MTU has manufactured parts for the entire CF6 family (CF6-6, CF6-80A, -80C2, -80E) whose two-shaft turbofan powers medium- to long-haul Airbus and Boeing widebodies.

Spreading the load

Considering that this engine family has been manufactured for over 40 years, MTU's repair and spare parts business has become increasingly important over time and, in both Hannover and Vancouver, some CF6 models are maintained by MTU Maintenance. The company has special authorisation to perform MRO work on CF34 engines as an independent provider. In 2022, MTU performed 12 per cent of all shop visits for the CF34-8 and -10E engines industry-wide, and over a quarter for the CF34-10E alone.

BA CityFlyer, a British Airways subsidiary with a fleet of 20 Embraer E190 jets, and an exclusive MTU customer since 2010, recently received one of their CF34-10E engines from MTU – the 1,500th CF34 shop visit performed at Ludwigsfelde.



“The STAC facility boosts GE’s ability to industrialise and scale the repair process, which also helps the supply chain”

“We appreciate MTU's cost-effective and customised services,” says Mark Leather, head of engineering at BA CityFlyer. “Whether it is a full shop visit for an overhaul or sudden on-site events, we know that MTU's people have the expertise.”

At the Paris Air Show in June, Garuda Indonesia announced a strategic cooperation with GE Aerospace to restore and overhaul its fleet of GE engines and those from CFM. While this is only a Memorandum of Understanding (MoU) between Garuda Group (and subsidiaries GMF AeroAsia and Citilink) and GE, it will, if contractually put in play, enable Indonesia's national airline to establish training and skills development, lease engine support, and overhaul services for its fleet of CFM56-7B and GE90-115B engines.

Kathy MacKenzie, vice president of GE Commercial Programmes, says: “Indonesia is important to us, and our support for Garuda Indonesia is a contribution to advancing this country. This step strengthens their fleet of GE and CFM engines and develops further skills for overhaul services with our support.”

▲ Garuda Indonesia announced a strategic cooperation with GE Aerospace to restore and overhaul its fleet of GE engines

On the Garuda side, the deal should help to “accelerate our business recovery” according to the airline's president and chief executive officer, Irfan Setiাপutra. He adds: “Garuda Indonesia is mainly focused on optimising production capacity through enhanced operations. One way is to increase the total of serviceable aircraft to grab wider opportunities in domestic and international networks. Having continuous support from GE to ensure aircraft readiness to be airworthy is one of the primary fundamentals for us.”

Setiাপutra's comments further underline just how critical it has become to keep jets in the sky. And while service contracts with GE for in-house work are the most lucrative way for GE to drive revenues, the partnership with MTU shows that flexibility is also important, and that building regional MRO services with independents may also be beneficial to airline customers in the current environment. ■



