

# MRO

Aerospace Magazine

## Used Serviceable Material

A challenging market



### Technical Training

New technologies drive the trends

### Line Maintenance

Avoiding mechanic idle times

### Women in MRO

Working smart is not a matter of strength

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## It is not always a matter of physical strength

In recent years, the aviation industry has witnessed a significant shift in gender dynamics within traditionally male-dominated fields like aircraft maintenance. Women are breaking barriers, challenging stereotypes in aircraft maintenance.

One noticeable trend is the growing number of women entering the aircraft maintenance profession. Women are increasingly enrolling in aviation maintenance programs, earning their certifications, and pursuing careers as aircraft mechanics and technicians.

Aviation companies and organizations are actively promoting diversity and inclusion initiatives. They recognize the value of diverse teams in fostering creativity and innovation. Advancements in aircraft technology have made maintenance tasks less physically demanding, reducing barriers for women who might have previously felt deterred by the physical aspects of the job. Modern tools and technology are leveling the playing field, allowing individuals to focus on their skills and expertise.

Enjoy reading Swaati Ketkar's article about women in aircraft maintenance featured in this month's issue of our MRO magazine.

**Peter Jorssen**  
Publisher

An increasing number of women decide to work in male domains.  
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Ascent Aviation



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## Used serviceable material – a challenging market

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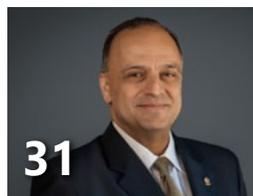
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## Emirates awards Safran multiple new contracts worth US\$1.2 billion

Emirates, the world's largest international airline, has awarded a series of contracts to Safran, worth over US\$1.2 billion combined. This includes a US\$1 billion deal for the latest generation Safran seats for Emirates' new fleet of Airbus A350, Boeing 777X-9 and existing Boeing 777-300 aircraft. The agreement includes business-, premium economy- and economy-class seats for the Emirates Airbus A350, and business-, premium economy- and economy-class seats for the Boeing 777X-9. The new seats will offer a host of enhancements that set a new standard for comfort, privacy and convenience, including generous space and a bolder roster of luxurious features, stylish interior finishes and next level-technology in every cabin class. The deal also represents a significant export order for a French company and is part of Emirates' ongoing investment into France and Europe. In addition to seats, Safran Cabin will be providing Emirates' A350 fleet with galley shipsets in line with the airline's high standards when it comes to quality and design. The galleys, both for Emirates' A350 and B777-9 fleet will be equipped with GEMini and the new high-end type NUVO-galley inserts with advanced features, efficiency and technology. Safran Landing Systems will be supplying high performance wheels and carbon brakes for the Emirates A350 fleet. These brakes offer significant weight savings and feature a unique design that provides better cooling for shorter turnaround times (TAT)



Jean-Michel Hillion, Safran Landing Systems, Victoria Foy, CEO Safran Seats, Adel Al Redha, Chief Operating Officer, Emirates, Yves Melisse, Safran Cabin, Sébastien Weber CEO Safran Aerosystems © Emirates

and increased fleet availability. Safran Passenger Innovations will be providing its RAVE AeroConnect Ka solution to Emirates, allowing connectivity across multiple providers and frequencies. This end-to-end solution will disrupt the inflight connectivity status quo by offering Emirates unrivaled flexibility in entertainment and provider choice. 50 Airbus A350s, 60 Airbus A380s and 50 Boeing 777X-9s will be equipped with Safran's agnostic satcom connectivity solution. In addition to providing equipment for Emirates' new fleet, Safran is also working closely with the airline on its current retrofit programme, which includes providing new seats for the Boeing 777 and Airbus A380 aircraft. Safran Landing

Systems will perform exclusive services to Emirates for nose landing gear overhaul for the A380 fleet. Safran Landing Systems' broad network, which includes facilities in Singapore and France, will provide Emirates with the expertise, capabilities and tailored support services covering the A380's landing systems lifecycle. Furthermore, Emirates has signed a ten-year service agreement with Safran Aerosystems covering repair and maintenance for Boeing 777 safety and cabin systems components. Safran Aerosystems' Middle East facility is located near Al-Maktoum Airport in Dubai and will deliver maintenance services that will further enhance Emirates' operational efficiency.



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## Rolls-Royce signs TotalCare agreement with Amazon Global Air



© Rolls-Royce Trent 700 engine

Rolls-Royce has signed a TotalCare service agreement with Amazon Global Air to supply maintenance services to its fleet of ten Trent 700-powered Airbus

A330-300P2F (passenger-to-freighter) aircraft, which will be operated by its carrier partner. TotalCare is designed to provide predictability and operational

certainty for customers by transferring time on wing and maintenance cost risk back to Rolls-Royce. This industry-leading premium service offering is supported by data delivered through the Rolls-Royce advanced engine health monitoring system, which helps provide customers with increased operational availability, reliability and efficiency. The popular A330 conversion programme began in 2017 and is accelerating as both capacity and suitable feedstock become available. There have been 28 A330 converted aircraft since 2017, 85% of which were Trent 700-powered aircraft. This supports a key pillar of Rolls-Royce's commercial strategy, which is to focus on keeping these reliable and proven engines in service for many years to come.

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## Sanad unveils SAMENA-region's first certified CFM LEAP engine MRO centre

Sanad, the global aerospace engineering and leasing solutions company, wholly owned by Abu Dhabi's sovereign investor Mubadala Investment Company PJSC (Mubadala), has announced the inauguration of its LEAP engine MRO centre, marking a significant milestone as the first certified engine MRO centre in the South Asian (India and Pakistan), Middle East and North Africa (SAMENA) regions. This world-class centre, spanning over 5,000 m<sup>2</sup>, will offer advanced technical capabilities within Sanad's new state-of-the-art facility in Abu Dhabi, becoming part of the global LEAP MRO network. The announcement follows a landmark 11-year shop visit off-load agreement, signed during the Paris Air Show in June 2023, in partnership with GE Aerospace and Safran Aircraft Engines, both leading providers of jet engines, components and aircraft systems. Through the agreement, Sanad significantly expanded its MRO services to include new-generation CFM International LEAP-1A and -1B engines that power Airbus A320neo and Boeing 737 MAX-family aircraft. These engines have gained global recognition for their exceptional reliability and fuel efficiency. In a special ceremony in Abu Dhabi, Sanad unveiled the centre and showcased the first LEAP engine inducted in record time and marking the



Official inauguration of Sanad's CFM LEAP engine MRO centre

© Sanad

commencement of the LEAP engine MRO programme. The MRO centre began operations within a month of signing the agreement and successfully completed the MRO process on the first LEAP engine from flydubai just four months after its signing. The centre is poised to receive over 450 LEAP engines for MRO services.



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## HAL and Safran partner for commercial engine parts manufacturing in India



Under the new MoU HAL will produce LEAP engine parts for Safran Aircraft Engines in its facilities in Bangalore  
© Adrien Daste/Safran

India's leading aviation company Hindustan Aeronautics Limited (HAL) and Safran Aircraft Engines have signed a Memorandum of Understanding (MoU) announcing their intent to develop industrial cooperation in forging parts' manufacturing for commercial engines. Under this partnership HAL will manufacture LEAP engine components at its Bangalore facilities, in line with the 'Make in India' policy of the Indian government and to support the rapid expansion of the LEAP programme. Safran

Aircraft Engines has a long-term vision of establishing a comprehensive aero engine ecosystem in India. The company currently operates three production facilities in the country, located between Hyderabad and Bangalore and plans to add a fourth site in Hyderabad dedicated to LEAP MRO activities by 2025. Additionally, a Helicopter Engine MRO (HE-MRO) facility is under development in Goa in collaboration with HAL and is expected to be operational by 2025. "Safran is a long-standing partner, especially on our helicopter programmes and also for parts production within the frame of our joint venture in Bangalore. We are very proud to take this partnership to another level and to develop our skills in key technologies like forging manufacturing", said Shri C.B. Ananthakrishnan, Chairman and Managing Director, HAL. Strengthening our contribution to the production ramp-up of the LEAP programme, one of the most successful in the industry, is a fantastic opportunity for HAL." Safran Aircraft Engines, along with other Safran entities, has a significant presence in India. The country ranks as the third-largest operator of LEAP engines globally, with 75% of Indian commercial aircraft equipped with CFM's advanced turbofan technology.

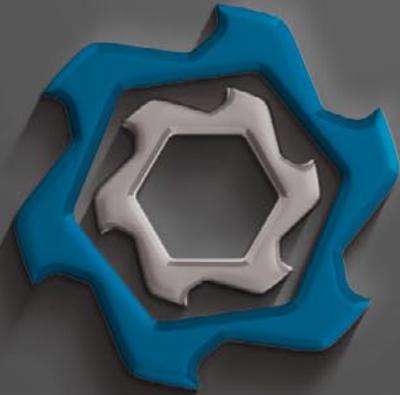


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## EFW's latest freighter conversion site in Türkiye commences operation



EFW's latest freighter conversion site in Türkiye commences operation with the first A330P2F induction

© EFW

Elbe Flugzeugwerke GmbH (EFW), centre of excellence for Airbus passenger-to-freighter (P2F) conversions, has commenced operation at its new third-party freighter conversion site in Istanbul, Türkiye, after its first A330P2F was inducted as scheduled in October. This new Istanbul site is set up in collaboration with Turkish Technic, a leading MRO company certified around the world as Part 145 and Part 21 J&G organisation. With the Istanbul site, EFW has a total of nine modifications sites carrying out its conversion programmes across the globe. "We are glad to get Turkish Technic on board, which has

deep experience in maintaining Airbus aircraft," says Jordi Boto, CEO of EFW. "By working with partners which have strong structural skills and operational excellence, we will ensure meeting our customer commitments in a robust manner." EFW's A330P2F programme is developed in collaboration with ST Engineering and Airbus, with EFW holding the supplemental type certificate and leading in the overall programme as well as marketing and sales efforts. To meet the strong demand for Airbus freighter conversions, ST Engineering and EFW have set up conversion sites in Asia, the U.S. and

