

MRO

Aerospace Magazine

**Opportunity
knocks for
teardown
acquisitions**



Auxiliary Power Units

Airlines fire up APUs as industry sees solid recovery

Spare Parts Supply

Will Russian-made parts maintain airworthiness?

Industry Interview

Fraser Currie,
Chief Executive, Joramco

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MROs see growing opportunities in Africa

Over the last decade many African airlines have implemented fleet strategies to move away from being a dumping ground for ageing aircraft and we have seen some airlines completely transforming their fleets with the acquisition of new technology aircraft but these will also present new MRO challenges for airlines.

Following the recently concluded MRO Africa 2022 event in Johannesburg, South Africa, there was strong emphasis on the future growth of the African air transport market and it was identified that new aircraft were opportunities for African carriers and MROs to cooperate and the growing demand was an enabler for MROs to develop their business.

At the event in Johannesburg, the African Airlines Association (AFRAA) spoke about critical initiatives including the Brown Condor Initiative which aims to help AFRAA members to generate revenue by selling African MRO capabilities and excess inventories of spare parts in the US Market. The project targets four MROs; Ethiopian Airlines, Kenya Airways, SAA Technical, and EgyptAir. Ethiopian Airlines and Egyptair have already signed the agreement.

Interestingly, as we went to press, Joramco announced it had entered into an agreement to support the establishment of Aerojet Aviation Training Academy to provide advanced studies in aircraft maintenance in Ghana and the sub region. The four-year aircraft maintenance course is divided into both theoretical and practical training, with the aim of graduating the first batch of future aircraft maintenance engineers with the experience and confidence to immediately join the workforce at the Aerojet MRO facility being established in Ghana.

We will be keeping a close eye on the opportunities and the development of MRO partnerships in Africa.

Keith Mwanalushi
EDITOR

Ethiopian has signed up to AFRAA's Brown Condor Initiative.

Photo: Airbus



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Ascent Aviation Services

Publisher

Peter Jorssen
p.jorssen@avitrader.com

Editor

Keith Mwanalushi
keith@aeropublications.co.uk

VP Sales & Business Development (Advertising)

Tamar Jorssen
tamar.jorssen@avitrader.com
Phone: +1 (778) 213 8543

Graphic Designer

Volker Dannenmann,
volker.dannenmann@gmail.com

Sales & Marketing Manager

Malte Tamm
malte.tamm@avitrader.com

Managing Editor

Heike Tamm
heike.tamm@avitrader.com

Published monthly by

AviTrader Publications Corp.
Suite 305, South Tower
5811 Cooney Road
Richmond, British Columbia
V6X 3M1
Canada
Tel: +1 (424) 644-6996
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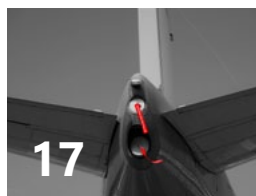
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ST Engineering and Safran Aircraft Engines sign agreement for aircraft engine maintenance offload

ST Engineering has released that its Commercial Aerospace business has signed a five-year agreement with Safran Aircraft Engines for ST Engineering to provide engine maintenance (shop visit) offload for the CFM56-5B and -7B engines. This multi-year agreement will allow ST Engineering and Safran Aircraft Engines to meet the forecast rise of engine MRO activities as air travel gradually recovers from the pandemic. Tay Eng Guan, VP/GM of Engine Services at ST Engineering, said, "As a licensed service centre for CFM56-5B and -7B engines, ST Engineering has built a longstanding and strong relationship with Safran. We are delighted to build on that partnership with this latest engine offload agreement. With flying activities picking up strongly, we look forward to leveraging our engine MRO expertise and facilities in Asia to support CFM customers and the recovery in global air travel."



Photo: Contract signing between ST Engineering and Safran Aircraft Engines

Astronics to provide Southwest Airlines with latest-generation of In-Seat Power



Photo: Southwest Airlines Boeing 737 MAX-8

Astronics Corporation has signed an agreement with Southwest Airlines to provide its EMPOWER® Passenger In-Seat Power System for installation on 475 Boeing 737 MAX-7 and MAX-8 aircraft. This award is part of Southwest's recently announced significant cabin upgrade initiative to enhance the customer experience. The system configuration selected by Southwest Airlines will provide 60W Type-C and 10.5W Type-A USB charging ports at every passenger seat. This will allow passengers to power and charge two devices simultaneously, including smartphones, tablets, laptops and other portable electronic devices (PEDs). Astronics will begin delivering in the fourth quarter of 2022 for retrofit installations on Southwest Airlines' existing MAX-8 fleet. The Astronics Connectivity Systems and Certification group has been selected to provide the installation design, STC certification and installation kits for the retrofit. Deliveries to Boeing for installation on new aircraft on the production line will begin in 2023.

Lufthansa Technik and Premium AEROTEC reach milestone in additive manufacturing

In their joint effort to use additive manufacturing methods for a more cost-efficient aircraft spare parts production, Lufthansa Technik and Premium AEROTEC have reached an important milestone: a metal component developed at Lufthansa Technik's Additive Manufacturing (AM) centre for the IAE-V2500 engine's anti-icing system has now received its official aviation certification from EASA. On this basis, Premium AEROTEC will produce the so-called "A-Link" for Lufthansa Technik at its Varel (Germany) site using a 3-D printer. As part of this certification process, Lufthansa Technik has now extended the expertise of its EASA Part 21/J development facility to include additively manufactured metal components. For Premium AEROTEC, the cooperation with Lufthansa Technik is a significant milestone in the field of additive manufacturing, as it is the first time the company has supplied a customer outside the Airbus Group with printed series components. The first A-Links from the cooperation will be used in the Lufthansa fleet, where long-term experience with the new components is to be gained beyond certification.

Rolls-Royce selects Liebherr-Aerospace to supply Pearl 10X engine valves

Rolls-Royce has announced that Liebherr-Aerospace (Liebherr-Aerospace) will provide a pneumatic four-valve package for the Pearl® 10X engine which will power the Dassault Aviation Falcon 10X business jet. The agreement between Rolls-Royce and Liebherr-Aerospace further strengthens the presence of the latter in the engine market. The Dassault Pearl 10X is the most powerful of the Pearl series of engines and the Dassault Falcon 10X is anticipated to enter into service in 2025. Liebherr-Aerospace is also involved with the provision of an integrated air management system, landing gear actuation and steering components for the Falcon 10X. "This contract enabling us to be part of Rolls-Royce's Pearl 10X

engine is a testament that deep collaboration and excellence pays off. We are very proud to work so closely with our customers in developing state of the art technology to fit their specific needs", said Alex Vlieland, Chief Customer Officer, Liebherr-Aerospace. Liebherr-Aerospace, a subsidiary of the Liebherr Group of companies which began operations over sixty years ago, is a leading supplier of systems for the aviation industry. The range of aviation equipment produced by Liebherr-Aerospace for the civil and defence sectors includes flight control and actuation systems, gears and gearboxes, landing gear and air management systems as well as electronics. These systems are deployed in wide-bodied aircraft, single aisle and regional aircraft, business jets, defence aircraft, defence transporters, defence training aircraft and civil and defence helicopters.



