

MRO

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2019: A year in review

In focus:
Setna iO
Paint and coatings
in aerospace

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Opinion

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Smiles from the threshold of the year to come

As another year draws to a close we think it's only fitting to end with some thoughts from our esteemed readers on the prospects and challenges that will shape the new year. Roger Ross from StandardAero told us that their biggest challenge will probably remain new material supply, which directly influences the ability to ramp-up in response to customer demand. As busy as 2019 was, they could have sold, inducted and delivered even more engine events were it not for the shortage of certain critical parts, especially hot section LLPs for some of the larger engines they support.

The first challenge that the aftermarket sector will face in 2020 is of course the development of digitalisation. Liebherr-Aerospace for instance has been working on such new digital services to support the quality level and on-time performance. That is why in 2020 they will propose more reactivity and traceability to customers through a service platform offering customised solutions answering

their new expectations.

Another challenge will be the multiplication of aircraft retirements that will be an important source of USM parts. Major actors are coming into this market, which brings complexity to assess the value of the units. At Liebherr-Aerospace, they mentioned having specific and centralised procurement process ensuring traceability of the parts they select, and a qualified recertification process enabling the company to propose additional warranty to these units.

Our cover story provides more interesting insights into 2019 and expectations for 2020.

On that note, everyone at AviTrader Publications wishes all our esteemed readers, advertisers and editorial partners an enjoyable holiday season and greater prosperity in 2020!

Editor



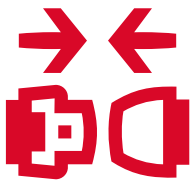
Photo: Volotea

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Official opening of Sabena technics' fourth paint shop in Toulouse, France
Photo: Sabena technics

Sabena technics opens new painting facility

Sabena technics has opened its new painting facility, dedicated to long-range aircraft. Building this facility is part of the Sabena technics Group's strategy to develop its painting division in Toulouse and effectively support major aerospace customers such as Airbus by providing them with solutions to efficiently support their A350 production. The paint shop is the fourth of the Toulouse site. It is to meet the needs of the manufacturer that Sabena technics has invested more than €20 million in this new 7500 m² facility equipped with a ventilation system with a capacity of 500,000 m³/h and an optimal docking for long-range aircraft. Also designed to minimize its environmental impact, the room is equipped with a heat recovery system and industrial water treatment. The painting teams, recruited and trained since 2018, have already started the activity and welcomed their first A350 aircraft for painting. More than 80 recruitments have been made.

Jetaire receives ANAC certification for B737 series

Jetaire has received certification from the National Civil Aviation Agency of Brazil (ANAC) for its Invicta™ Reticulated Foam Ignition Mitigation system for the B737 (300-800)-series aircraft (Certificate #2019S11-06). Invicta is Jetaire's innovative solution for fuel tank flammability reduction (FTFR) compliance. Jetaire is the original developer of the Invicta reticulated foam technology and has the only

patented foam-based solution as a means of compliance with fuel tank requirements of FAR 25.981.

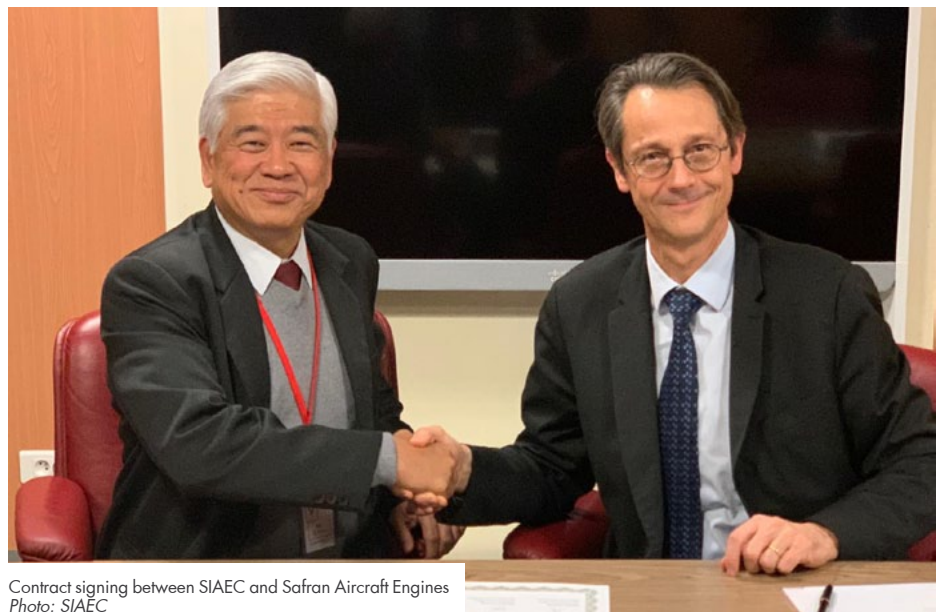
Southeast Aerospace receives PMA for Garmin G5000 harness