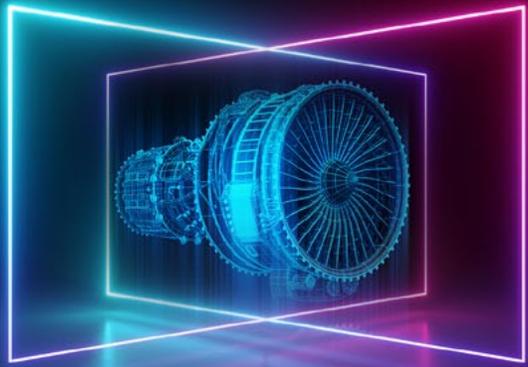
Europe to ramp-up conversion capacity for all their Airbus P2F programmes comprising the A330P2F, A321P2F and A320P2F conversions. The A330P2F programme comes with two variants – the A330-200P2F and A330-300P2F – which are both equipped with advanced technology that offers airlines additional operational and economic benefits. The A330-200P2F can carry a gross payload of up to 61 tonnes of weight to over 7.700 km, while the larger A330-300P2F can carry a gross payload of up to 63 tonnes and a containerised volume of up to ~18.581ft<sup>3</sup> (~526m<sup>3</sup>).



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Jonghoon Oh, Korean Air and Clotilde Enel-Rehel, Collins Aerospace, have signed an agreement to equip Korean Air's Boeing 787 fleet with Ascentia® © Collins Aerospace

Collins Aerospace has released that Korean Air will use Collins Aerospace's Ascentia® Prognostic and Health Management (PHM) solution on its growing Boeing 787 fleet. "Ascentia's ability to monitor the health of a wide variety of components on our Boeing 787 fleet will help us improve reliability by predicting potential issues before they occur," said Jonghoon Oh, General Manager - Predictive Maintenance Team, Korean Air. "By tailoring Ascentia to our specific requirements, it will further improve our predictive and preventative maintenance operations, giving our passengers an even more reliable travel experience." The cloud-based solution uses advanced data analytics and machine learning algorithms to help airlines improve maintenance operations and increase

aircraft reliability. Analysing flight data and maintenance records in real-time allows Ascentia to help predict potential maintenance issues and provide recommendations for corrective actions, improving aircraft availability and reducing unscheduled downtime. "Ascentia is designed to help airlines improve their customers' experience," said Clotilde Enel-Rehel, Executive Director for Customer Programmes at Collins Aerospace. "Our data-driven solution will provide Korean Air with predictive maintenance recommendations to optimise its schedule and improve its operational efficiency." Collins Aerospace's Ascentia solution is currently in use by several major airlines around the world. Equipping KAL's Boeing 787 fleet with Ascentia represents a significant milestone as Collins Aerospace expands its presence in the Asia-Pacific region.

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## Ontic invests in engine fan product lines from Curtiss-Wright



Ontic has signed a license agreement for fan products from Curtiss-Wright's Sensors Division © Ontic

Ontic, a leading licensor and manufacturer of complex engineered parts for the global aerospace and defence industries, has signed a license agreement for fan products from Curtiss-Wright's Sensors division. The high-performance fans and blowers are used on commercial and military platforms to provide cooling to key systems. Currently manufactured at Curtiss-Wright's Sensors Division's site in Gilbert, AZ, this product line will transition to Ontic's recently refurbished Chatsworth facility in California. Making use of its existing and extensive manufacturing capability, sitting alongside other highly engineered fan and blower technologies, as well as other complementary product

lines. Gareth Blackbird, Vice President and Chief Commercial Officer at Ontic, explained: "We're very pleased to be bringing this significant license investment to our Chatsworth facility in California, where we continue to invest and grow following recent investment and refurbishment of the facilities. Ontic has long been a partner of Curtiss-Wright and we're pleased to bring new investment to this product line." Investing in the future of divested product lines such as these is where Ontic excels and adds value, ensuring the aircraft of today can continue to operate with a robust spares, maintenance and repair support pipeline.

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## FAA approves TAM's easy-to-install LPV-modification for Saab 2000

TAM, Täby Air Maintenance, has developed a smart and easy-to-install LPV-modification kit for the Saab 2000 (LPV – localizer performance with vertical guidance). The LPV- or RNP-approach-equipped aircraft will be mandatory in Europe in early 2024. TAM's LPV-modification was certified by EASA on August 10, 2023, and now also by the FAA on October 25, 2023. The modification package, developed in-house

in collaboration with Canadian CMC Electronics, is tailor-made for the Saab 2000 and allows the cockpit layout to remain virtually unaltered, utilising current screens. New annunciators from Applied Avionics and nav-database update equipment from Advance Interface Technologies. When installed, modified aircraft will be able to make high-precision approaches to any airport, where older ILS-systems have been replaced with a GPS-based LPV solution

due to cost. Beginning this spring, the first system has been the subject of extensive live testing in a Saab 2000, equipped with a Collins Proline 4 system. As the first compliance flight tests were successfully performed, a parallel EASA-/FAA-certification programme has been ongoing, with the final EASA test flights done early this summer. Following the EASA certification, the corresponding FAA validation has now been performed.

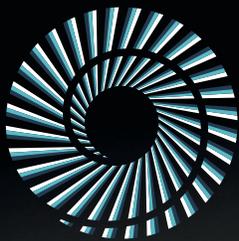
## Aquila Air Capital closes US\$100 million financing

Aquila Air Capital (Aquila), a leading lessor focused on end-of-life solutions, has announced the successful closing of a US\$100 million (£83 million) financing. The financing is aimed at increasing Aquila's ability to deliver bespoke lease solutions for passenger and cargo operators across the globe. "We are thrilled to announce the successful closing of this new credit facility. It will enable us to further our mission of being a trusted partner to all players in the value chain, from buyers and sellers of aircraft assets to operators," said Al Wood, Aquila Air Capital's Chief Executive Officer. Deutsche Bank acted as sole structuring agent and underwriter for the financing. Since the lessor's inception in 2021, Aquila has been focusing on end-of-life aircraft transactions and has amassed a portfolio of 65 aircraft and engine assets on lease to more than 20 customers globally.

"We're building a world-class customer-centric organisation that is uniquely positioned to provide a wide range of bespoke leasing solutions for complex transactions. We appreciate the strong support from our investor and lender base; it reflects the market's confidence in the outlook for our industry and Aquila's operations," Wood added.



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Line Maintenance Mechanics.  
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# Managing Idle Times in Line Maintenance

Mechanic idle times are a significant cost factor in aircraft maintenance

By Heike Tamm

**M**anaging the productivity of line maintenance aircraft mechanics can be a complex and challenging task due to the unique nature of the aviation industry and the critical role these professionals play in ensuring flight safety and technical punctuality.

## The Challenges

The workload for line maintenance aircraft mechanics is highly variable, depending on factors such as flight schedules, aircraft maintenance requirements, and unforeseen issues. Especially during the day, in a typical narrowbody operation, more capacity is available than is necessary because all aircraft are in operation. Airlines are using sophisticated shift systems to try to shift more capacity into the night when aircraft are not in use. Idle time costs are a significant factor in calculating the real cost per productive hour.

Allocating the right number of mechanics to handle the workload

efficiently is a constant challenge. Understaffing can lead to overworked mechanics and decreased productivity, while overstaffing can lead to idle times and increased labor costs. Ensuring that mechanics have the necessary skills and experience to handle a wide range of maintenance tasks is essential. Newer mechanics may require supervision and guidance, which can affect overall productivity until they gain experience. Maintaining a workforce with the necessary certifications and qualifications can be challenging. Ensuring that mechanics stay current with their certifications through ongoing training programs is essential but may require time away from regular duties.

Airlines often operate a diverse fleet of aircraft, each with its own maintenance requirements, systems, and components. Mechanics must be knowledgeable about various aircraft types, which can be demanding and require ongoing training. Unforeseen issues and emergency

repairs can disrupt planned maintenance schedules. Mechanics must be prepared to handle unexpected situations, which can affect productivity and require adaptability.

The aviation industry is heavily regulated, with strict safety and maintenance standards enforced by aviation authorities. Meeting these regulatory requirements adds complexity to maintenance tasks and can affect productivity due to the meticulous documentation and compliance checks needed.

Aircraft maintenance often has strict turnaround times, especially for quick turnarounds between flights. Mechanics are under pressure to complete tasks efficiently without compromising safety, which can be challenging when dealing with complex systems.

Mechanics rely on a variety of tools, equipment, and spare parts to perform their tasks. Delays in the availability of these resources can disrupt maintenance schedules and hinder productivity.



Checking landing gear in between flights.  
© Shutterstock

### Best Practices to Increase Line Maintenance Productivity

Idle times offer an excellent opportunity to invest in the continuous training and development of line maintenance aircraft mechanics. Aviation technology is continually evolving, and mechanics must stay updated with the latest advancements in aircraft systems and maintenance procedures. Offering regular training sessions during idle periods not only enhances the skills of the workforce but also ensures that mechanics remain current with industry standards and best practices.

Cross-training mechanics to perform tasks beyond their primary responsibilities can be a valuable practice during idle times. For example, mechanics can be trained in quality control or administrative tasks related to aircraft maintenance records. This diversification of skills allows

for greater flexibility in staffing and resource allocation, reducing the impact of workforce shortages.

Aircraft mechanics rely on various tools and equipment to perform their tasks efficiently and safely. During idle times, it is advisable to schedule routine maintenance and inspection of these tools. This practice can prevent unexpected breakdowns and ensure that all equipment is in good working condition when needed. Well-maintained tools and equipment contribute to a smoother workflow and reduce downtime caused by equipment failures.