The Falcon 10X is powered by two Rolls-Royce Pearl 10X engines with Liebherr components
Photo: Dassault Aviation

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HAECO Cabin Solutions and Diehl Aviation unveil joint products development for single-aisle cabin upgrades

HAECO Cabin Solutions in cooperation with Diehl Aviation have announced three cabin upgrades designed to reduce weight, increase capacity and improve passenger comfort. The first product, the "Aft-Simplex," is a simplified single-aisle aft-lavatory/galley complex. For many single-aisle operators it provides improved density by allowing the addition of up to six seats and lowers operating costs and/or provides increased range through reduced weight. The Aft-Simplex is at least 70 kg (155 lbs.) lighter than comparable solutions from other suppliers. Four standard configurations are available. When installed in combination with HAECO's Vector Light seats, overall aircraft weight is reduced by up to 800 kg, an unprecedented improvement in operating economics for single-aisle aircraft. The second product is a combination of HAECO's Eclipse seat, and a unique floor-to-floor solution designed by Diehl. The exceptional design features of the Eclipse seat allow it to be installed in a five-abreast configuration without compromising passenger comfort or privacy. The third product is an enlarged 737 overhead bin solution. The design of this bin allows it to be installed without modifying the aircraft structure or PSU interfaces at a weight lower than current products.

Engine Lease Finance

Corporation has announced that it is rebranding as elfc with a completely new look, including its logo, corporate colours and website. The company logo and brand identity has undergone a significant transformation and while this is a major change, its core values and commitment to all its stakeholders remains absolutely the same. Its values and integrity are the foundation of everything they do at elfc. Since its foundation in 1989 elfc has undergone continuous growth and development and the company is a trusted partner in the aircraft engine leasing industry, continuing this evolution and growth with its new brand identity.

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SCHROTH Safety Products launches revolutionary lap belt airbag for commercial aviation

SCHROTH Safety Products, a leading manufacturer of innovative occupant protection and restraint systems for customised applications in aerospace, defence and motorsport, is introducing its new and advanced Passenger Lap Belt Airbag at the 2022 Aircraft Interiors Expo® held in Hamburg, Germany. The all new SCHROTH Lap Belt Airbag System is the signature product for commercial aviation passenger restraint solutions. Building on SCHROTH's extensive experience with inflatable passenger safety products in commercial and business aviation, the SCHROTH Lap Belt Airbag System delivers the next generation of passenger airbag solutions. The system's ground-breaking, patent-pending design is suitable for passenger seating applications in all commercial passenger classes. It is the ideal occupant safety solution for critical front row, exit row, and business class seats. The design meets the latest FAA and EASA rules on head impact, neck injury, head rotation, rebound and chest acceleration, while it has been optimised for passenger comfort with a soft and comfortable packaging. A key feature of the new product is its unique airbag shape which covers a wide spectrum of seating configurations, thus avoiding recurring design and test iterations, and substantially reducing engineering and certification costs.



Photo: SCHROTH Lap Belt Airbag System

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Jetglow and Aerospace Engineering Solutions to manufacture scratch panes for Boeing 737

Offering a wealth of experience repairing and refurbishing commercial aircraft interiors has led Jetglow Aircraft Refurbishments to identify several high-volume replacement parts and make significant savings on OEM costs to airline operators. Alongside its carefully chosen Part 21J design partner – Aerospace Engineering Solutions – both companies have developed, from concept to delivery, Boeing 737 aftermarket scratch panes for cabin sidewall panels available for release on a Form 1 under Jetglow's Part 21G approval. By bringing manufacturing capabilities to the UK, both companies can build on opportunities for the local market as well as saving airlines significant costs. The product – a protective screen used to prohibit airline passengers from touching the pressurised window, not only adds a layer of protection against contaminants but prevents passengers from touching sensitive areas of the aircraft.



Scratch pane in situ on aircraft window panel

Photo: Jetglow

Philippine Airlines and AFI KLM E&M extend support contract for 777 and A320 engines



AFI KLM E&M met with PAL's new management in Manila at the end of May to celebrate the continuity of a longstanding cooperation

Photo: AFI KLM E&M

Philippine Airlines (PAL) has signed an extension to its flight-hour support contract with Air France Industries KLM Engineering & Maintenance for the GE90 engines powering its Boeing 777 fleet, as well for the CFM56-5B engines fitted on its Airbus A320 aircraft. Following a successful restructuring process in 2021, the Philippine flag

carrier has established a new fleet plan. AFI KLM E&M will support PAL with GE90 shop visits for as long as the 777 serves on the airline's fleet. Cooperation is also extended on the CFM56-5B engines for PAL's A320s serving domestic and regional routes. "We value the partnership we have with the AFI KLM E&M teams, who have been

a loyal ally throughout the uncertainty of the last two years. PAL and AFI KLM E&M have kept strong communication lines during the pandemic, and we look forward to continuing our robust ties as they continue to support our fleet requirements in the future through this extended agreement."

C&L Aviation Group completes construction of state-of-the-art aircraft interior refurbishment facility

C&L Aviation Group has completed the construction of a state-of-the-art 12,000-ft² aircraft refurbishment facility at its Bangor, ME campus, next to the company's aircraft paint hangar. The facility will be utilised to address the increased volume in both regional and corporate aircraft interior refurbishment projects the company has been receiving for the past several years. "We've made substantial investments in space, equipment and manpower for the aircraft operators we serve," said Chris Kilgour, CEO of C&L Aviation Group. "The new facility, along with increased in-house capabilities, provide us with robust options for customers looking for anything from a basic replacement of soft goods to complete interior upgrades and modifications." The new facility is

equipped with a Gerber leather cutting machine, laser engraving machine, paint booth, seatbelt manufacturing centre, separate assembly and disassembly areas and more. The new facility is one of five building projects C&L has completed since the start of the pandemic. In 2020 the company purchased a local events centre near the Bangor airport and converted it into a component shop, where they work on smaller aircraft components. The company also constructed a new 27,000-ft² aircraft parts warehouse, a 5,000-ft² add-on to one of their hangars for storage, and a complete renovation of its corporate aircraft maintenance hangar which includes new floors, walls, customer offices and a state-of-the-art interior showcase and design centre.