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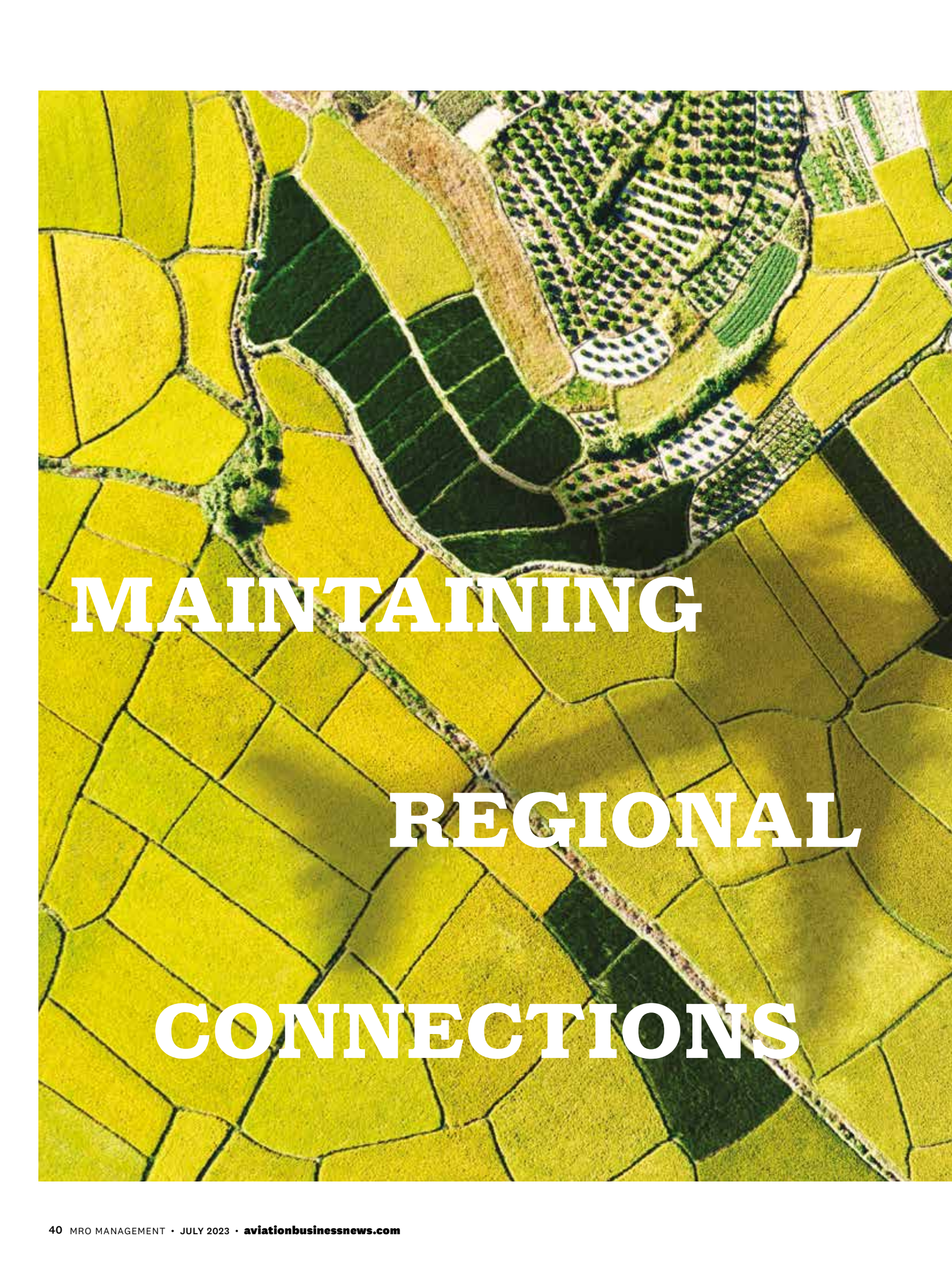
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MAINTAINING REGIONAL CONNECTIONS



Regional aircraft maintenance is becoming more sophisticated, but there are still some older types requiring strong support, as *Bernie Baldwin* reports

Successful aircraft operations depend greatly on utilisation, having the aircraft in the air for as many hours a day as possible. Only then can it be earning the revenue its operator wants to accrue.

For regional aircraft which generally operate short sectors, high utilisation means multiple flights per day. That means many more takeoffs and more landings than medium- and long-haul operations demand, all of which puts greater stress on the airframe. Consequently, there is a greater need to monitor the aircraft closely in order to maintain airworthiness.

While many regional airlines carry out their own maintenance, others don't have fleets large enough for in-house MRO to have economies of scale, so a significant number outsource the task to specialist suppliers. Third-party suppliers with a range of customers are often in a better position to invest in the technologies required to increase their capabilities.

Angus von Schoenberg and Chris Holliday at aviation consultancy ALTEA have been observing trends among providers of MRO to regional airlines. The pair have considerable experience in regional aviation – von Schoenberg at regional aircraft lessors Airstream and TrueNoord and Holliday being a former chief operating officer at Eastern Airways. And both have served as advisors to the European Regions Airline Association (ERA).