Southeast Aerospace, the aerospace solutions company, was granted an FAA PMA to manufacture and distribute complex harnesses required for the Garmin G5000 installations. The Garmin G5000 is an Advanced Flight Deck with three wide, high-resolution displays with integrated engine indicators and crew alerting system. With full WAAS FMS in-

tegration and dual-channel digital control system, the package provides the latest in satellite-based navigation capabilities and digital flight management tools. Harnesses for the G5000 are an intricate component of the installation for Citation 560XL/XLS or the Beechjet 400A. Due to the complexity of the harness, every harness is tested using automated harness test equipment. Each wire is laser marked and connectors are tagged to facilitate straightforward installation.

SIA Engineering Company signs maintenance services agreement with Safran Aircraft Engines

SIA Engineering Company (SIAEC) and Safran Aircraft Engines have signed an agreement for SIAEC to provide engine maintenance services to Safran Aircraft Engines. The 10-year agreement encompasses engine Quick Turn (QT) and modification embodiment services for both CFM LEAP-1A and LEAP-1B engines. SIAEC will set up a dedicated facility with the latest engine and QT processes and state-of-the-art technology to support these services. The facility is expected to commence operations in 2020. The LEAP-1A is one of two engine options for the Airbus A320neo family, while the LEAP-1B is the exclusive powerplant for the Boeing 737 MAX. The LEAP engine is a product of CFM International, a 50/50 joint company between GE (United States) and Safran Aircraft Engines (France). This engine has experienced the fastest order ramp up in commercial aviation history and CFM has received orders and commitments for a total of more than 18,750 LEAP engines to date.



Contract signing between SIAEC and Safran Aircraft Engines
Photo: SIAEC



Volocopter has been awarded Design Organisation Approval from EASA
 Photo: Volocopter

Volocopter first eVTOL startup to receive Design Organisation Approval by EASA

Urban Air Mobility pioneer Volocopter has released that the European Aviation Safety Agency (EASA) has awarded the company Design Organisation Approval (DOA) following a series of thorough audits. The approval is a confirmation by EASA that Volocopter is performing its tasks as an aircraft manufacturer in a controlled and safe manner. As an approved Design Organisation, Volocopter has a competitive edge in development speed, while guaranteeing the highest safety standards. Volocopter is the first eVTOL startup on record to receive DOA with vertical take-off and landing (VTOL) as scope of work worldwide. "Receiving this seal of approval from EASA is testament to our rigorously professional processes, world class team, and devotion to safety here at Volocopter," says Jan-Hendrik Boelens, CTO and Head of Design Organization of Volocopter. "Design Organisation Approval is a crucial step towards receiving commercial certification and brings air taxis ever closer!" says Florian Reuter, CEO of Volocopter.



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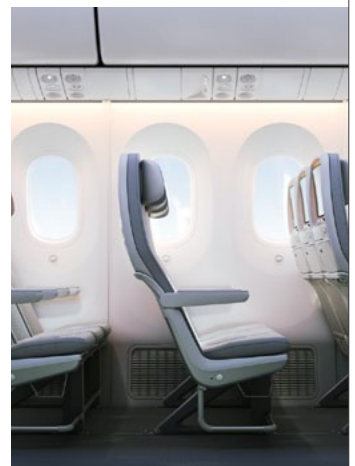
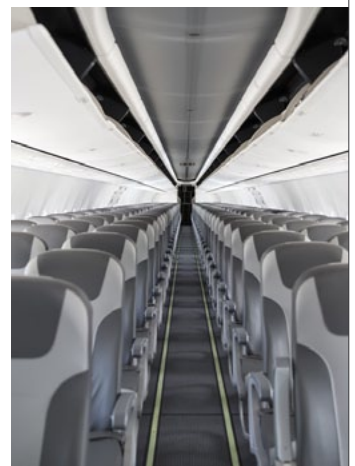
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Grand opening and ribbon cutting ceremony of Recaro Aircraft Seating's newly expanded production facility in Qingdao, China
Photo: Recaro