Photo: Collins Aerospace is advancing digital aviation solutions that will make flights more efficient and sustainable with FlightHub

Collins Aerospace is advancing digital aviation solutions that will make flights more efficient and sustainable with FlightHub, its new Electronic Flight Folder accessible from an aircraft's Electronic Flight Bag (EFB). FlightHub centralises data sources and workflows for pilots and airlines, coordinating the lifecycle of an entire flight from start to finish. Collating information into a single stream, FlightHub gives customers fast and easy access to all their flight information, from pre-flight documents, like flight plans and weather information, to post-flight summaries with actual timing and fuel burn reports. FlightHub customers will also get access to Collins' new Flight Profile Optimisation (FPO) solution that delivers real-time route recommendations throughout a flight to help reduce CO₂ emissions by saving fuel and time. Set for release later this year, FPO provides flight path information taken from multiple aircraft and ground sources for more up-to-date information than what is generally obtained from the operational flight plan (OFP) and the flight management system (FMS), which can be several hours old. In aggregate, airlines using FPO could see up to 1% annual savings on fuel per year.

Concerns raised over Russian made **parts** on foreign aircraft



There are around 500 aircraft leased to Russian operators.
Photo: Airbus

Strong reactions have followed reported plans by Russia to produce its own parts supply amid sanctions, questioning the potential airworthiness of modified aircraft by global regulators, as **AviTrader MRO** observers.

Reports from Russian media have suggested that the Russian Federal Air Transport Agency, or Rosaviatsiya has issued certificates to five Russian companies to develop parts for foreign aircraft. Since the invasion of Ukraine, the international sanctions on Russia have cut off local airlines from supplies of aircraft spares and support services from the supply chain.

Whilst there are some well-established MRO's operating in Russia, the main challenge for Russian airlines in maintaining aircraft will be the supply of spare parts. As an April 2022 report by aviation consultancy firm *IBA* indicates, the majority of spare parts required to maintain aircraft and engines are built by companies outside Russia, who are now unable to send those parts to the country following sanctions. Even the Russian built Sukhoi

Superjet contains avionics, navigation equipment and cockpit instrumentation made by Honeywell, which is an American company.



Harry Boneham, Aerospace Analyst at GlobalData

"It should be considered that there are multiple factors that influence the period of time before sanctions could impact the spares supply to Russian airlines," *IBA* stated in its report, saying these include stock levels at Russian airlines and MROs, possible underground activity, and the potential for parts to be copied and manufactured locally.

According to Russian newspaper *Vedomosti*, the five organisations that have received certificates are the State Civil Aviation Research Institute, S7 Technics, the Ural Civil Aviation Plant, Aviation Engineering Solutions and the Navigator Institute of Aeronautical Instrumentation.

Data and analytics company, *GlobalData* has weighed in on the issue saying Russian parts on foreign aircraft could complicate future international travel following war

in Ukraine. Rosaviatsiya's certificates could carry consequences for travel between Russia and the West in the medium term. Foreign aircraft represent a significant proportion of the Russian commercial fixed-wing aircraft fleet—with Airbus and Boeing making up 73.3% in 2021, while the Russian United Aircraft Company accounted for the remaining 26.7%, according to a report by GlobalData.

"However, Russia has been unable to secure spare parts for these aircraft due to the sanctions that have been imposed on the country and has been driven to develop its own," commented Harry Boneham, Aerospace Analyst at GlobalData.

Boneham said the installation of Russian improvised parts would likely compromise the airworthiness of modified aircraft in the eyes of Western regulators. "Furthermore, Western parts manufacturers may take legal action against their Russian counterparts due to copyright infringement, which could delay or deter regulators from certifying Russian-made parts. As a result, Russia's extensive Western-made fleet is unlikely to be certified in Europe and the US in the medium-term. Even if the war abates and the sanctions are removed, Russians will be kept in a form of de facto isolation due to a lack of certified aircraft," he said.

“Western parts manufacturers may take legal action against their Russian counterparts due to copyright infringement, which could delay or deter regulators from certifying Russian-made parts.”

Harry Boneham, GlobalData

IBA has observed that airlines who have been unable to source or pay for spare parts will cannibalise aircraft to enable the continued operation of a smaller fleet. IBA expects this trend to play out with Russian airlines as sanctions continue to bite. The majority of aircraft parts are maintained



The supply of spare parts is a challenge for Russian carriers.

Photo: Azur Air

on a 'on condition' basis. This means that following a failure, a part must be replaced within a timeframe set by the manufacturer. The timeframe is influenced by how safety critical the part is. Some exceptions can be made based on the aircraft minimum equipment list (MEL), which can allow operations to continue for a limited time with certain parts or systems unserviceable.

Just as recently as November 2021, Russian MRO provider S7 technics announced it had launched a new facility for Embraer aircraft heat and sound insulation repairs, a service within its cabin interior repair shop.

The S7 shop specialised in maintenance and repairs of thermal acoustic insulation mats and was reportedly the first of its kind in Russia. S7 Technics had pinned its hopes that Russian operators of Embraer's and wider CIS would have the option to repair these components locally, instead of going through more costly and time-consuming procedure of having to order and import new components from foreign providers.

Following the sanctions on Russia, Embraer like other major OEMs, suspended maintenance services and the sale of parts to Russian operators. Data from *ch-aviation* shows that S7 Airlines has 17 E170 jets on its books.

With the sanctions in place on Russia, it is likely the lack of access to spares is already having an impact on aircraft and engines at different stages of their maintenance cycle.

Additionally, Boneham from GlobalData indicated that the prospect of international lessors recovering the approximately 500 aircraft leased to Russian operators is now even more remote. Sanctions ordered many lessors to terminate their agreements with Russian carriers and halted any attempts to recover their aircraft from Russia – "Despite this, hundreds of foreign-owned aircraft have been flying Russian domestic routes, after a law change allowed operators to re-register an aircraft in Russia without first obtaining proof of deregistration from the previous registry. This is a move that has irrevocably damaged the relationship between lessors and Russian operators. Now, it seems that foreign-owned, Russian-held aircraft will be modified, rendering them uncertifiable in the West."

Boneham added that with domestic producers handicapped by sanctions and a radioactive reputation with international lessors, it would be unclear where Russian operators might turn to quickly procure commercial fixed-wing aircraft, which are licensed to fly globally. Previously untapped producers in China or the Brazilian firm Embraer are possible options, but deliveries will not be immediate and even these incorporate Western parts in their designs.

IBA has identified that there have been no Aeroflot A350 operations since early March 2022. IBA believes it is highly likely this is as a result of software expiring or being withdrawn on the aircraft.