Aircraft maintenance requires an inventory of spare parts and components. Idle times provide an opportunity for mechanics to review and manage inventory levels. They can assess which parts are in surplus, which are running low, and which need replacement. Effective

inventory management can reduce the time spent searching for parts during critical maintenance tasks and help streamline the maintenance process. Many maintenance companies also employ mechanics in logistics. For example, a mechanic may work in the receiving department when there is no maintenance work on the aircraft.

Managing idle times among line maintenance aircraft mechanics requires a proactive and strategic approach. By implementing best practices, airlines and maintenance teams can make the most of downtime, ultimately enhancing productivity, safety, and the overall efficiency of their operations. It is essential to strike a balance between maximizing productivity and ensuring that aircraft maintenance remains at the highest standard of quality and safety. With careful planning and the right strategies in place, idle times can become opportunities for growth and improvement in the aviation industry.

“Idle time costs are a significant factor in calculating the real cost per productive hour.”

The background image shows a male technician in a red polo shirt, black cap, and safety glasses working on a large aircraft engine. He is holding a flashlight and looking intently at the engine components. The scene is set in a maintenance hangar with yellow overhead structures.

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Training apprentices at AFI KLM E&M.  
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# Maintenance training – appealing to **future generations**

How the development of aircraft maintenance training and the introduction of modern training technologies is helping to address the scarcity of maintenance technicians.

By Mario Pierobon

**A** The effectiveness of aircraft maintenance training is of paramount importance in the current business landscape characterised by a scarcity of technicians and the retirement of baby boomers. Effectively implementing aircraft maintenance training requires a structured approach and process. In this feature, we have reached out to industry experts to define best practices for aircraft maintenance training development, the impact of developing training technologies, and strategies to make aircraft maintenance training appealing to future generations of professionals.

## **Best practices for training development**

Aircraft maintenance is precise engineering, and it is a highly technical and

vital aspect of the aviation industry. It is guided by regulations, standards, quality assurance requirements and partnerships with original equipment manufacturers (OEMs) and other vendors within the industry, observes Emirates Engineering. "Training in aircraft maintenance, therefore, needs to be equally stringent to ensure these standards and regulations are adhered to. Aircraft types, technologies and various technical aspects are also constantly changing or being updated, so it is absolutely critical that training keeps pace with these changes to ensure it develops talent the right way, aircraft remain safe, and aviation continues to be a solid industry with a great reputation".

Aircraft maintenance training provides the technical skills within the regulatory frameworks, and it is complex as it

needs to meet the objectives of the engineering teams, the vision of the airlines, requirements set by regulatory frameworks, and the ambitions of the countries where airlines are based, affirms Emirates Engineering. "We stringently follow regulations laid down by the UAE's General Civil Aviation Authority (GCAA). Our basic aircraft maintenance engineering licencing (AMEL) training programme for UAE Nationals is approved by the UAE-GCAA and all the accompanying material is based on its regulations".

The timeframe to perform all necessary tasks during standard line maintenance for basic aircraft maintenance training is, on average, approximately two years, observes Lufthansa Technik. "To get this on-the-job training (OJT) done, we have developed a programme that is approved by the German



OJT training

© Lufthansa Technik

Aviation Authority whereby the participants, in less than two months, perform all necessary tasks, in the correct mixture of ATA chapters, depth of work and number of tasks to fulfil the requirements”.

Upon completion of the OJT, the participants are able to perform a variety of aircraft maintenance tasks, explains Lufthansa Technik. “These tasks include applying relevant safety precautions, identifying and applying aircraft technical documentation, naming, identifying and locating aircraft system components, performing normal operation of aircraft systems and sub-systems, performing servicing, and performing system functional tests and on-board maintenance system supported tests. Additional tasks include carrying out routine thorough visual checks, describing component removal/ installation procedures unique to the aircraft type, determining aircraft airworthiness in accordance with the minimum equipment list (MEL)/configuration deviation list (CDL), explaining maintenance procedures according to the MEL, and correlating information for the purpose of making decisions in respect to fault diagnosis and rectification.”

Teaching maintenance personnel involves not only the passing on of professional experience, but it also assumes the mastery of techniques in the field of

teaching, highlights Jiri Jahoda, head of maintenance training at Czech Aviation Training Center (CATC). “The training is preceded by extensive preparation with the elaboration of a presentation that includes a progression from the simplest description of entire systems to a detailed description of individual components”, he says. “Various methods such as assisted learning, demonstrations, e-learning or multimedia training and various teaching aids such as visual technology, PC educational systems, simulation trainers or individual components are used for the training”.

A recognised best practice in aircraft maintenance training development is the ongoing commitment to programme

“Technologies have expanded and improved rapidly over the last decade.”

*Lufthansa Technik*

enhancement, affirms Algirdas Kadaksys, deputy chief executive officer (CEO) for technical training at FL Technics. “This involves regular and systematic reviews of training programmes to incorporate any updates or recommendations provided by aircraft manufacturers”, he points out. “Furthermore, a crucial aspect of this process entails attentively considering and integrating feedback garnered from both students and instructors. This responsive approach to input allows us to align our training offerings as closely as possible with the evolving demands of the aviation industry, within the constraints of our regulatory framework”.

**Development in training technologies**

Technology has changed every sphere of human life, and it has certainly enabled a huge transformation in the aircraft maintenance training space, according to Emirates Engineering. “Today, virtual reality (VR), synchronous distance learning training and augmented reality (AR) are being integrated into aircraft maintenance training to provide more immersive and realistic training environments. The aviation industry



New technologies have revolutionised training

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Practical training at Lufthansa Technik

© Lufthansa Technik

training tools also allows one to change the training methods, i.e., moving part of the training to an online environment or to increase one's own experience by simulating activities on synthetic equipment. This improves the quality of training and, through personal experience, the skills, and techniques necessary to improve safety when working on a real aircraft. Preparing for the use of new aviation technologies in training is demanding not only in terms of expertise and time, but also financially. To make maintenance training attractive, it is necessary to involve the participant in the learning process so that the new technology provides a new experience that is similar to reality and the participant gains knowledge in a pleasant way," he adds.

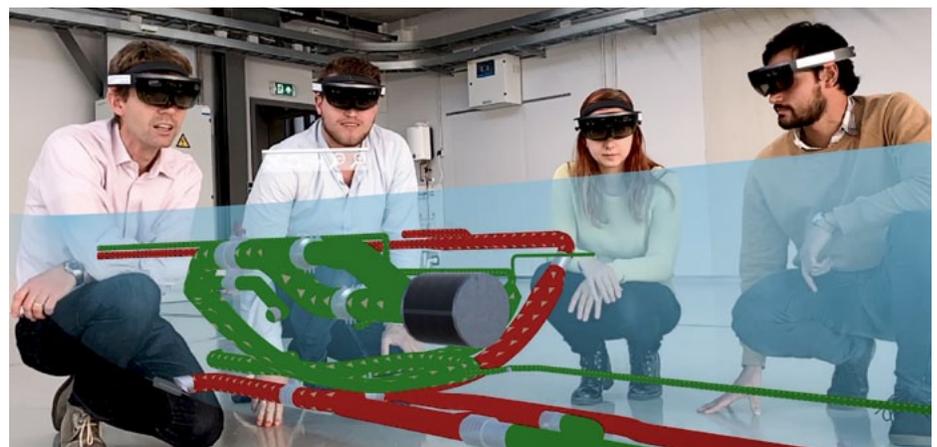
Immersive technologies, maintenance simulations and also cost-efficient solutions such as Panoramic Viewer play a significant role in maintenance training nowadays, observes Lufthansa Technik. "Young trainees and maintenance organisations alike indeed expect modern training methods and digital methods to support their learning journey. We adopt digital technologies as all trainees are equipped with tablets, easy access to literature, aircraft maintenance simulations and overviews through their learning management system", says Lufthansa Technik. "We enhance our training as much as possible with digital technologies and are currently working on an immersive technology solution to improve the training. Nevertheless, practical training on aircraft, engines and components as well as learning basic hand skills is key and is not being

has increasingly moved toward digital and remote training solutions, especially in response to the challenges posed by COVID. We are approved to conduct both type (EASA & GCAA) and basic (GCAA) training, employing distance learning training methodology, which is a synchronous virtual learning method, where instructors and students interact in real-time," says Emirates Engineering.

Air France Industries KLM Engineering & Maintenance (AFI KLM E&M) observes that, at the moment, best practices for aircraft maintenance training development revolve around interactive training in the classroom. "The training we are developing is old-style theory supported by immersive technology, like VR, HoloLens, simulators, and haptics. The students receive the required information and instructions which can be practiced in the digital environment", AFI KLM E&M says. "The available training technologies have expanded and improved rapidly over the last decade. The improvement is in quality of images which are getting more realistic and user friendly,

but also the interaction with feeling (haptic glove) in the digital environment. In the future a realistic digital environment will be available where training can be simulated as working in the 'real world'".

With the development of new technologies, training tools such as simulators and virtual reality are indeed being improved and expanded, affirms CATC's Jahoda. "The improvement of



AFI KLM E&M Training

© AFI KLM E&M

## TECHNICAL TRAINING

replaced by digital features. At the end of the learning objectives shall be the focus to determine the right methodology of training. Nevertheless, we strongly believe that new technologies will further evolve and enhance technical training”.

Appealing to future generations

Aircraft maintenance is one of the most critical segments within aviation, as one can buy the latest and best aircraft, but will always need it to be regularly maintained, certified, safe at all times, and in mint condition every single day, observes Emirates Engineering. “This is why attracting talent, shaping careers, specifying a growth path, and training future generations in aircraft maintenance is key to the growth and sustainability of the airline industry. To attract the right talent and appeal to upcoming generations, training teams need to understand the needs, motivations and preferences of future employees and students”, says Emirates Engineering.