Recaro Aircraft Seating expands production facilities in China

Recaro Aircraft Seating inaugurated its newly expanded production facility in Qingdao, China on December 9. The inauguration concludes the second phase of the space2grow initiative, a major global expansion project Recaro started last year to support its continued growth. With its newly expanded facilities, Recaro Aircraft Seating China will be equipped to take on the thriving market opportunities and lay a solid foundation for further growth in the Asia Pacific region. The new Recaro production facilities measures roughly 7,500 m². It is provisioned to accommodate up to five new assembly lines which will increase the maximum production capacity of Recaro's China plant to 60,000 seats per year, readying the company to meet the needs of customers in both the Asia Pacific region and the rest of the world. The investment in the Qingdao plant forms part of the global Recaro space2grow initiative, an ambitious expansion strategy aimed to secure, sustain and expand the company's growth. Space2grow is a multi-million investment project launched in 2018. Through the acquisition of additional land and investment in new buildings and renovations, it aims to significantly increase the production of Recaro seats across the world as well as office and social space.

Magnetic MRO Training receives Airbus A320neo LEAP 1a and PW1100G type training approval

Magnetic MRO Training, an international EASA Part-147 approved type training organization, has received an approval to provide Airbus A320neo LEAP 1a and PW1100G type training. The new capability's scope ranges from Airbus A320ceo/neo difference course to full Airbus A320neo type-training

for specialists with no previous background on the type. Alongside the newly introduced Airbus A320neo training, Magnetic MRO provides Airbus A320ceo, Boeing 737 Classic/Next Generation, and Bombardier CRJ700/900/1000-type training courses, as well as various internal company training. The training is conducted at Magnetic MRO's training facility in Tallinn, Estonia which was improved and expanded in fall 2019

GA Telesis and HAECO ITM sign post-airframe teardown consignment sale agreement

HAECO ITM, a member of the HAECO Group, has acquired a Cathay Dragon Airbus A330-300 (MSN083), for disassembly and has partnered with GA Telesis' Component Solutions Group for the distribution and resale of the parts removed from the aircraft. Once the components are recertified, they will support HAECO ITM's inventory pool as

well as GA Telesis' customer base worldwide. A joint venture between HAECO and Cathay Pacific Airways, HAECO ITM offers services that include the provision and pool management of aircraft components. HAECO ITM currently manages a fleet of over 290 aircraft from an inventory pool located in Hong Kong.

GMF AeroAsia and SR Technics partner on component services for Garuda Indonesia

MRO service provider SR Technics has extended its partnership with PT Garuda Maintenance Facility AeroAsia (GMF). As per the agreement, effective November 1, 2019, the two parties will be providing Integrated Component Services (ICS) for Garuda Indonesia's fleet of Airbus A330neo and Airbus A330ceo aircraft. As the first Airbus A330neo integrated component services contract for SR Technics, this agreement marks a milestone for the company, which has been working with Garuda Indonesia Group for over 30 years, and further strengthens its long-standing business relationship with GMF AeroAsia. Building on existing Integrated Component Services (ICS) agreements for the airline's Airbus A330 and Boeing 737NG fleets, the new contract will support the continuous improvement of component repair processes and turnaround times. The contract covers component maintenance and flexible availability solutions, including the management and maintenance of components under a flight-hour rate. Services will be provided by the SR Technics Center of Excellence for component maintenance in Kuala Lumpur, Malaysia, and its operational headquarters in Zurich. The contract also includes on-site support, pool access, logistics and facilitated leasing.