1

As for what they have seen in regional aircraft MRO, the pair comment: “As with MROs on all aircraft types, the same issues have arisen. These include a lack of manpower at MROs themselves and supply chain issues with spare parts and materials. The lack of spares is also causing MRO facilities to become congested and turnaround times (TATs) to increase substantially, meaning that MROs are more restricted in their ability to induct aircraft.

“[Aircraft] OEMs with current products continue to work to expand their own component support and hourly rate programmes with a focus on retaining existing customers, whilst also capturing as large a share as possible of new operators. Examples of these programmes include ATR’s Global Maintenance Agreement (GMA), de Havilland Canada’s Component Solutions Programme and Embraer’s Pool Programme.” In relation to the De Havilland Canada programme, the ALTEA team note that Norwegian regional carrier Widerøe recently

20%

The latest version of the PW127 – designed to reduce fuel burn and engine maintenance costs by 3 per cent and 20 per cent respectively – was put into service last year

extended its commitment to this to support its Dash 8-400 fleet for a further two years.

On the engine side, von Schoenberg and Holliday point towards the work Pratt & Whitney Canada is doing to drive operators of its new PW127XT engine into the company’s own fleet management programme. This latest version of the PW127 – designed to reduce fuel burn and engine maintenance costs by 3 per cent and 20 per cent respectively – was put into service last year.

Working to counter the manpower/supply chain/spares issues, noted by

ALTEA, is the Magnetic Group. Inga Douglas, the company’s chief commercial officer says that while Magnetic holds approvals for narrowbody aircraft, its growth plans have included assessing the market for the additional capabilities and regional aircraft consideration has been on the list. But she admits that such growth won’t come easily.

“Although we see clear signals of the need from customers, the market around us and the financial outcome doesn’t look positive for regional aircraft MRO growth,” Douglas said. “Yet again, that’s purely our opinion looking from a current market perspective; other MROs, especially those that have regional aircraft base maintenance capability already, could have a different opinion.”

On the other hand, Douglas is quick to emphasise, Magnetic Group constantly supports the regional aircraft fleet with other services. “We have been very active providing parking and storage maintenance covered by our Magnetic Line (line maintenance approval) during these past years,” she explains. “Also,

we have an extensive capability and track record when it comes to interior upgrades and modification projects. We do ATR fleet refurbishment covering the full aircraft interior and aircraft painting in our facilities. Meanwhile, we have accumulated know-how supporting the Embraer E170/190 fleet with connectivity projects, crew rest zone installations and lavatory upgrades.”

Leon Kouters, vice president, sales and marketing at Fokker Services Group, also views the market as being tough. “In general, there is a shortage of capacity in the overall market, and this is the same in the regional market. This, combined with shortage in supplies, creates lots of challenges in the current market,” he says, but has a positive note to add. “Our Fokker Services Group facility in Asia, however, is expanding its capability this year with the Embraer platform.”

SAMCO Aircraft Maintenance is an Authorized Service Facility for both the De Havilland Q Series and the Airbus A220 family, as well as having certificates to work on several other types. While acknowledging a tough market, the company’s chief executive, Constant van Schaik, agrees with the trend towards increased capabilities. “As regional aircraft are adopting newer technologies,

such as carbon fibre reinforced plastics, most MROs are increasing their non-destructive testing (NDT) and composite repair capabilities,” he states.

Among the regional aircraft fleet across the world, there are a number of out-of-production types still flying commercially – and often making good money for their operators. The likes of the now-Mitsubishi CRJs, Embraer ERJs, Dash 8 turboprop family, Fokker 50/70/100, Saab 340 and 2000 and Dornier 328s are all ploughing their furrows. However, they generally need more support than the in-production types – something SAMCO is able to offer.