CATC’s Jahoda observes that adult education involves both older and younger students, who show differences in their perception of the content. “They are all motivated by social and professional pressures, but the ability to learn is influenced by ‘professional memory’, motivation and the ability to concentrate”, he says. “Older participants show a criticality that comes from their experience, they want practical answers and information and do not like to waste time. Younger participants, on the other hand, are more receptive to the use of new technologies but do not like to learn the necessary basics, norms, and definitions”.

Some key points to make aircraft maintenance training appealing to future generations are career advancement opportunities, cutting edge training tools, continuous learning, and digital learning platforms, says Emirates Engineering. “It is important to communicate the potential for career growth and higher benefits within the aircraft maintenance field, to keep training



On the job Training

© AFI KLM E&M

fresh and updated, to use state-of-the-art technology - including VR, DLS and AR - to create engaging and immersive training experiences, and to use interactive digital learning platforms allowing students to access and engage with course materials online”, says Emirates Engineering.

Training in the future must be in line with the development of the new techniques and maintenance philosophies, matching the learning needs and expectations of the students, affirms AFI KLM E&M. “The new techniques on the horizon involve electricity or hydrogen instead of fossil fuel. The maintenance philosophy will move from inspection and rectifying if damaged to data-driven and predictive maintenance programmes, like PROGNOSE,” says AFI KLM E&M.

The new generations of students are setting the bar higher. As they are accustomed to today’s technology, they expect a modernised approach to learning, observes FL Technic’s Kadaksys. “They crave higher-quality graphics, favour coloured illustrations over traditional blueprint schematics, demand interactive 3-D models, and seek a wealth of instructional videos. Their desire for more visually engaging and interactive content reflects the evolving technological landscape and the need for a

dynamic learning experience,” he says.

To make aircraft maintenance training appealing to future generations of professionals and adapt it to new technologies, eLearning can be an effective solution, according to Lufthansa Technik. “We have developed eLearning modules for the complete Part-66 syllabus which are interactive, engaging, and visually appealing. We have gamified the training by adding elements like quizzes, challenges, and rewards by the instructor-led classroom, and created mobile accessibility that allows students to learn on the go and at their own pace, which is particularly appealing to the younger generation”, says Lufthansa Technik. “We have also created individualised learning paths for students with regular updates and, by integrating these elements into eLearning with web-based training, we make aircraft maintenance training more appealing and effective for future generations of professionals while addressing the evolving needs of the aviation industry”.

In the field of aircraft maintenance training, the ultimate priority for the students is competence, according to Kadaksys. “What truly appeals to them is the presence of a seasoned and proficient instructor who can impart not only knowledge but invaluable hands-on experience. Regardless of a student’s age or familiarity with new gadgets, the expertise and genuine dedication of an instructor are irreplaceable”, he concludes.

“The new techniques on the horizon involve electricity or hydrogen instead of fossil fuel.”

AFI KLM E&M



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# Used serviceable material – a challenging market

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Delivery delays in new aircraft and ongoing supply chain problems create continued challenges.  
By David Dundas

Supply and demand are the two principal factors that affect the price of any product. However, because outside agents can have a considerable effect on either of these factors, today's challenges for tear-down companies and those involved in trading USM are exacerbated by both delays in the delivery of brand-new aircraft together with supply chain issues. We have spoken to five of the major players operating in the aircraft tear-down and used serviceable material market to get a better idea of how they are dealing with such a challenging period in the aviation industry.

## Today's trends in the USM market

It is clear that aircraft availability and the timely supply of USM are two of the greatest challenges currently being faced by many operatives. According to Scott Symington, COO of AJ Walter Aviation Ltd. (AJW), "Delays associated with new-generation platforms such as the NEO and the MAX, combined with the

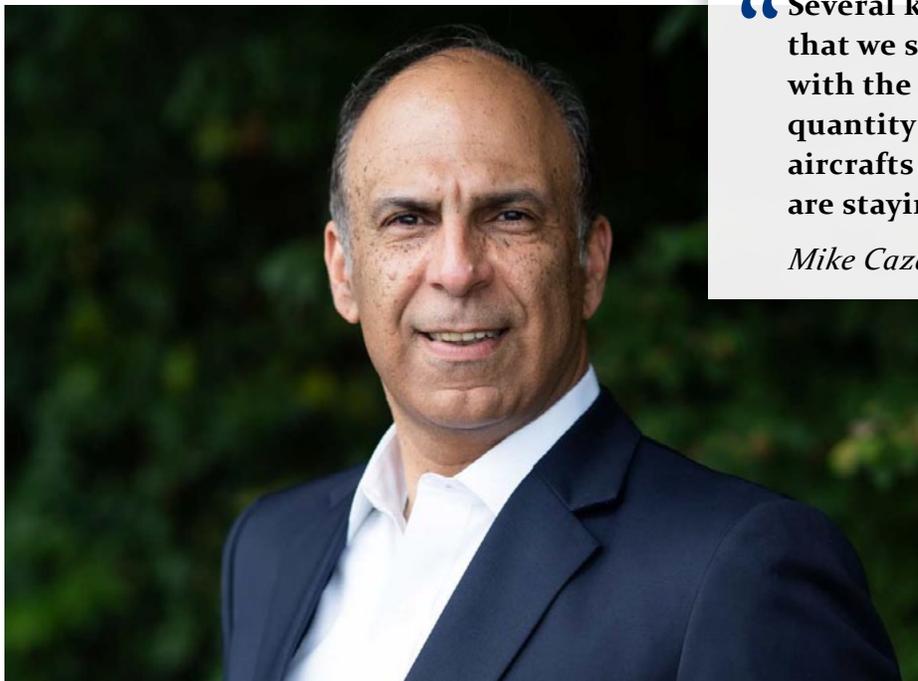
current high demand post-covid era, have led to fewer aircraft being retired, as operators are holding on to aircraft much longer than before or are using the aging fleets for additional capacity. The result is reduced available inventory to part out, which means the demand for USM has dramatically increased for older

aircraft. The prolonged operation of these ageing fleets means their maintenance checks still need to be done and we may not have seen this in the past. When you combine this with the ever-present supply chain issues and skilled labour shortages post-covid, we see an increased demand for used material that is significantly out of balance with the available supply."

AerFin's SVP EMEA Mark Shimizu has identified inventory as a key point of focus in the current climate. "As a result of the current supply chain challenges, repair TATs have increased across the board (engine component repair TAT's have increased notably in particular where we are experiencing the most notable impact), driven mainly by manpower shortages and piece part/raw material production delays. 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," he reports.



Scott Symington, Chief Commercial Officer at AJW



Mike Cazaz, President & CEO of Werner Aero

Ascent Aviation Services' Scott Butler comments: "As OEM supply chains remain very strained with the new aircraft ramp-up, we're seeing a lot of up ticks in USM usage post-COVID. This is spurring demand for more teardowns across regional, wide- and narrow-body platforms as USM becomes a necessary alternative."

Mike Cazaz, Chairman and CEO, Werner Aero LLC and GA Telesis' President & CEO, Abdol Moabery are of similar minds and see a more classic consequence of aircraft remaining longer in service than anticipated. "Several key factors contribute to the issues that we see right now due to global problems with the new generation of engines, large quantity of airplanes grounded, and used aircrafts scheduled to come out of service are staying longer in service. This has started to affect the availability of used spare parts in the market with fewer aircraft teardowns. This causes a significant shortage of parts in some areas which causes prices to go up because the demand is high. Still some global supply chain problems starting at the OEM point failing to deliver new components to repair used parts causing the used parts to remain at the MRO

facility for many months instead of days. These situations are indeed a reflection of the challenges faced by the aviation industry: Low supply and high prices of items that are readily available," Cazaz comments. Moabery has found that: "... because of the issues related to new aircraft delivery delays, there has been a reduction in aircraft retirements and, therefore, a lesser amount of USM availability. This has pushed pricing upwards because, notwithstanding the higher prices, it is still less costly than new replacement parts. Finally, because more mid-life aircraft are flying, there is a greater demand for USM."

### Challenges facing the USM market

When it comes to challenges faced by the USM market, once again aircraft retirements seem to be key to the problem. GA Telesis' Moabery is quite clear that: "In the current market, there is a ton of demand for USM, but the number of aircraft retirements, which are ultimately feedstock for USM providers, has reduced significantly. Our forecasts a few years ago predicted about 1,000 aircraft retirements in 2023, moving up as high as 1,400 in 2025. The numbers will look more like 400 in 2023, and

“Several key factors contribute to the issues that we see right now due to global problems with the new generation of engines, large quantity of airplanes grounded, and used aircrafts scheduled to come out of service are staying longer in service.”

*Mike Cazaz, Chairman and CEO, Werner Aero*

it will take the market four to six years to catch up. Vallair's Director of Material Management, Armando Filho is more succinct, stating that: "The main challenges will always be back-to-birth traceability for all components, NIS (non-incident accident statement), and physical condition. Vallair's USM focus is always on reliable items to guarantee best value for money for customers."

Scott Butler at Ascent Aviation is of the opinion that TAT for used material is critical at the moment. "The supply chains are still very strained in the MRO networks. Even after your material has been removed from the aircraft, the turnaround times at repair organizations are still very challenging, he comments.