Contract signing between GMF AeroAsia, Garuda and SR Technics
Photo: SR Technics

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Photo: British Airways 3D printing

British Airways explores possibility of using 3-D printers to create aircraft parts

British Airways is exploring the possibility of using 3-D printers to create aircraft parts in the future. These printers would be located at airports around the world to reduce delays for customers and emissions caused by transporting items. The airline's innovators predict that non-essential cabin parts will be first on the list to be generated, including pieces of tray tables, entertainment systems and toilets. While these components do not impact the safe operation of the flight, they can reduce the number of seats or toilets available for customers and cause delays as engineers wait for the parts to be flown to wherever the aircraft is. 3-D printing is an essential step towards the sustainable future of aviation, as the printers can produce parts that, while as strong and durable as traditional components, weigh up to 55% less. Every kilogram removed saves up to 25 tons of CO2 emissions during the lifespan of an aircraft.

Ipeco establishes new repair facility in Beijing

Ipeco, a recognized leader in aircraft crew and executive passenger seating and a growing manufacturer of aircraft galley inserts, has announced further expansion across the Asia Pacific region. Following its recent inauguration of a Singapore distribution and repair facility, Ipeco has opened a Beijing repair facility to complement its Hong Kong distribution centre in Greater China. The facilities in Beijing and Hong Kong are both managed by General Manager, Christina Chong. The Beijing start-up capability includes cockpit seating for Boeing 737, 767, 777 and 787 series, as well as all crew seating for Embraer E2 series aircraft with galley insert repair capability being added

later in 2020. The Ipeco range of crew seats is built to uncompromisingly high standards and subjected to extensive test programmes for both Part 25 and Part 23 certification, including Boeing, Embraer, Airbus, ATR, Gulfstream and Lockheed applications. Ipeco's executive passenger seating frames, and fully upholstered seats, can be found across several Bombardier and Textron business aircraft. Ipeco also has an increasing portfolio of galley inserts on board A350, A380, B787 and B777X platforms with ovens and water heaters available on A320 narrow-bodies.

Solvay supplies high-performance thermoplastic film to Safran

Solvay has signed an agreement with Safran to supply Halar® ECTFE high-performance film for its LEAP engine acoustic panels. Film made from Halar® ECTFE with additional plasma treatment offers excellent adhesion to composite substrates providing superior aesthetic surface aspects to perfectly blend with its surroundings. Solvay's high-performance Halar® ECTFE, a partially fluorinated semi-crystalline polymer, is used as a protec-

tive layer on the engine acoustic ring panel against the aggression of the harsh environment typical of the entrance of an aircraft engine. It is strong and tough and its resistance to erosion, abrasion, and aircraft chemicals and fluids make it ideal for this application. "Solvay is a longstanding and trusted partner of Safran, delivering advanced composite material solutions for both our aircraft engines and nacelle programs," said Thierry Haud, Vice-President Safran Purchasing, Safran. "The supply agreement for Solvay's high-performance thermoplastic film extends our mutual collaboration and further consolidates the relationship between us as we enlarge our cutting-edge portfolio of materials, techniques and processes."

FAI Technik completes ADS-B and FANS installations on Bombardier Challenger 604s

FAI Technik GmbH, the German MRO supplier and member of the FAI Aviation Group, has completed FANS installations on two Bombardier Challenger 604s (D-AFAA and D-AFAG) during October/November. It has also just commenced a further installation, scheduled for completion by mid-December 2019. Simultaneously, FAI Technik GmbH has received an EASA-STC for a Garmin ADS-B solution for a Bombardier Learjet 60, designed by FAI Engineering in collaboration with FAI's Part 21-Design Partner S4A, located in Madrid, Spain. With three Learjet 60 ADS-B modifications already completed, FAI Technik is now seeking to modify another three Learjet 60 models before year end. This will mean that FAI's entire Air Ambulance fleet, comprising six Learjet 60s, plus four Challenger 604s, will be ready for unrestricted Transatlantic flying by the end of this year. Its six other European-based Learjet 60s are scheduled for ADS-B modification in the first and second quarters of 2020, respectively, in time for the EASA mandate by June 2020.