“We continue to service the CRJ aircraft, Embraer ERJ and Dash 8 family as our clients continue to operate profitable routes with these aircraft,” van Schaik said. “We provide support on these types anywhere between daily and line checks and D-check type heavy maintenance, although the OEMs are struggling with supplying proprietary

“While many regional airlines carry out their own maintenance, others don’t have fleets large enough for in-house MRO to have economies of scale”



3

parts such as frames, flight controls and other components.”

Some out-of-production types have never had a natural replacement, so life extension programmes (LEPs) have been introduced by their OEMs to enable longer revenue service. “The Dash 8 100-200 series LEP is currently aiming to increase the airframe’s life to 160,000 cycles!” van Schaik says. “These aircraft serve a specific function due to their short runway capabilities. Furthermore, there are cockpit upgrade programmes under development for the Dash 8 to replace the aging CRT displays which, by the way, is not part of the LEP.”

The Dash 8 LEP mentioned by van Schaik is also highlighted by ALTEA’s von Schoenberg and Holliday, who note that the aircraft’s life limit was originally 80,000 flight cycles. “This was first extended to 120,000 FCs and is now at 160,000 FCs,” they confirm. “Widerøe is the lead customer for this scheme, known as the Extended Service Programme PLUS.” The Norwegian carrier still uses



2

1. De Havilland Dash 8-400

2. Magnetic Group completes an ATR fleet refurbishment programme for Finnair

3. Inga Douglas, chief commercial officer, Magnetic Group

200



With its last aircraft produced in 1997, Fokker currently still supports a fleet of about 200 aircraft in total worldwide

the aircraft on its network, particularly because of its short takeoff and landing capabilities.

Regarding the other aircraft no longer in production, the ALTEA pair see support for them becoming a niche task. “As out-of-production regional aircraft types age, there is a natural contraction in the numbers of MROs supporting each type,” they explain. “Regionally, specialist providers for certain types have emerged such as TAM in Europe who focus on the Saab 340/2000 and C&L in the USA who are extremely active on the Embraer ERJs, including their increasingly popular cabin reconfiguration offerings to reposition the ERJ into corporate shuttles or specialist airline use such as at JSX.”

Unsurprisingly, Fokker Services Group’s Kouters says the company is strong in this area of regional aircraft MRO. “Besides the support of OEMs on these types of aircraft, we are specialised in aftermarket support for out-of-production aircraft. With the last Fokker aircraft produced in 1997, we currently still support a fleet of about 200 aircraft in total worldwide.



1



2

“As out of production regional aircraft types age, there is a natural contraction in the numbers of MROs supporting each type”

“We have had Fokker programmes in place for many years, focusing on solving any type of obsolescence in the market. We have applied this knowledge now also into other markets,” he adds.

When it comes to introducing recent technologies to help lower costs and/or reduce turnaround times (TATs), Kouters points to two quite different areas. “The first is automation in our warehousing,” he comments, “while the second is the use of new inspection technologies.”

At SAMCO, according to van Schaik, the technology initiatives emphasis is also different. “We are mainly focusing on digital MRO and big data,” he comments.

Analysing the adoption of new MRO technologies from the outside are ALTEA’s von Schoenberg and Holliday. The data-led work mentioned by van Schaik is on their radar, too.

“OEMs of more recent regional aircraft are now starting to really explore the potential inherent in the data that can be collected from the sophisticated systems found in newer types, which typically focus information into a central maintenance computer or similar unit,” the ALTEA duo remark. “Embraer has just announced the next generation

version of its AHEAD (Aircraft Health Analysis and Diagnosis) system which is a good example of the possibilities offered. Data is collected from each participating aircraft (often including information transmitted via ACARS whilst in flight) and is transmitted to Embraer, where it is used to identify and predict potential issues before they become critical.