Scott Symington at AJW sees a number of challenges at present. These range from inventory management to procurement, with particular emphasis on the latter. "The Group employs



Abdol Moabery, President & CEO GA Telesis

diverse channels for the procurement of its inventory, each with distinct risk and reward profiles, carrying varying degrees of potential surplus inventory. Some components may not be suitable for harvesting, and those with a lower demand profile may take time to trade. Even the components expected to be traded quickly come with an inherent risk, as their condition remains unknown until removal and inspection at a repair facility. You might dispatch a component presumed to be valued at \$30,000 on the aircraft, only to find it declared as BER (Beyond Economical Repair) and subsequently scrapped. In essence, this approach entails a bigger risk, albeit with the possibility of greater reward, particularly if the part can be repaired. It also carries a greater likelihood of accumulating surplus inventory, as slower-moving items are acquired alongside the more highly traded ones. Conversely, procuring individual parts selectively from specific suppliers or via trading platforms involves lower risk but correspondingly lower returns. This method is less likely to contribute to surplus inventory, as it entails the purchase of only those specific parts required for servicing contracts or those expected to be in high demand," he states, adding that "The challenge comes



Mark Shimizu, Senior Vice President EMEA at AerFin

in striking the right balance between these distinct styles of procurement, aiming for optimal returns on investment whilst maintaining a lean inventory pool and minimising surplus stock holdings."

AerFin's Mark Shimizu feels that there have been: "... unprecedented increases in repair costs over 2022 and 2023 as OEM's seek to insulate themselves from increased production costs caused by both global and local cost escalations. These escalations have been driven by many factors including price spikes in the energy and fuel markets, the post-Covid recruitment driving up new employee salaries, national interest rates and

inflation increases." Additionally matters have not been helped by global conflicts, suggesting that: "The current situation in Ukraine has had a major financial impact across the globe and is evidence of how action in one country can truly resonate across the globe."

### Pricing dynamics and cost considerations

For buyers and sellers alike, pricing of USM is critical, Today's volatile economic environment together with reduced availability of certain aircraft seems to be exacerbating the challenges. Ascent Aviation's Scott Butler is quite succinct: "TAT is driving everything. The more value you can add to your inventory with repair and quality inspection, the more likely you are to get the sale at a favourable price point." Werner Aero's Mike Cazaz is more reactive in his approach as opposed to proactive. "We are in a unique environment now that could last for another 12-16 months. Prices fluctuate every single day sometime by a hundred percent, and it is all subject to availability and ready to go materials," he comments.

Though clear that supply and demand is a key dynamic, AJW's Scott Symington is also aware of the criticality of cost consideration. He states that: "Pricing is heavily influenced by supply and demand. When demand for specific aircraft materials or components is high and the supply is limited, prices tend to



Part out of aircraft.  
© Ascent Aviation



© Ascent Aviation

teardown and what factors need to be given careful consideration?

Kyle Goodfellow, VP Pricing at AerFin has identified five key areas that affect aircraft selection - demographics, addressable market, geography, market demand, and the repair network. From evaluating the number of aircraft in service and the distribution of aircraft by age through to market demand, but particular interest is taken with the repair network. Lastly, the Repair Network assumes a pivotal role in the aircraft selection process for teardown. Factors under consideration include the dominance of the repair network by OEM or the presence of independent Maintenance, Repair, and Overhaul (MRO) shops. Our evaluation also extends to the strength of our relationships with these entities and the competitiveness of the rates offered. These aspects directly impact repair costs, turn-around times (TAT), and, consequently, influence our acquisition model," Goodfellow explains, while adding that: "The addressable market constitutes a vital aspect of our comprehensive review process. Here, we identify key players in the markets, distinguishing between those affiliated with Original Equipment Manufacturers (OEM) and independent entities."



Kyle Goodfellow, Vice President Pricing at AerFin

surge. Conversely, in times of reduced demand and ample supply, prices may decline. The intrinsic value of particular components also plays a role; items like engines or avionics systems often command higher prices due to their complexity and essential role in aircraft operation. However, market conditions, economic fluctuations, and external factors such as fuel prices all exert an influence on pricing," adding that: "Cost considerations are equally important. Buyers must assess acquisition costs, for example, things such as purchase prices, inspection fees, and transportation expenses. There are costs involved in overhauling used materials to meet safety and quality standards, a concern shared by both buyers and sellers. Logistics expenses tied to material transportation, market fluctuations, regulatory compliance costs, and the ongoing expenses of ownership, including storage and insurance, also have an impact."

AerFin's Mark Shimizu is keen to point out that remaining green time for engines is proving critical, especially in a market where there has been a delay in aircraft retirements. He notes that: "We are observing high prices paid for any remaining green time within assets. Piece-part pricing is also firming up due to fewer aircraft entering the market and increasing repair costs, which are

driving up values. With fewer assets available for part-out and no significant expected market improvements over the next few years, asset buyers are adopting a more aggressive stance on forward pricing and purchasing, factoring in the expectation that OEM price escalations will persist in the foreseeable future. In our sector, the anticipation of the 'bow wave' of retirements has continuously been postponed. Consequently, sellers of aircraft need to keep a cautious eye on this scenario in the coming years and determine the optimal time to trade assets to avoid any downward spirals in asset values resulting from increased supply."

Vallair's Armando Filho sums the situation up in a nutshell – "Basically, the pricing dynamics are related to a certain percentage of the price list and historical market price aligned with back-to-birth traceability and condition versus demand. Together these factors determine the pricing dynamics and baseline for any negotiation."

### Choosing the right aircraft

Selecting the right aircraft for teardown can be an even greater challenge today with fewer older aircraft being taken out of service. So, what are the options available to operators when it comes to choosing the right aircraft for



Armando Filho, Head of Material Services & Quality Assurance EMEA, Vallair

Vallair has two age criteria depending on whether they are looking at commercial passenger or cargo aircraft. Armando Filho comments that: "When looking for teardown aircraft Vallair considers assets that are younger than 20 years old for the commercial passenger market, and younger than 30 years of age for the cargo market. Selection criteria will vary according to the aircraft's physical condition, back-to-birth traceability and price. If you have green time available on key components, then the opportunity to secure better and faster deals increases."

Scott Symington at AJW sees the landscape slightly differently, with age being the key. "... the age of an aircraft is a significant consideration. As aircraft age, they can become less cost-effective to operate and maintain, prompting airlines and lessors to retire them. This leads to a surplus of older aircraft, making them attractive candidates for teardown. Aircraft that have been well-maintained and remain structurally sound are more desirable for teardown because their components are likely to be in better condition and have higher market value. The aviation industry continually requires spare parts to support its fleet, and the demand for specific components

“When looking for teardown aircraft Vallair considers assets that are younger than 20 years old for the commercial passenger market, and younger than 30 years of age for the cargo market.

*Armando Filho, Director of Material Management, Vallair*

can influence the selection of an aircraft. Additionally, regulatory compliance, ownership and lease agreements, manufacturer and model characteristics, and economic factors, such as fuel prices and passenger demand, all play a role in the decision. Proximity to teardown facilities and skilled personnel also affects teardown feasibility," he states.

Ascent Aviation's Scott Butler concurs with the idea that age is critical. "Age and market are definitely driving most of the teardowns. Widebody aircraft were slower to return to flying post-COVID, however, we've seen strong demand for A330s of all ages. The increase in P2F programmes is also helping new markets emerge," he comments. In a similar, but more specific vein, Werner Aero's president and CEO, Mike Cazaz has his eye on younger aircraft, saying that: "From Werner's point of view our objective is to buy an aircraft that is younger than 15 years simply because the aircraft that are older contain parts that are less desirable in the market. Our expertise and focus rely on the areas of narrowbody aircraft and regional jets in particular A320, B737, and E-jet aircrafts. These three platforms are most commonly used by airlines worldwide."

### High-value teardown assets

With an aircraft teardown, clearly there are certain assets which are of greater value such as landing gear, engines and avionics. The question is, how do individual MRO enterprises deal with these valuable components, as they can make or break a successful teardown? What happens to them once they have been removed and prepared for resale?

AJW's COO, Scott Symington provides an invaluable insight, revealing just how complex this task can be and

highlighting key requirements that have to be met. "There is an initial asset value appraisal of the aircraft and valuation of the remaining green time followed by an assessment of the condition of the aircraft. We then derive the potential harvest list and use both historic data and current repair costs and FMV analysis to build the business case and ROI of the asset investment. We then carry out a full aircraft and records audit to establish the maintenance history and the potential for aftermarket resale of the parts. The team then begins the disassembly, beginning with the removal of external parts and then moving internally to components, systems, avionics, and other high-cost equipment while cross-referencing the associated paperwork and maintenance history of each component from the harvest list. Once this is done, components are inspected and assessed for possible reuse, after which those that can be used in the aftermarket are labelled and catalogued into an inventory tracking and location system. Items that will be reused are then overhauled according to industry standards and may be tested and recertified to meet requirements. Here we utilise our extensive network of approved MRO suppliers, including our own state-of-the-art facility in Montreal, AJW technique, to ensure components are inspected, and repaired/overhauled to the latest standards and turnaround times are kept to a minimum, he explains.

According to Abdol Moabery at GA Telesis, getting parts recertified is vital, making clear that: "All parts, regardless of utility and nomenclature, need to be recertified by a licensed MRO or the OEM. There are published guidelines related to how this is done. One key variable is

## SUPPLY CHAIN

how the parts are stored and preserved between the time they are removed from an aircraft or engine and recertified. Then, there is a whole other process once the parts are recertified and put on the shelf awaiting use. If this is not done properly, then it causes extra steps in the maintenance process, which can be quite costly.” One clearly identified factor that is unavoidable, and that is the part-value balance, as Vallair’s Armando Filho makes abundantly clear: “Using the Pareto analysis, usually the 80% of the value resides in 20% of the parts these are: engines, APUs, landing gears, nacelles, THSA (Trimmable Horizontal Stabilizer Actuator), RAT (Ram Air Turbine), avionics, engine mounts, escape slides, wheels, brakes, flaps, slats, elevators, etc., these can provide short to medium term returns, the remaining parts can take longer to be sold.”