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Responding to complex machining challenges

INDUSTRY OPINION



Halcyon machinists - nimbleness and adaptability are needed to be able to scale production up quickly.
Photo: Halcyon Manufacturing

Tony Doan, Chief Executive at Halcyon Manufacturing says the ability to pivot operations to quickly respond to design changes and scale-up production is key to success for the aerospace industry.

Within the dynamic aerospace and defence sectors, changes to part specifications and quantities are frequent and often unpredictable. It is necessary for the market to quickly adapt to design and production changes as they occur and be capable to scale up to 'lights out' manufacturing when needed.

"Aerospace and defence customers may prefer large machining operations," said Tony Doan, CEO of Halcyon Manufacturing, an advanced ITAR registered and AS-9100/IS-9001-certified machining shop based in San Jose, California. "But size alone does not equate to capacity. Smaller shops can have an advantage when a client needs a machining partner to also be nimble and flexible. For our clients, the ability to adapt and problem solve is incredibly important as complex manufacturing requirements

frequently evolve and change."

"Aerospace machining involves a lot of low volume, high mix work," adds Doan. "The reality is not every machine shop wants to take on small orders or overly complex jobs. A client needs a machining partner who really embraces this kind of work in addition to the high-volume orders."

When evaluating the capacity of a precision machine shop, the capability to respond to changes in specifications and production quickly becomes a key factor. Nowhere is this more acute than when an aircraft operator has a priority aircraft on the ground (AOG) machining order. Until the AOG gets filled, an aircraft will not be able to operate making response time incredibly important. Unfortunately, an AOG order is never predictable and can happen at any time.

Building capacity through cross-training

Staff cross-training is one way a machine shop can improve their ability to respond to unexpected and time-sensitive machining needs such as AOGs. While today's machine shops are filled with a mix of high-tech precision CNC equipment, each requires trained staff to manage, maintain, and operate.

"A lot of aerospace machine shops will assign an operator to a specific CNC machine," said Doan. "This can create a situation where a particular operator has to be available and not working on other orders, to operate a given machine."

Having the ability to move people from machine to machine, as well as from line to line and from shift to shift, without interruption enables a machine shop to respond to changes in demand more quickly.



Until the AOG gets filled, an aircraft will not be able to operate.
Photo: Finnair

At Halcyon, where they machine bar grade 6061 aluminium, brass, copper, titanium, stainless steel, and plastics, they have cross-trained their entire staff to work across all their equipment to maximise their capability for scale up.

"We have not only cross-trained our team, but we all work multiple shifts, and we have the same controls throughout our shop," said Doan. "It makes it easy for our people to be able to move around as needed. So, when a client needs something over a weekend, we do not have to completely rethink how we are going to schedule. We can easily plug in people for surge hours or to increase our workforce as needed."

The company made the decision to further enhance their cross-training through their selection of machining equipment. Unlike shops that purchase a variety of types and brands of CNC equipment over time, Halcyon intentionally purchases the same model of high-end five-axis CNC machine from Doosan Machine Tools with FANUC controls as they expand. This further reduces the learning curve for their staff.

Lights out manufacturing capability

Nimbleness and adaptability are also needed to be able to scale production up quickly. Some machine shops such as Halcyon operate on an around the clock

"You also need a machining partner to be proactive. By engaging early in the process, an aerospace machine shop can anticipate and resolve machining issues before any parts are produced."

In a recent example, Halcyon had a client bring them what appeared to be a simple part but could not find a machine shop that wanted to take the job. The part had a six-inch threaded shaft with a hex head. There was an 832 thread across the outside diameter (OD) of the shaft.

"Most lathes aren't able to cut those



Halcyon doosan lynx 2100lsy workstation.

basis enabling customers to connect with them outside of traditional office hours.

"'Lights out' manufacturing takes scaling up production to the next level," said Doan. "CNC operators can set up the equipment to run on its own without supervision overnight. This 'lights out' capability means smaller shops can maximise their capacity without adding more staff."

It starts with culture

The mindset that a machining partner brings to precision aerospace machining is also critically important.

"It starts with the culture of the shop and the problem-solving mindset they bring to a project – particularly for complex, precision parts," explained Doan.

threads across six inches," said Doan. "We had to get creative since we could not use round stock, which is generally used when cutting OD threads."

The team determined how to form the threads while accounting for the "growth" that occurs when threads are formed on plate steel to meet the tight requirements. For it to run on a CNC machine, they also had to create a modified thread using a cut die to create a formed thread.

"We took the challenge on and were able to meet the client's deadlines with parts that met spec when no one else could do it," Doan continued. "It takes more than the equipment and know-how; it also means really having an appetite to take on these kinds of complex challenges."

REGIONAL FORECAST: FLYING HIGH

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There is increasing activity in APU work following storage.
Photo: EPCOR

Operators focus on cost and customised programmes for APU maintenance

As air travel picks up, airlines are firing up their APUs following a considerable time in storage and the industry is reporting greater MRO activity as operators catch up with maintenance. **Keith Mwanalushi** reports.

The COVID pandemic led to masses of aircraft fleets in storage but as airline operations ramp up there is increasing activity in Auxiliary Power Unit (APU) work. In April, for instance, Safran signed a maintenance agreement with AJW Group for a period of five years to support around 50 APUs and more than 100 ventilation systems per year.

Indeed, the impact of the pandemic resulted in financial pressures for many operators. Coty Stiltner, Manager - APU Bid Development, Airlines and Fleets at StandardAero observes that this has led to increased interest in the use of green time (i.e. part life) engines, a heightened focus on maximising 'time on wing' for APUs, and an even greater emphasis on cost savings, for instance through the

use of component repairs in lieu of new parts. He says while turn-around times and delivered quality remain key criteria for operators when it comes to choosing an APU maintenance programme, cost is more important than ever.

"Thankfully, the industry is now seeing a solid recovery across multiple market segments and regions, and this is leading to greater MRO activity as operators catch up with maintenance that had been deferred during the height of the pandemic," says Stiltner.

Considering that operators have adjusted to 'new norms' and have mapped out their post-COVID strategies, StandardAero has observed an increase in interest from operators wishing to switch the type of maintenance programmes

that their APUs are enrolled on, for example moving from power-by-the-hour programmes (which mandate payments even if the customer's fleet is not flying) to time and material (T&M) contracts. "Another trend that we have noticed is customer interest in switching from existing APU maintenance programme providers to new MRO partners who are more focused on creating customised programmes tailored to the operator's specific APU maintenance needs," Stiltner notes.