FAI's entire Ambulance fleet comprising six Learjet 60s and four Challenger 604s will be ready for unrestricted transatlantic flying by the end of this year
Photo: FAI Technik



Pratt & Whitney to invest US\$30 million in West Virginia facility
Photo: P&W

Pratt & Whitney invests US\$30 million in West Virginia facility for maintenance, repair and overhaul of PW800 engines

Pratt & Whitney has reported a US\$30 million investment in its engine services facility in Bridgeport, West Virginia for the maintenance, repair and overhaul (MRO) of PW800 engines. Specifically, the site will service the PW814GA and PW815GA engines that power the Gulfstream G500 and G600 aircraft, respectively, with the capacity to expand its capabilities to other PW800 engine models in the future. "As part of the next phase of the successful entry into service of the PW800, we have chosen the Bridgeport facility to provide MRO services for the engine family. This decision was based on the site's wealth of technical expertise in business aviation engines and its excellent record in providing quality, speed and value for our customers," said Satheeshkumar Kumarasingam, Vice President, Customer Service, Pratt & Whitney. "Adding the game-changing PW800 engine to their repertoire of business aviation engines will equip and upskill the facility with high value service engineering jobs."

Recaro Aircraft Seating breaks ground on new expansion project

Recaro Aircraft Seating has broken ground on its latest expansion project, which features a new customer service area, a flame lab and crash facility. In total, Recaro has acquired an additional 45,000 m² and will invest €40 million (US\$44 million) in the new buildings. The Customer Service area will improve operational processes by connecting all production, administration and logistic areas via a central meeting axis. Scheduled for a spring

2021 launch, the new flame lab will ramp up the facility's testing capabilities by seamlessly integrating the fire test chambers with the flame certification tests. By 2021, the new crash facility will be able to run 300 dynamic crash tests a year at the site for the certification and development of passenger seats. Recaro Aircraft Seating is looking towards a confident future. For the first time in company history, Recaro has earned more than €600 million (US\$660 million) in annual revenue by October.

C&L Aerospace partners with Electromech Technologies

C&L Aerospace has partnered with Electromech Technologies to serve as a provider for the company's product offerings including blowers, motors, valves, and actuators for many aircraft types including Beechjet, King Air, Hawker, Premier, Learjet, Beech1900,

Pilatus, and Cessna. This partnership, which includes over 70 different line items, will bring significant cost savings to operators via volume pricing to OEM quality items that are available for immediate exchange. In addition to providing the current Electromech offerings, C&L is working with Electromech to increase repair capabilities on items currently in the market to improve design, quality, and reduce lead times. These additional repair capabilities are being looked at on a per-part basis for aircraft in both the corporate and regional markets.

Bombardier to relocate its Global aircraft final assembly

Bombardier has signed a long-term lease agreement with the Greater Toronto Airports Authority (GTAA) to build its new state-of-the-art Global manufacturing center located at Toronto Pearson International Airport. With preliminary site work underway in Mississauga and first production activities set to begin in 2023, the cutting-edge facility will optimize final assembly operations for all Global business jets, including its flagship the Global 7500 business jet. The Global manufacturing center at Toronto Pearson International Airport is approximately 20 km away from the current Global aircraft final assembly site at Downsview. "Today, I'm very excited to announce the relocation of our Global aircraft family production activities to a new, cutting-edge manufacturing facility at Toronto Pearson. This is a strategic move for Bombardier and a strong commitment to Ontario's aerospace industry. It will allow us to offer world-class career opportunities and continue fueling the economic development of the region for years to come," said Alain Bellemare, President and Chief Executive Officer, Bombardier.



Photo: Bombardier Global manufacturing center at Toronto International Pearson



The first integrated 767 forward fuselage
Photo: Spirit AeroSystems

Spirit AeroSystems delivers first integrated 767 forward fuselage

Spirit AeroSystems has completed its first integrated 767 forward fuselage section for Boeing, an expanded statement of work on the Boeing platform, which serves as both a freighter and the basis for the KC-46 tanker for the U.S. Air Force. The unit is scheduled to be delivered December 4, to Boeing in Everett, Wash. Spirit has previously designed and built four separate forward fuselage end items for the 767 — the cab, lower lobe and two side panels. These were shipped by rail to Boeing for integration. With this new statement of work, Spirit will integrate the four sections into a single unit before shipping to Boeing. The 767-integration work began in October of this year in the newly opened advanced manufacturing facility on the company's Wichita, Kan., campus. The building showcases Spirit's innovative use of new technologies on production lines to improve quality and efficiency.