AerFin’s Teardown Manager, Cameron Jones goes into great detail on this particular aspect of aircraft teardowns. He is particularly keen to point out the responsibility of creating a trustworthy partnership with disassembly partners. “Focus on attention to detail with regards to removal and preparation of high value components such as Engines, Avionics, Landing Gears and Nacelles is enormously important to AerFin as a business, as these assets contribute considerably to the onward sales value. Having the trust in our disassembly partners to remove, prepare and crate such assets with great care and to pre-specified requirements is imperative. As a business, we target closure of asset sales to be located with AFRA accredited facilities. These AFRA certified facilities offer an accreditation program based on best management practices to ensure all components are removed in a safe, efficient and environmentally friendly manner, whilst mitigating any damage to the assets to ensure AerFin realise maximum value from our investments. We request from all crates be manufactured to ISO standards which uphold our ASA certification. These standards ensure the safe packaging for onward international transportation to our customers, vendors or multiple worldwide



Cameron Jones, Tear Down Manager at AerFin

“**Focus on attention to detail with regards to removal and preparation of high value components such as Engines, Avionics, Landing Gears and Nacelles is enormously important to AerFin as a business.**”

*Cameron Jones,  
Teardown Manager, AerFin*

warehouse facilities,” he explains.

Mike Cazaz at Werner Aero is keen to point out that while disassembling an aircraft may be one challenge, the safe and secure transportation of the high-value parts is vital. He explains that: “Engines and landing gears are the most expensive parts in an aircraft, so they require special care and knowledge while removing them. First, they get tested while still installed in the aircraft. Then they must be removed by expert technicians and placed in the proper shipping container. Engines get removed first and must be placed on proper engine stand to protect and transport them. Landing gears must be properly placed in shipping crates per OEM guidelines for proper shipping. We do that to avoid irreversible damage to the assets. Avionics are removed just like any other part on the aircraft but must be packaged with the proper material to prevent discharge then packed and shipped in a proper avionics’ container.”

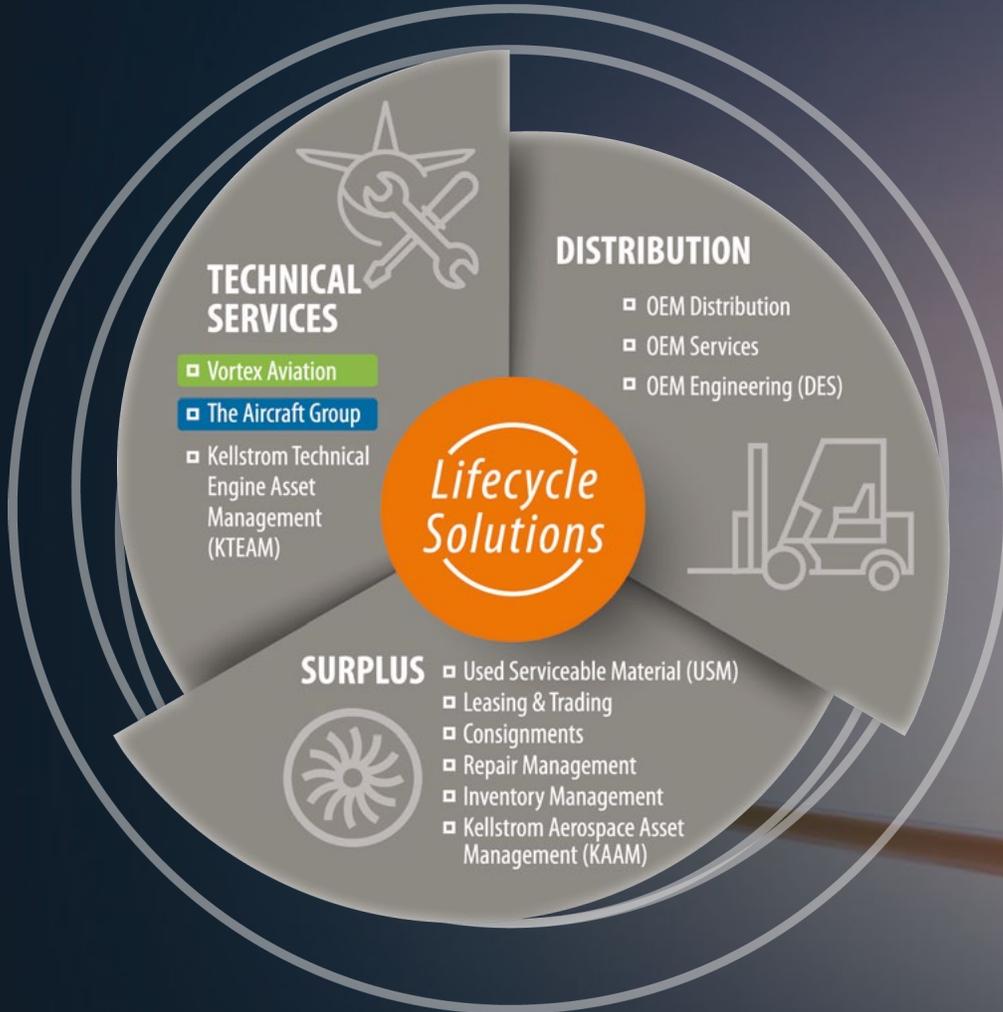
Scott Butler at Ascent Aviation sums it up as follows: “Managing the repair cycle is key to maximizing the value of the asset being torn down. Securing overhaul or time continuation inspection slots well in advance is critical to ensuring your product can be delivered to the end customer on time.”

### In summary

There is no question that any involvement in the aircraft teardown sector of the MRO market currently involves walking a tightrope between supply and demand. However, that balance which needs to be struck is not solely between the supply and demand for USM, but also the availability of aircraft for teardown to meet the current strong demand. There looms a potential Catch 22 situation where prices for UAM are keen owing to the shortfall of available aircraft. However, that availability is being affected because there is a shortage of new aircraft coming off the production line, meaning that older aircraft that might be suitable for teardown remain operational. That landscape may change once inroads have been made into the delivery backlog of new aircraft, thus with more aircraft available for teardown, their value will drop and subsequently so will the cost of USM. If USM costs fall, then there may be the temptation to hold on to rather than sell an ageing aircraft as maintenance costs will be reduced, thus creating a shortfall of suitable teardown opportunities. The result, a spike in the value of USM, and so the cycle could continue...

# AVIATION

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# Q & A

## In the hot seat...

Anthony Spaulding,  
President & CEO of  
Magellan Aviation Group



Anthony Spaulding, President & CEO of Magellan Aviation Group

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**Magellan Aviation Group provides a wide range of services. Can you tell us more about the different services you are offering to the industry?**

At Magellan, we take pride in offering a comprehensive range of services to the commercial aviation industry. Our core business revolves around the acquisition and sale of used serviceable materials (USM). These services involve planning the strategic disassembly of retired aircraft, facilitating repair management to ensure parts meet rigorous industry standards, and redistribution to global Airlines, Lessors, and MRO facilities. By providing our customers with top-quality, airworthy parts, we enable them to optimize

their fleets and reduce maintenance costs. With global stocking locations strategically placed in the USA, Europe, and Asia, we are well-positioned to support our worldwide customer base. And, with our 24-hour AOG service, airlines can swiftly access crucial material to minimize aircraft downtime and enhance operational performance.

Another pivotal aspect of our services involves engine leasing. Leasing green time from our engines enables us to provide airlines with a range of options to meet their specific needs, whether short- or long-term. By delivering flexible and tailored engine leasing arrangements, we help airlines improve their operations by providing the power to respond efficiently to

evolving demands.

Additionally, Magellan excelled during the times of COVID, helping asset owners who turned to Magellan to help dispose of challenged assets over time with our consignment management programs. With the industry rebounding and asset values recovering, consignments are not at the forefront of asset owners' minds but, Magellan will continue to offer innovative consignment solutions for whole assets or surplus inventories to the industry.

**Parts trading is a very competitive business in our industry. What do you think are the key factors to make Magellan a key player in the industry?**

## INDUSTRY INTERVIEW

Magellan has and continues to be a key partner to our industry, and this legacy is mostly attributed to the experience and expertise of our remarkable team. Their knowledge and commitment to quality guide our every action and form the bedrock of our success. Through the years, we've built a vast network with trusted partners, customers, and suppliers that span the globe. This network not only allows us to act early on product lines entering our market but lets us take a client-centered partnership approach, ensuring that we understand their unique needs and can offer tailored solutions that exceed expectations.

Adaptability is also a key factor that makes Magellan a leading organization in our industry. As a wholly owned subsidiary of Marubeni, Magellan is well positioned with the exceptional support of Marubeni to expand and grow our global reach to customers where Magellan can react fast to sudden shifts in the market.

### **Everybody is talking about digital transformation. Is this important for your business?**

Digital transformation holds immense significance for the industry, and it's an opportunity for continuous improvement we've been actively

“Digital transformation holds immense significance for the industry.”



Magellan Facility

navigating at Magellan. Within the aviation industry, we've witnessed substantial progress. However, it's important to acknowledge that there's still much work to be done, as hard copies of commercial trace are still needed to fill gaps in older assets as the industry moves away from paper to digital.

This challenge is not unique to Magellan but extends to the broader aviation community including lessors, lessees, and other participants in the aftermarket. We understand that the aviation industry's move toward digitalization must be a collective effort. It's not just about adopting digital tools but creating a culture of acceptance

and file integrity around digital records. This is a critical aspect, as digitized records offer numerous advantages, such as enhanced traceability, reduced paperwork, and faster information retrieval. These benefits are not only relevant to operational efficiency but also to safety and compliance, which is a key attribute of Magellan's quality and compliance programs.

### **What is your forecast for the near future in commercial aviation and the changes that you foresee?**

The future of commercial aviation is anything but certain. As recent global events have demonstrated, our industry is exceptionally dynamic, and adaptability remains a cornerstone of success. While nobody in our industry can predict every twist and turn, Magellan's ability to identify market fluctuations and make quick adjustments will continue to set us apart. Our primary focus is to remain responsive to emerging opportunities and challenges, ensuring we serve our customer's and partner's evolving needs in this ever-changing aviation landscape. By embracing change and harnessing the strengths that have brought us this far over the past 20+ years, we're confident that the next 20 years of opportunities or challenges will be met with persistence to achieve exceptional success.