Armando Filho, Director of Material Management at Vallair has noticed that the teardown market has been continually active during the COVID period for both narrow and widebodies. With regards to Vallair's main actions on

passenger-to-freighters for the A321, the company sees opportunities for the APS3200 APUs, but rare requests for GTCP36s – “We predict that prices will be basically stable and higher for the APS3200 when comparing with GTCP36s because the former are higher demand in the market and preferable for operators due to their configuration and reliability,” Filho says.



Armando Filho, Director of Material Management at Vallair

Despite the increase in scheduled flights and utilisation, Stephen Damron, Senior Product Line Director at Kellstrom Aerospace reckons the future brings many uncertainties. He says operators, more than ever, are approaching these uncertainties with a general aim to mitigate planned and unplanned downtime associated with this flight-critical system and have been turning to strategic partnerships with expert maintenance providers and their networks. “The trends Kellstrom are seeing lean heavily towards monetisation of current feedstock inventories which include both general maintenance, restorations, and preservation events.”

Supporting new start-up carriers

Several new airlines have sprung up in the wake of the pandemic with

some scrambling to enter cost-effective maintenance programmes, including for APU services.

“A comprehensive maintenance plan will consist of several components,” Damron suggests. He says the foremost element of a successful MSP will be a reduction of aircraft downtime. “This is achieved by streamlining the overall maintenance process with cost-effective solutions inclusive of the management of future maintenance needs with the coming budget cycles.”

Kellstrom supports and is strategically aligned with a large network of OEMs, operators, and MROs through one of its strategic business units with coverage of highly utilised commercial narrowbody and freighter platforms, Damron mentions. “Whether Kellstrom acts on behalf of the operator as a complete asset manager, a technical maintenance advisor, or through the utilisation of our lease pool engines, we have concrete solutions for every priority and budget,” he adds.

The “right” answer for start-up providers will of course depend on multiple factors, such as fleet size, operational climate and overall utilisation. That said, at StandardAero, they noticed a significant trend in operator requests for T&M programmes with not-to-exceed



Stephen Damron, Sr. Product Line Manager at Kellstrom Aerospace

“Usually, the OEMs will come with an exchange programme and pool stock offer, however the cost will be higher compared to sourcing an SV unit from the market.”

Armando Filho, Vallair

(NTE) cost coverage, which Stiltner says helps larger fleets mitigate their overall risk profile. He adds that while this may be a good option for larger fleets with more predictable shop visit requirements, it may not always be suitable for smaller fleets or for those operators interested in a more hands-off approach. “In these cases, operators may benefit more from a ‘flat rate’ or hourly based maintenance programme. Ultimately, the type of programme selected will depend on the operator’s specific needs,” he suggests.

Armando from Vallair sees that the decision by start-ups will depend on whether the carriers are willing to invest in their own stock, consignment stock, pool stock or exchange programmes. “The decider will be the way in which they choose to manage the availability of assets to support their fleet.”

Armando also explains that in terms of cost and benefits, they will benefit from pool agreements or on-site stock or consignment instead of investing in purchasing due to cash flow spending – “Another option would of course be an exchange programme, but that is very much linked to market availability and potentially generate AOG costs. It is better to be preventive instead of reactive.”

New opportunities while supporting current platforms

The aircraft OEMs are working diligently to get aircraft delivery rates back to pre-COVID levels. For 2022, Forecast International’s analysts currently expect Boeing and Airbus to deliver 455 and 702 commercial jets, respectively.



The PW901 is now primarily a cargo market application.

Photo: StandardAero



OEMs will usually come with an exchange programme and pool stock offer.

Photo: AFI KLM E&M

Compared to the 2021 level, this is a 33.8% increase for Boeing and a 14.9% increase for Airbus.

"Usually, the OEMs will come with an exchange programme and pool stock offer, however the cost will be higher compared to sourcing an SV unit from the market, comments Armando. He says operators will guarantee availability, reliability and warranty support, "but again this decision will be based on what the operator would like to have in terms of cash control or units' availability or managing the risks and AOGs by

themselves."

The majority of APUs supported by StandardAero – such as the APS 2300, GTCP 36-100/150 and RE220 – equip regional aircraft, with a fourth product – the PW901A/C – now primarily being a cargo market application – "As such, we have benefitted from the resilience shown by these two market segments over the past two years, says Stiltner.

The Embraer E-Jets E1 family has proven especially resilient during the pandemic, and Embraer itself forecasts demand for 500 new E175-E1s in North

America over the next decade, this 76-seat regional jet is proving to be right-sized for many carriers as they return to health.

"In terms of new generation platforms, StandardAero is always looking for new ways to support our customers and our OEM partners, and our status as a trusted provider of APU support to operators worldwide will remain a central focus of our growth strategy going forward," Stiltner continues.

At Kellstrom Aerospace, the primary focus is with commercial narrowbody variants and freight operators. Damron reports that this includes but is not limited to GTCP331-, GTCP36-, APS3200, APS2300. "Where crossover exists, such as the Honeywell 131-9 family, we plan to continue to provide support for the foreseeable future.

"Some variants currently being evaluated for more comprehensive APU support are the 787, MAX and 777X," he concludes.

Another trend that we have noticed is customer interest in switching from existing APU maintenance programme providers to new MRO partners who are more focused on creating customised programmes tailored to the operator's specific APU maintenance needs.

Coty Stiltner, StandardAero



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Serviceable material demand leads to surge in **teardowns**

END-OF-LIFE ASSETS



Serviceable material demand is at one of the highest peaks.
Photo: Ascent Aviation

As the aviation industry climbs out of the pandemic, **Keith Mwanalushi** looks at the impact on the teardowns market analysing the aircraft types and demands for serviceable inventory components.

Salvaged parts from aircraft teardowns continue to show increased market demands as aircraft operators ramp up their operations post-pandemic. Many of the aircraft that were in storage are returning to service and those that are not, most of the high-demand components are going into the parts market.

"We have seen a rather significant uptick in reclamation projects over the past 12 months as airlines and lessors emerged with a clearer picture of their capacity needs in the post-pandemic world," comments Mike Scott, Senior Director of Sales at Ascent Aviation Services. The company has been busy at its reclamation and teardown unit at its Marana and Tucson facilities over the past year and has also performed several teardown projects at the new Roswell facility over the past few months.

"We have a very robust reclamation



Mike Scott, Senior Director of Sales at
Ascent Aviation Services

quality process that has been formulated based on our many years of teardown experience, which covers all aspects of the project from pre-induction checklist items to the ultimate crushing of the airframe for recycling at the end of the project," explains Scott. Additionally, Ascent is AFRA accredited and follows the AFRA Best Practices Manual. "As each project has a bit of uniqueness due to the differing operator requirements, we do work closely with our teardown customers to tailor each quote to the specific needs to control costs, increase efficiency, and work towards timely completion of the project," he states.