“AHEAD integrates and analyses trends and the monitoring can detect anomalies and identify patterns that indicate potential issues and degraded performance, allowing preventative action to be taken,” von Schoenberg and Holliday add. “This information allows operators to plan in advance to avoid unnecessary disruption, or unneeded maintenance, enabling them to reduce the time an aircraft spends on the ground which also saves costs.”

It also means that regional airlines get more time gaining revenue by having their aircraft in the air – exactly what airlines want from their MRO providers. 

1. Widerøe uses out-of-production Dash 8s in some harsh conditions on its network

2. Engine maintenance at SAMCO



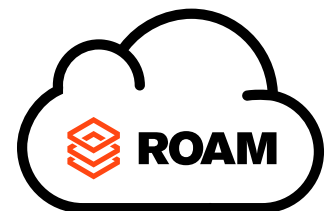
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A GREEN SPACE

Sustainability is playing a part in the design and construction of hangars. *Craig Waters* reports

◀ HAECO Xiamen says it is combining innovation, green design and advanced technology for the construction of a new aircraft maintenance facility at Xiamen Xiang'an International Airport



Maintenance hangars must provide ample and safe spaces in which skilled teams can conduct major MRO activity. These wide and open facilities are expensive investments and must be large enough to of course accommodate aircraft, but also a variety of equipment such as scaffolding, maintenance stands, tools and ground support equipment (GSE) including electrical tugs and aircraft stabiliser stands.

The design and construction of aircraft hangars have evolved over the years to meet the changing needs of the aviation industry. Looking ahead, the sector is expected to witness several trends that will further shape its landscape, including advancements in automation and technology, with robotic systems and intelligent sensors helping to streamline maintenance processes.

Furthermore, as air traffic increases and airports become congested, maximising space within facilities will become even more critical. Movable partitions, vertical stacking systems and modular designs will ensure efficient utilisation of resources, and allow hangars to accommodate a greater number of aircraft – vital for airports where there is limited space to construct new or expanded hangars.

A big trend, though, is the incorporation of sustainable and eco-friendly features. As environmental concerns continue to gain importance worldwide, the aviation sector is actively seeking ways to reduce its carbon footprint and adopt eco-friendly practices. The design of aircraft hangars will need to incorporate ways to reduce energy consumption, deploy renewable energy sources and utilise eco-friendly building materials. Solar panels, rainwater harvesting systems and energy-efficient lighting are already being integrated into hangar designs to minimise the environmental footprint.

There are several MRO hangars in operation and under construction around the world that are earning some impressive green credentials.

Since 2008, Hangar 25 at California's Bob Hope Airport has been operating as a 'green' facility. One component of the sustainability focus for Hangar 25 was the installation of 57,000 square feet of Metal Sales T2832 and TLC-1 metal wall panels on the outside facade, contributing to 35 per cent of the hangar's recycled materials. Other features of the facility include a solar-powered roofing system that runs all electric vehicles and office operations, low-water plumbing fixtures, native plant landscaping, low-maintenance diamond-polished concrete flooring and an innovative water mist fire suppression system.

In May 2023, Fokker Services Group (FSG) opened its new widebody hangar at its facility in Hoogerheide, Netherlands.

Co-developed with lightweight modular architecture specialist Gaptex, and with sustainability at the forefront of its design, the facility is 100 per cent electrically powered and has an environmentally friendly geothermal energy system. By the end of this year, a photovoltaic solar power capacity will have been installed on the rooftop of the hangar, further reducing the dependency on external energy sources. Furthermore, emissions from the construction are expected to be 75 per cent lower when compared to a conventional hangar.



◀ Ryanair has announced its hangar at Dublin Airport is set to be one of the most environmentally friendly hangars in Europe

“Solar panels, rainwater harvesting systems and energy-efficient lighting are already being integrated into hangar designs to minimise the environmental footprint”

Roland van Dijk, chief executive of FSG, said: “We’re in a relentless pursuit of global excellence with a strong focus on sustainability, of which this new hangar is a key milestone.”