Disc inspection



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A SATAIR SERVICE COMPANY



Kata Karba, trainee at Lufthansa Technik Budapest

## Women in aircraft maintenance

The Road less travelled - an overview of 'women' in aviation maintenance

By Swaati Ketkar

**W**hen I first heard this topic from my editor, a wave of relief washed over me. How difficult could it be to find women working in the aerospace maintenance, repair and overhaul (MRO) sector? A little research left me in shock as, according to Federal Aviation Administration statistics for 2021, only 2.6% of all aircraft maintenance technicians (AMTs) are women.

Armed with this figure I realised my search for women in aviation maintenance was not going to be easy, and thus began my hunt. I searched for women spread across various leadership roles in the MRO industry, right from a president, to a mid-level executive, to a trainee engineer. The perspective of these remarkable women revealed some interesting facts about the industry.

### Why is Women's representation in MRO sector negligible? Is the tide turning now?

A further probe revealed a slightly more optimistic fact. A recent survey by the International Civil Aviation Organisation by gender revealed that the percentage of female aircraft maintenance engineers and technicians rose from 2.7% to 3.0% worldwide, with an increase across all regions except the Middle East and Africa. Interestingly the highest increases in this area were again recorded in the Latin America/Caribbean and Asia Pacific (APAC) regions, with APAC crowned as having highest global percentage of licensed female aircraft maintenance engineers and technicians with 4.4%.

Although the worldwide figures

for women in MRO are increasing, the percentage is miniscule when compared to the demand. According to Oliver Wyman, the world will witness a shortfall of between 12,000 and 18,000 aviation maintenance workers with the imbalance between supply and demand likely to worsen over the next ten years, resulting in fewer flights, greater numbers of delays and cancellations, or airlines having to compensate by keeping more spare aircraft and parts on hand.

Wyman's survey also predicted that 2027 is projected to be the worst year for the shortage with a supply deficit of more than 48,000 aircraft maintenance workers, or a shortfall of about 27%.

Despite such mind-boggling numbers and the looming shortage, why are there so many fewer women in the MRO sector?



Kim Ashmun, President StandardAero

"It is important to get young women exposed to the aviation industry and the opportunities out there by generating interest early on in science, technology, engineering, and mathematics (STEM)," explains Kim Ashmun, president of the components and accessories division at Standard Aero. "My interest in science and engineering was piqued as early as high school which led me to pursue an undergraduate degree in engineering and, eventually, a job in the aviation industry. It is important to support and advocate for young women in STEM fields to not only help build their passion, but also their confidence early on," asserted Ashmun.

Ashmun's opinion was voiced by Elaine Chan Yee Lian, project manager at ST Engineering's airframe MRO facility in Guangzhou, China. Her experience over the years was that the ratio of women in the industry is increasing but there is no massive influx of female talent. On asking about the reason for this, Yee Lian said: "This is a tough industry even for men."

As doubts clouded my thoughts over this sentence, she happily continued that times are now changing. "It is becoming more common to find a woman working in the hangar or front line of aviation MRO, which is a sign of progress."

Speaking on the changing mentality and attitude of society towards the evolving role of women in aviation maintenance, lead engineer at FL Technics, Jolanta Gaske said: "Well, every year, the number of women increases! Attitudes among the public are also rapidly evolving. There is a far smaller difference in the jobs held by men and women." On a lighter note, she added: "An aircraft does not know if you are a man or a woman, how you do your job is of utmost importance. When performing plane inspections, there is no room for errors so I fall back on my training to find hidden flaws."

Gaske further stressed on having a deep passion for the job at hand: "It is not enough to complete your studies at university," she continued. "The study is

followed by a lot of training abroad and in-house. The work also requires physical endurance. Working in confined spaces like fuel tanks or on top of aircraft, you have to do everything correctly."

The more important point to note here is – If an aircraft does not differentiate between a man or a woman, why should we? Have we read articles on Men in Aviation Maintenance? Then why is the topic of Women in Aviation Maintenance not seen on the same page, instead of glamorising all that is needed is a change in attitude and equal opportunity for both genders. These are some hard questions we need to ask the stakeholders to address and solve to see more women entering and excelling in aviation MRO.

However, things are slowly changing. For example, at Iberia Maintenance there is a notable representation of women. "Apart from our chief technical officer, out of the eight members of the executive committee, four of them are



Jolanta Gaske, Lead NDT Engineer, FL Technics

**“ In the end all that matters is your love for aviation, not whether you are a woman or a man or what you studied in college. ”**

*Jolanta Gaske, FL Technics*

## AIRCRAFT MAINTENANCE

women,” said Teresa Montes Vicente, MRO Transformation Manager of the Technical Division at Iberia. The women at Iberia lead various departments like engine shop, heavy maintenance business, the transformation programme, safety & quality, and more.

Daiva Zemaite, Head of Engine Stands24 at Magnetic Group also feels that the industry is now on the verge of a significant change. “I encounter more and more women every year, if not monthly. This young generation is particularly ambitious and unafraid to challenge themselves and go after what they want. My take on the reasoning behind this is that the industry is highly technical in its nature, making the uneven gender division not an exception compared to other career paths.”

### **For a woman, is the career in aircraft maintenance by ‘choice or chance’?**

Most women are stuck while making a career choice in early years. And the poor representation of women in MRO stems from the fact that there is insufficient



Teresa Montes Vicente, MRO Transformation Manager, Technical Division Iberia

awareness about aviation maintenance to attract young women to this field. Some women stumble upon this career path by chance or fate while some have family member already in the industry who are prepared to back and encourage them. For Ashmun, the big career break came when she joined Lockheed Martin

as a manufacturing engineer after her bachelor of science degree in Engineering from Texas A&M University, and the rest is history. “I have spent over 20 years in the aviation industry, and I can’t think of a better career path,” claims Ashmun. “As I progressed, I realised that to advance on the technical path in my career I needed to not only have a depth of experience in engineering but, in parallel, to advance my education. I was always ready to take on the challenging assignments at work and, fortunately, was afforded great projects and opportunities to lead high-performing teams. Early on, I was focused on my technical career path and pursued a master’s degree while I was working full time. I ended up getting a master of science degree in Systems Engineering from Southern Methodist University (SMU). And, eventually, as I wanted to advance in the business and I pursued my MBA from SMU as well. A little over a year ago, I joined Standard Aero in my current role running the Components & Accessories division”.

For Davia Zemaite of Magnetic Group the offer to lead EngineStands 24 was by chance. However, her previous experience played a huge role. “For two decades, I worked in the car rental industry, so it being a means of transport as well, and together with leasing business experience,



Daiva Zemaite, Head of Engine Stands24, Magnetic Group



Elaine Chan Yee Lian, Project Manager ST Engineering

both served as a catalyst for my career in aviation. Aviation on its own has always had an appeal, where everything is precisely orchestrated, and it is an industry that is crucial to people," Zemaite adds. "That was the time when I had the chance to be a part of developing a rather new product in the market: engine stands. All of this was a gratifying and simultaneously challenging process, encompassing creativity, business development, market insights, and product knowledge".

Speaking about a distant childhood dream, Zemaite vividly remembers drawing a blue sky with an airplane and feeling it was a dream career. Back then she dreamt of being a pilot, and in a way, she found her calling in aviation.

For ST Engineering's Yee Lian, venturing into the field of aviation maintenance was well-thought off decision. "I wanted a career with good prospects and aviation MRO fit my requirements. I already knew that I would most likely join a 'male-dominated career line' given my degree in electrical and electronic engineering, but I am determined to follow my passion, stereotypes notwithstanding."

As a young girl, Yee Lian was inspired by the movie Amelia, depicting the story of aviation pioneer Amelia Earhart, the first female pilot to fly across the Atlantic.

For Kata Karba, a young trainee at Lufthansa Technik Budapest, her passion for aviation was kindled at the age of 12. Growing up in Canada with extended family in Budapest meant frequent air travel during early childhood. "First, I wanted to become a flight engineer, later I decided that I wanted to become a pilot," she says. "On a Toronto-Frankfurt flight we had a female captain on an Airbus A340-600 which left me spell-bound. A few years later I discovered my interest in fixing things and realised there is a job which is the mix of the two things I really enjoy: aviation and repairing. So here I am now. In my free time I enjoy being a glider pilot, and I work for Lufthansa Technik maintaining the big planes."

Societal perception of aviation mechanics as a male-dominated field could not sway Jolanta Gaske's determination to become an NDT engineer. "My academic pursuits

“ This is a tough industry even for men. ”

*Elaine Chan Yee Lian,  
ST Engineering*

exposed me to the world of non-destructive testing (NDT) and gender stereotypes never factored into my choice; rather, it was the sheer fascination with the subject that drove my commitment." Through her love for the subject, Gaske carved a niche for herself in the field. "I invested time and effort to realise my professional aspirations. While working alongside my male colleagues, I seamlessly integrated myself into the tasks at hand, where the focus was purely on collective contribution, devoid of any discussions about gender distinctions." She knowingly smiles as she remembers her work and contribution to the organization.

Teresa Vicente's journey to Iberia was fortuitous as she navigated the internship programme with SEPI (Sociedad Estatal de Participaciones Industriales). She considers herself lucky to have landed at Iberia. "I studied for a bachelor's degree in Business Administration, with no



Kata Karba trainee, Lufthansa Technik Budapest

engineering background, but I highlighted the importance of maintenance during the interviews, and as a result, I was assigned to the Line Maintenance Division. I was highly motivated from the beginning, as this represented a significant opportunity for me. And I'm proud to say, I was right. It was and it is a great opportunity for me. I have worked at Iberia for 11 years and have been lucky enough to have worked in different areas of MRO as Line Maintenance, Base Maintenance or Commercial and, now in the Transformation team." For Vicente, every day includes a novel learning experience.