Over at Magellan, they see that teardown demand has decreased even though more end-of-life assets, both airframe and engines are coming to the market. "There are many variables that determine trends in the number of idle aircraft. Factors include the

“We have seen a rather significant uptick in reclamation projects over the past 12 months as airlines and lessors emerged with a clearer picture of their capacity needs in the post-pandemic world.”

Mike Scott, Ascent Aviation Services



Salvaged parts from aircraft teardowns continue to show increased market demands.
Photo: Ascent Aviation

capacity of OEM new aircraft deliveries, the war in Ukraine, and ongoing staffing issues among pilots and cabin crew,” observes Richard O’Grady VP, Trading and Asset Management at Magellan.

O’Grady questions if demand will affect airlines’ capacity, and consequently, if airlines will keep their surplus fleet parked until insufficient staffing levels and fuel prices have improved – “The ready availability of teardown slots seems to point towards airlines holding on to assets for the time being, thereby increasing the number of idle aircraft,” he suggests.

Magellan is increasing recovery efficiencies by proactively establishing cooperative relationships directly with AFRA accredited teardown facilities. O’Grady adds that strategic partners have approved processes and procedures under AFRA BMP.

“We see no slowdown in aircraft availability for teardown, quite the opposite actually,” notes Jason Reed, President at Flight Solutions Group. “Manufacturers are ramping up deliveries of their newer technology single-aisle assets, which drive airlines to release more of the older aircraft

and engines to the aftermarket.”

On the flip side, Reed says although idle now, many widebody aircraft are also starting to be re-activated – “The slowest sector to return on that front continues to

be the Asia Pacific operators.

“The demand profile for single-aisle teardowns has grown tremendously with the lack of availability of new parts in the industry. Additionally, with long lead and repair times on the rise, tagged serviceable material demand is at one of the highest peaks we have seen,” Reed indicates.

At Magnetic Trading, the last teardown was in 2019 and they were able to sell most of the stock before COVID hit – “We have not done any teardowns within the last year, but we acquired several landing gears, engines and packages. We starting to see high recovery signs on the components market as well as increased interest for the teardowns,” says Eigirdas Keblikas, VP Asset Trading and Leasing at Magnetic Trading. “We could clearly see that cargo aircraft demand has a huge influence for the teardown market especially on the 737-800NG platform, as most of the aircraft are going for cargo conversion instead of teardowns.”

Keblikas notes that increased demand for USM might push companies to proceed with a teardown project even with a



Richard O’Grady, VP, Trading & Asset Management, Magellan

“**The demand profile for single-aisle teardowns has grown tremendously with the lack of availability of new parts in the industry. Additionally, with long lead and repair times on the rise, tagged serviceable material demand is at one of the highest peaks we have seen.**

Jason Reed, Flight Solutions Group



Jason Reed, President, Flight Solutions Group

higher acquisition and increased cost on transportation and repairs – “We do see a right timing for teardown acquisition at the moment,” he says.

Armando Filho, Director of Material Management at Vallair feels that the market is looking to see more teardowns for both narrow and widebodies to reduce cost, increase revenues, and avoiding new parts from OEMs with high prices. He says these aircraft will still have good and reliable parts and components in AR condition that could be repaired and overhauled to support fleets and especially new operators in terms of cost benefit and safety. “Due to growing numbers of teardowns inducted during last two years, the prices are competitive, and there is currently a good opportunity to buy assets to prepare for a post pandemic market where I believe that demand will increase and will shortly reach or

superseding numbers pre-COVID.”

The growing number of teardowns require developing operating procedures that ensure efficient handling of the entire process from start to finish.

“You must have an experienced team, dedicated planning, management and control on all parts teardowns,” Filho points out. “It is also crucial to evaluate which parts should be considered to keep and remove based on the market demand and price, but also the cost to stock and repair.”

Filho says these must align with proper certifications to proceed with teardowns and if possible, having dedicated hangar space to proceed with such an operation – “To have the teardown done by a third party could be costly, but it would all depend on the age and condition



Eigirdas Keblikas, VP Asset Trading and Leasing at Magnetic Trading

of the aircraft and top components.”

Jasper van den Boogaard, VP Airframe Acquisition and Trading at APOC and an ISTAT certified appraiser argues that for teardowns, there are fewer aircraft available today because the ones still in an airworthy condition are lined up for the summer season. “At APOC, we have good levels of stock readily available, we hear from the industry that obtaining parts has already become more difficult.”



Jasper van den Boogaard, VP Airframe Acquisition & Trading, APOC

APOC has an upcoming 737-800 teardown project that will be fully managed by APOC from day one and aircraft operators are able to acquire parts directly from the project. “Airframe part-outs are very labour-intensive because a lot of parts are taken off the aircraft, for this reason, we automate as much as we can with an in-house developed logistics system,” says van den Boogaard.

In the COVID period fewer aircraft flew and so aircraft that were parted out increased stock levels. Van den Boogaard observes that with an increased supply and lower demand, the prices of parts were reduced. “Just over a year ago, the demand for parts stabilised mainly because narrowbody aircraft were flying again and today even exceed pre-COVID levels. However, we see a slow trend in increased airframe part prices driven by stock levels

that are quite rapidly decreasing.”

Inventory demand versus USM prices

At Ascent Aviation Services, they have seen a huge demand for both 737NG and A320 family aircraft teardowns over the past 12 months, as these are the most common aircraft types that are going to reclamation. They are also seeing A330's, 777's, 767's, E190's, and CRJ's going for teardown. Mike Scott reports that the most recent experience with Ascent's flightline and heavy maintenance projects being performed under the Class IV 145 Repair Station Certificate, they are finding that some parts are hard to come by, which is a result of most MRO's running at full capacity to RTS and check aircraft, so the demand is certainly there.

Natascha Greenier, VP, Teardowns at Magellan sees 737NG material driven by increased market recovery and the number of freighter conversions taking place. She says this requirement for aircraft conversions means fewer assets being available for teardown, increasing the demand on the market. “We see a similar curve for Airbus narrowbody USM. However, Airbus demand is more readily satisfied than that of the B737NG due to greater asset availability. The highly sought-after NG USM is holding its value compared to the Airbus narrowbody USM, given the demand for surplus material available in the aftermarket.”

Magellan is actively

evaluating Boeing and Airbus assets. Short-haul narrowbodies and their respective engines (V2500, CFM56-5B/7B) are of particular focus for Magellan. Greenier indicates that they are assessing opportunities in the CRJ900 and GE90-115B markets as well.

Clearly single aisle is the leader, with some resurgence now on the regional jets, monitors Jason Reed noting that 90% of the aircraft flying are within those sectors, with widebody aircraft slowly ramping back up. “However, we do not see increases in USM pricing, at least not at an across-the-board level. Individual parts may have their own increases due to minimal quantities available and long repair times,” he states.