In January, HAECO Xiamen launched the construction of a new aircraft maintenance facility at Xiamen Xiang’an International Airport. Once completed, it will be the largest single span aircraft maintenance hangar in the world, according to the HAECO Group member.

HAECO Xiamen said it was combining innovation, green design and advanced technology in an attempt to “achieve optimum energy utilisation and operational efficiency”. The company stated that the construction project has been designed from the outset to optimise operational efficiency and maximise space utilisation, helping to reduce aircraft maintenance turnaround times and improve punctuality to meet customers’ maintenance schedules.

The innovative ‘centre-axle’ design connects the hangars and ancillary buildings, facilitating logistics management and resource sharing. The organisation states that the new maintenance facility will also feature innovative design and state-of-the-art green measures including solar

€40

MILLION

Ryanair is investing €40 million in a 120,000 square-foot hangar at Dublin Airport that will consist of four bays

power, intelligent building management systems, intelligent lighting controls, water storage and air conditioning systems, as well as advanced wastewater and air treatment, with the goal of achieving gold certification under the LEED-NC (Leadership in Energy and Environmental Design for New Construction) rating system.

Ryanair, Ireland’s top airline, is investing €40 million in a 120,000 square-foot hangar at Dublin Airport that will consist of four bays. Construction is scheduled to commence in Q4 2023, with maintenance operations expected to begin in Q2 2025.

The airline states the facility will utilise gas absorption heat pumps to reduce carbon footprint by up to 35 per cent.

Gas absorption heat pumps utilise

a heat exchanger and refrigerant to transfer heat, serving various purposes such as water heating, enhancing indoor air quality and creating a comfortable environment in both residential and commercial spaces.

Ryanair chief executive Eddie Wilson, said: “This facility will be state-of-the-art and one of the most environmentally friendly hangars in Europe and will facilitate the maintenance of our growing fleet.”

Renowned aircraft hangar door manufacturer Jewers Doors has been involved in some impressive hangar projects worldwide, utilising advanced insulation materials and design techniques. Jewers Doors ensures that their hangar doors contribute to efficient energy management, improving overall sustainability.

Jonathan Jewers, director at Jewers Doors, commented: “Thermal insulation is becoming increasingly important, especially on large hangar doors. Hangars of this type still must comply with building regulations, and part of those regulations means that they must be well insulated.”

As a hangar door is traditionally a major element of a hangar facade, Jewers expressed their frustration that some companies are hiding behind regulations which state that a door need not perform as efficiently as the main facade.

“In the UK, a door need only meet a thermal U-value of 1.3 W/m²K, whereas the facade adjacent to the door should be as low as 0.18 W/m²K, or seven times more thermally efficient.

“This is not in the interest of being sustainable. It may be acceptable for smaller domestic personnel doors which are for instance only 1.8 metre square to have very poor thermal properties. I do not feel that is the same case when hangar doors can be 1,000 times bigger.”

Well designed maintenance hangars that place emphasis on sustainability are crucial for not only reducing the aviation industry’s environmental impact, but also in meeting the growing demand for more eco-friendly activities. 

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“Most core parts go back into the supply chain, advancing the circular economy”

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instance. That's when we partner with responsible recyclers globally. Last year, we disposed of 1,200 tonnes, but without that repurposed step-in, it could have been significantly more.

However, there is a significant gap as circularity needs to be recognised in the 2050 net-zero pledges laid down by IATA, the governing body of aerospace.

IATA is focused on the inflow of new equipment and how its operated. There has been no end-of-life conversation. We need to play a part in that dialogue. The current focus is on sustainable aviation fuel, more efficient engines, aircraft routing and carbon capture initiatives. That is admirable, but there remains a gap as we are not talking about EOL. We aim to raise the profile of EOL services' contribution to this goal by shining the spotlight on the secondary first approach to sustainability and circularity. **M**

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