### The challenges, then and now...

For most beginners the initial challenge is understanding how the industry operates in general, followed by familiarising themselves with the different technical aspects of an aircraft. Quick learning and easily blending in/ adapting to the work environment works wonders. However, if you need to climb the success ladder right to the top, education is more relevant than anything advises Engine Stands24's Zemaite. "Since I wanted to dive deeper into aviation and acquire all this information quicker, I also obtained a degree in Aviation Finance and Lease at the University of Limerick."

At present, there are growth and expansion challenges as every market has its own nuances, cultural differences, and distinct business environments. "From a border perspective, adjusting to the post-COVID industry has taken some time, getting back on track after this bumpy ride and defining the new normal for the engine stands business," adds Zemaite. "Coping-wise, Covid has helped to strengthen stamina and agility; now, you always have a plan B. From the start, we've always had this innovation-forward approach by introducing a digital solution in a relatively conservative industry and easing the client's journey. On a personal level, nature, dancing, and sports help me with daily challenges."

A challenge could be as small as familiarising oneself with numerous



Kim Ashmun, President StandardAero

technical terms and acronyms used within the industry as was the case for Iberia's Vicente. "Currently, my challenges primarily involve the development of leadership skills. During my three-year period of leading the Iberia Maintenance Network, I was subject to daily pressures that involved 24/7 requirements and AOGs that impacted on the passenger experience. Since then, I have learned to put these pressures in perspective, and therefore, I no longer feel stressed," she adds.

"Throughout my career, I have been thought carefully about the roles and opportunities I have taken on making sure not to advance too quickly without the right depth and breadth of experience for the next role. This can sometimes be challenging early on in someone's career when you want to move up quickly but don't have the right experience to enable you to be successful in that next role," says Standard Aero's Kim Ashmun after drawing a couple of decades of experience in aviation MRO. "Taking the time to be thoughtful in key decisions around what role and timing to further my career best prepared me for the role I have today," she advises.

For most women, the work-personal life balance is the biggest challenge. Ashmun's advice to tackle this challenge

is to understand what you want and work towards that goal. "When I am asked for advice from early-career professionals, career planning is at the top on my list. It is so important to help provide direction and help someone navigate through their career. Most importantly, be in a position to make informed decisions about what's next and how that next step can help you achieve your professional and personal goals!" she informs.

"Luckily for me, FL Technics provided the opportunity to get all the necessary training abroad to become an NDT engineer," adds Gaske, Lead NDT engineer. "As for daily challenges, I can feel confident that all inspections will be carried out professionally and quickly. Working together with other departments around the world helps us solve problems together, which reduces stress."

The day-to-day challenges can be very different from someone at a leadership role as compared to a trainee engineer. For Lufthansa Technik's Kata Karba being the only girl in the class had its own challenges and insecurities. "I felt like the bar was set high as I had to prove that I am able to perform in a typically male-dominated field. Swiftly I became part of the class and I was able to share the



Elaine Chan Yee Lian, Project Manager ST Engineering

excitement and passion during each day as we learned something new or prepared for exams." Karba gradually overcame the challenge, gelled in with the team overcoming the daily on-job pressures. "Now I don't feel any differences regarding gender. I am very confident in my abilities and I can carry out work without any fear of rejection from other colleagues."

People in the field tend to perceive women in the industry from two extremes, either feeble and delicate or masculine/boyish. "When I first joined the industry, I had to strike a balance so that male colleagues or batch mates would treat me no differently just because of my gender. While working in the hangar as a trainee engineer, I often spoke up and requested to take on more work as I learn best through hands-on experience," says Yee Lian of ST Engineering.

One of the best ways to deal with day-to-day pressures as explained aptly by Lian is envisioning the worse-case scenario and coming up with different plans and options. This will avoid panic attacks and ensure you make an informed decision with a cool head.

### **Golden words of wisdom, - why one should join or pursue AME as a career-option?**

While reading this heading, 'Women in aviation maintenance', at a first glance this topic seems pretty simple and

straightforward. However, deep diving into the lives of women in aircraft maintenance is an eye-opener for everyone. "Each day, as I step into the hangar, I am filled with a profound sense of joy, knowing that I am privileged to engage in a job I am genuinely passionate about. The beautiful sights and smells of the aircraft and hangers brings me immense satisfaction," says FL Technic's Jolanta Gaske. Driven by a strong sense of purpose, Gaske adds: "I hold a significant responsibility, as my daily efforts directly contribute to ensuring the safety of flights. Through NDT inspections, we discover imperfections that escape the naked eye. The timely detection and rectification of these defects is vital in ensuring the safety and reliability of air travel as one of the safest modes of transportation allowing us to enjoy secure and uneventful journeys through the skies," she signs off.

"Go for it! There are countless opportunities in aviation," advises Ashmun. "In my experience, building that technical depth of knowledge was important to me, but I also enjoyed the business side of things. Ultimately, that is what guided a lot of my decisions throughout my career. I really spent the time to understand what energized me at the end of the day and it was solving complex business problems with the team and seeing the results." Speaking on the final mantra to follow your calling, Ashmun adds: "Always give your best, be fully committed to what

you decide you want to do and lead with integrity. I had times that were challenging and didn't always go to plan but, looking back, those were some of my greatest learning experiences and helped shape the leader I am today."

All-in-all, women can make up for physical strength with greater resilience and attention to detail, and applying their strengths to overcome their weaknesses can turn them into advantages.

Advising and encouraging young girls to take up aviation maintenance as a career-option, Kata Karba adds, "After one year of classroom learning and training shops, I will finally lay hands on a real aircraft, which is a dream come true. Nothing can compare to this achievement."

In the end all that matters is your love for aviation, not whether you are a woman or a man or what you studied in college. All it takes to succeed in pursuing a career in aviation maintenance is a strong desire and effort, Gaske signs off.

The struggles, the challenges, the ambitions and the inspirations of such women who dared to break the glass ceiling and venture into the male-dominated industry of aerospace maintenance, repair and overhaul is not just remarkable but an eye-opener in itself.

Magnetic Group's Davia Zemaite sums it up beautifully by saying "Go, girl, go!" Simple, yet it implies that you should pursue your passion, regardless of the industry and your chosen career. There are a lot of supportive women in aviation, rooting for each other. Lastly, neither gender, age, nor religion should bind you or stop you from pursuing your dream career."

These women and many more like them are the unsung heroes of aviation and aerospace, who dared to soil their hands and clothes with grease and oil, toiling for long hours under the stuffy atmosphere of a hangar but coming out with the ultimate reward of signing the airworthiness document of an airplane, signalling that the aircraft is now all set for take-off towards a safe journey ahead. Massive respect and big salute to them!



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## »»»»→ *on the move*



Steven Townend

BOC Aviation has appointed **Steven Townend** as Managing Director and Chief Executive Officer with effect from January 1, 2024. He will replace **Robert Martin** who will step down from the role on December 31, 2023, and will remain as a non-executive Director of the Board. Furthermore, **Wu Jianguang** will be appointed Chief Financial Officer with effect from January 1, 2024, replacing Townend in the role of Chief Financial Officer which he

will relinquish on December 31, 2023. Townend has more than thirty years of leasing and banking experience in aviation. Prior to his appointment as Chief Financial Officer in October 2020, he had previously held Chief Commercial Officer roles with BOC Aviation in both London and Singapore for over 16 years. Wu has been in the role of Deputy Chief Financial Officer since November 2022. At that time, he transitioned from the Bank of China after a 30-year career, where he was most recently General Manager of the financial management department. Wu will oversee Accounting and Reporting, Financial Planning, Financial Control, Tax, Treasury and Settlement Departments.



Chad Archer

Following a long-standing career spanning almost twenty years with the company, Textron Aviation welcomes **Chad Archer** to Senior Vice President and Chief Financial Officer (CFO) effective January 1, 2024. Archer most recently served as Vice President, Financial Planning and Analysis and Strategy. During his tenure with Textron Aviation, he has held various leadership positions within business management,

financial planning and analysis. He has demonstrated consistent leadership in mergers and acquisitions, including the recent

successful integration of AeroMotion last year and has achieved significant revenue growth goals within the Asia-Pacific region. In his new role, Archer will oversee all financial matters for Textron Aviation Inc., including financial planning and analysis, strategy and integration and economics. He succeeds **Dave Rosenberg** who has been promoted to Vice President, Investor Relations at Textron.



James Larnar

Nasmyth has announced the appointment of **James Larnar** as its new Chief Financial Officer (CFO). In his new position Larnar will be responsible for the group's financial and IT decision-making and support the Board with strategy formation and execution. He was most recently CFO for DeterTech Group, an intelligence-led security solutions business and managed the process of private equity investment as well as strategic M&A

and refinancing. Prior to that he was CFO of AIM-listed Autins Group leading on the IPO process taking the Group from private to public ownership and securing growth investment. Both roles were wide ranging with direct responsibility for the financial, legal, IT, HR and supply chain functions together with direct daily involvement in the sales and operational improvements and management. Larnar is a chartered accountant having trained at Ernst & Young Birmingham, UK, and has also held senior positions at Caparo Mill Products, Tata Steel Distribution and Eliza Tinsley Group PLC with experience in leading business turnarounds and improvement processes. Established in December 2003, Nasmyth brings together in a single effective team the collective expertise, resources and technology of the customer-orientated, precision engineering businesses. These provide the basis for four global capabilities machining of hard and soft metals, systems and defence manufacturing and assembly, fabrication and welding and metal treatments. Nasmyth currently employs over 450 highly experienced and specialist industry professionals.



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