In terms of further asset acquisitions, Flight Solutions Group are opportunistic buyers and frequently evaluate new product lines frequently. Reed says with that type of approach, you can steadily grow product lines into the portfolio – “The key now is looking forward at products about to peak or have just gone through their prime on both the airframe and engine side. The entire equation has changed today with the pandemic recreating completely different airline network demands.”

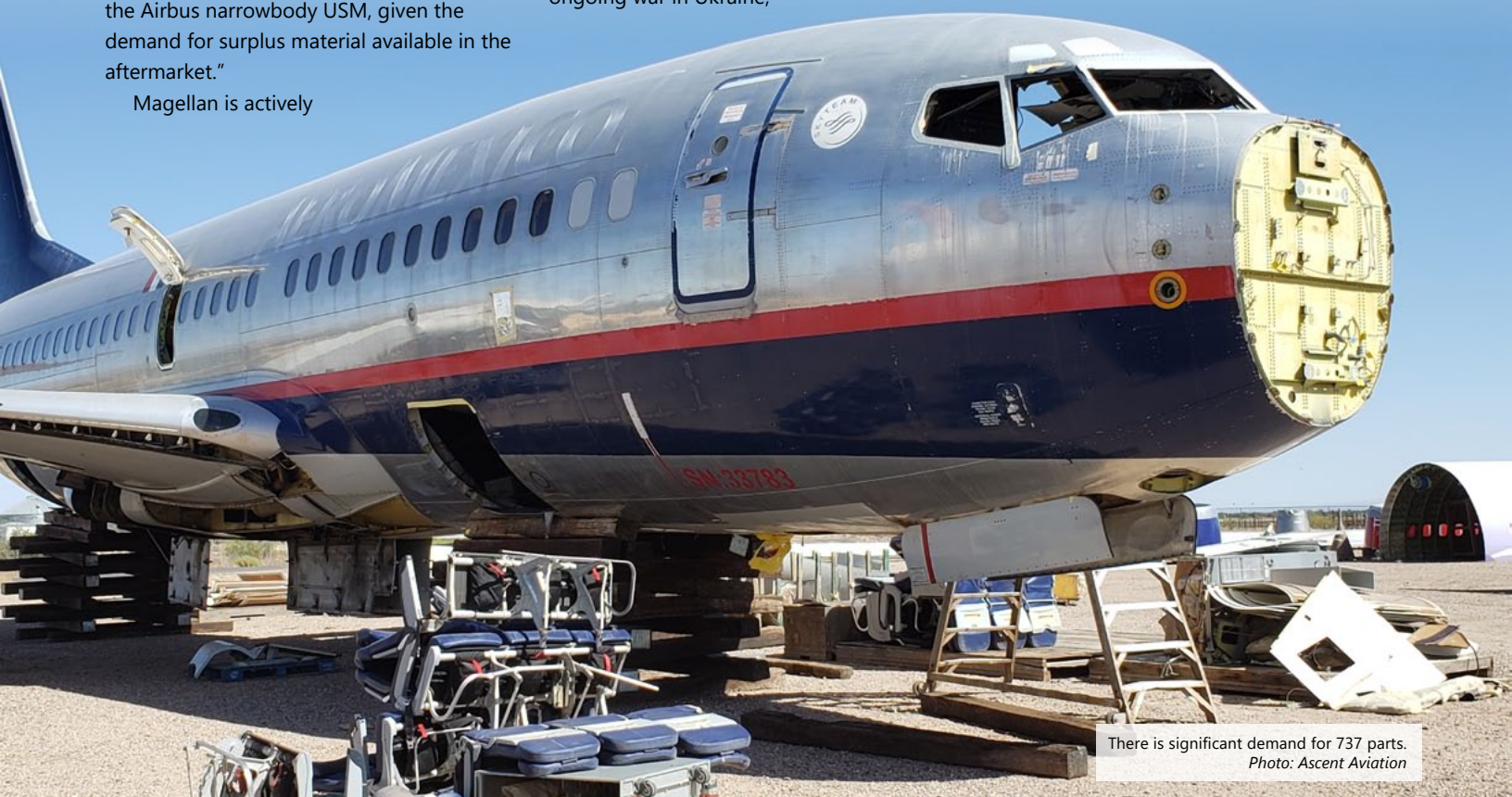
Despite the severe impact of the pandemic on the global aviation industry, as well as the uncertainties that come with the ongoing war in Ukraine,

Magnetic Trading also see increased demand for 737NG inventory as well as growing demand for A320 family too. Eigirdas Keblikas understands that these are slowly starting to push USM pricing up to the pre-pandemic levels especially with high level of inflation around the world.

“We believe that in next six to 12 month we will have way higher levels in the price of USM for narrowbody planes. Sunset assets like 737CLs or its engines are also increasing its value due to higher demand,” says Keblikas.

Vallair is very focused on A321, A330 family and in the future 777 teardown and maintenance. There is major emphasis on the A321 P2F programme, aligned with maintenance support on A320, 737 and A330 family at Vallair's own hangars in Montpellier and Chateauroux where they have invested significantly recently. “These will remain our focus, however we see a good market for the 737NG, but we will not be focusing on teardown,” reports Filho.

Filho lists the top components that are the most interesting in terms of ROCI (return on capital invested) including nacelles, landing gears, APUs, wheels and brakes, engines and LLPs items. Looking ahead, Vallair will continue to be focused on A321, A330, CFM56-5B and V2500 engines/ nacelles and on PW4000 Nacelles.



There is significant demand for 737 parts.
Photo: Ascent Aviation

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Q & A

In the
hot seat...

Fraser Currie
Chief Executive Officer
Joramco



You took the helm at Joramco during the tail-end of the pandemic. What pressures did that bring?

Thankfully having been part of the Joramco executive team for the last four years, dealing with the effects of the pandemic was business as usual. Thankfully, our staff and customers stayed healthy, and we successfully navigated our way through the Omicron spike at the beginning of 2022. The main pressure points we felt and continue to feel is in the supply chain. Materials and parts supply are still being heavily impacted both in terms of customer supplied parts and Joramco supplied parts. The delays in supply have a direct knock-on effect to aircraft turn times, which we try to minimise through managing our early milestone inspections. However, there is an impact on many projects, therefore the greatest pressure comes from managing customer expectations.

Briefly, tell us about the transformation that Joramco has attained in recent years?

Joramco commenced "Our Transformation Journey" in October 2017. We are now in our fifth year and the transformation journey continues. The journey has been one of "Continuous Improvement" which we branded as "Our Transformation Journey," the branding is an important feature as it increased our visibility to the market and gave both existing customers and potential customers a very detailed insight as to what we were improving, be it: capability or process. In brief the transformation continues to focus on: Our People, Our Process's, Our customers and stakeholders. Training and especially



The supply chain is the main area that is having a detrimental effect on business currently.

"Enhancing the Safety Culture" are areas of continuous improvement that are always top of the agenda for Joramco.

What is the main significance of Joramco's recent EASA Part-147 0204 Approval Certificate?

Receiving our EASA Part-147 was a fantastic achievement by the entire team in our academy. Joramco has previously worked with international partners to support our academy training courses, however, given the importance of attracting new talent into our business, it was time to take full control. The main significance of the Part 147 to Joramco is the link to our Part 145 organisation and our ability to offer a full package to students including their experience training. Recently we have

started providing training for third party MRO's and we are delighted to do this as it can only enhance the flow of talent into the industry as a whole.

As aviation moves on from the COVID crisis, what is your key priority for Joramco going forward?

Joramco's key priority is to our customers and providing them with consistency in turn times, compliance and high standards of safety. Whilst compliance and safety standards are within our own control, we are actively seeking the support of the OEMs to improve the supply of parts and materials. In essence we are seeking to ensure that any post covid "new norm" is not at the expense of the accepted norms prior to the pandemic.





Joramco recently announced a five-year heavy maintenance agreement with Ryanair.

Are you seeing any significant challenges in the MRO supply chain as markets recover?

The supply chain is the main area that is having a detrimental effect on our business currently. The lead times for key parts are impacting the throughput of aircraft. We are told it is a combined effect of Covid and the time required to ramp up to pre-covid levels. The delays are not limited to one or two days with some materials having zero visibility in the market.

There is a global shortage of technical expertise. What is the situation in the Middle East?

The ongoing global shortage has not been helped by Covid and many people that had to leave the business are not returning which is compounding the shortage. As I see it, the Middle East remains an attractive location for many seeking to both join aviation and for

those looking to continue and further their careers. Thankfully Joramco did not have to reduce staff levels due to Covid and we continued to fill our training courses in the academy, therefore we have definitely suffered less than some others. I encourage all my peers to remain focused on training programmes as the industry shows no signs of shrinking. The challenge as always is how to present our industry as a positive career choice to new potential engineers.

What impact are the growing global sustainability initiatives having on Joramco's MRO operations?

Joramco is committed to sustainability initiatives and works with our parent company; Dubai Aerospace Enterprise, via our Environmental Social Governance (ESG) programme to ensure a focused approach. ESG will be a defining theme for companies over the coming decade, and we are committed to becoming

a more sustainable company. The purpose of our ESG reporting is to provide disclosures and transparency to our stakeholders, ensuring that we hold ourselves accountable to our commitments and our actions to support the transition to sustainability initiatives.

What are you most looking forward to in the coming months?

The next few months have some exciting projects planned ranging from B777 longeron modifications, additional B737 pickle fork replacements and several aircraft part out and dismantling projects. These projects coupled with a busier summer maintenance schedule than in previous years are giving us lots to look forward to. We also look forward to the industry events such as: MRO BEER and Aircraft Interiors in Hamburg. Finally, it will be nice to take some time out for holidays too!



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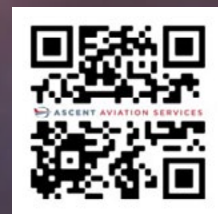
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»»»» — on the move



Andrew Newell

Andrew Newell has taken over the role of General Manager at Bii. aero, an expanding provider of aircraft parts and services for the aviation sector. After two years as Bii's Sales Director, Newell is bringing his highly specialised expertise of consignment stock management and the commercial aircraft interiors sector to the role. Newell is planning to build up the size and capabilities of the company, firstly by reconfiguring all

the warehouses. "We are investing significantly in our stock levels to accommodate the rising demand of Bii's component support services. All the new inventory coming in will add a constant feed of activity into the business for the next few years and spearhead Bii's growth trajectory.



David Kahl

FL Technics, a global provider of aircraft maintenance, repair, and overhaul (MRO) services and a part of Avia Solutions Group, has appointed **David Kahl** as COO of its wheels and brakes business in Hanover, Germany. Kahl has worked in the aviation industry for nearly eight years and has extensive knowledge and experience in the wheels and brakes segment. Having previously worked at Lufthansa

Technik, he took on responsibilities

of build-up and co-project management for the establishment of a wheel shop, product sales for wheels and brakes services, as well as taking on full budgetary responsibility with a focus on commercials. His new role as COO will see him taking charge of FL Technic's wheels and brakes services in Germany, working with the team to grow and expand the company's footprint in the market.

Pro Star Aviation, an innovative aerospace modification centre, has promoted **Ed Monaghan III** as the new Director of Maintenance. With significant growth, Pro Star Aviation made strategic changes

to enhance the team's structure. Ed Monaghan III attended the Spartan College of Aeronautics and Technology in OK and launched his Aircraft Maintenance career with American Eagle Airlines in Boston, MA. He joined the Pro Star team in 2005 as an Aircraft Maintenance technician, moving up to Chief Inspector.



Rob van de Graaf

From June 1, 2022, **Rob van de Graaf** has been appointed Commercial Director of EPCOR, the 100% subsidiary of AFI KLM E&M based in Amsterdam, specialising in APU and component support. Van de Graaf builds upon an impressive career in various regions in Europe, the United States and Asia. He started his 30-year aviation career in 1988 at Fokker Aircraft working in the customer support organisation. He gained experience

at AAR in various commercial roles and was involved in various customer support, business development and sales roles. Van de Graaf was involved in the development for a component maintenance facility in China where he was based in Shanghai. In the Asia Pacific region, he worked for HEICO and MTU where he was successful in engine contracts with various carriers in South-Korea, Indonesia and Australia. After a short adventure in Turbine Aero, he was asked to lead the commercial department of EPCOR, which fitted in well with van de Graaf's desire to return to his roots in The Netherlands.

Nordic Aviation Capital (NAC) has announced that **Brian Power** will assume the role of EVP Fleet Operations effective July 1, succeeding **Tom Turley**, who is retiring from his role as EVP and COO at NAC. Power has over 30 years of experience in the aviation sector. He joined NAC in 2016 as VP Technical and was appointed GVP Transaction Asset Management in 2017. He assumed the role of SVP Technical Operations in 2019. Power previously worked for Aldus Aviation as Head of Technical and at Lufthansa Technik for 21 years overseeing a wide array of commercial aircraft in various senior roles. He will be responsible for leading the technical activities across the business and will report to the company's President and CEO, **Norman C.T. Liu**.



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