Dowty Propellers inaugurates new facility in Brockworth, England

Dowty Propellers has inaugurated its new facility in Brockworth, England to provide a modern operation for the company's development, manufacture and support of state-of-the-art propeller systems with all-composite blades. Located just outside Gloucester at Brockworth's Gloucester Business Park, this 183,000-ft² building brings together Dowty Propellers' primary resources on one site: from the full production process for its propeller systems to the company's administrative offices, design and engineering teams, as well as the Dowty

Propellers Repair and Overhaul (DPRO) center — the U.K. arm of Dowty Propellers' global support network. It will incorporate technologies for the high-quality production, control, repair and in-service support of the company's propeller systems, which are used on turboprop and turboshaft engines powering regional airliners and military airlifters, along with amphibious aircraft and marine hovercraft. The Brockworth facility replaces Dowty Propellers' original headquarters and blade manufacturing facility in Gloucester that was destroyed by fire in February 2015. To enable the continuation of operations, the company purchased new production equipment and created an interim blade manufacturing facility in the Gloucestershire area at Mitcheldean. This equipment is now being transferred from Mitcheldean into the new building at Brockworth, which is to become fully operational in the first half of 2020. Additionally, the U.K. DPRO center — which had previously operated

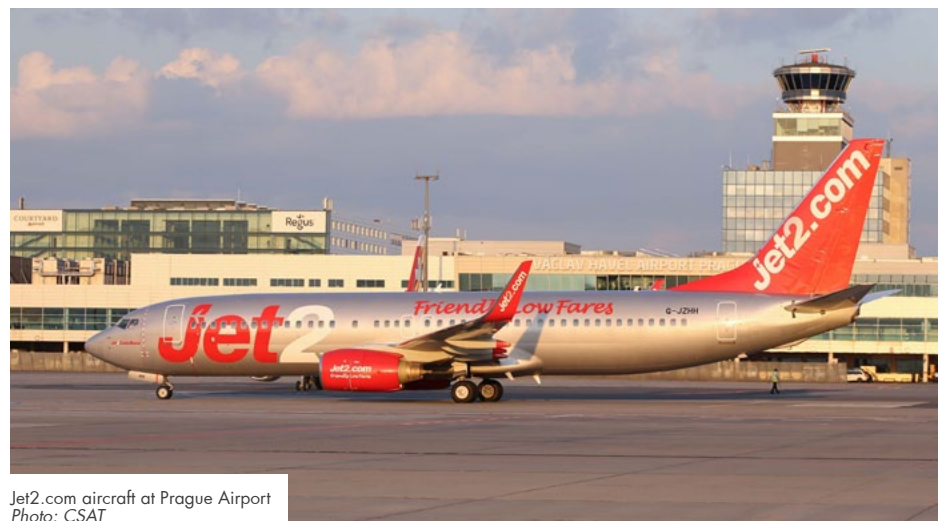
at a separate location in Gloucester — will now be integrated into the new Brockworth facility, providing additional synergy with the company's design engineers, production specialists and support teams. There also are DPRO centers in Sterling, Virginia, U.S.A., and Brisbane, Australia, as well as a team of field service engineers that are deployed around the world for field repairs.

Kellstrom Aerospace completes acquisition of Airbus A320 for tear-down

Kellstrom Aerospace has acquired an Airbus A320-232, MSN 1648, for tear-down. The 1994 A320 aircraft was acquired from Castlelake L.P. The airframe is currently undergoing disassembly at ECube's facility in Wales, U.K. This project will support Kellstrom Aerospace's unique and innovative lifecycle solutions by supporting both Kellstrom Aerospace Asset Management division with additional short-to-mid-term lease assets and the aftermarket supply business.

CSAT signs new base maintenance agreement with Jet2.com

Czech Airlines Technics (CSAT), a subsidiary company of Prague Airport and provider of aircraft, repair and maintenance services, has entered into a base maintenance agreement with leisure airline Jet2.com. Under the contract, employees of CSAT provide Boeing 737NG aircraft base maintenance checks for the U.K. carrier, in facilities at Václav Havel Airport Prague. Czech Airlines Technics has provided one base maintenance check for Jet2.com last summer and work now continues during main maintenance season.



Jet2.com aircraft at Prague Airport
Photo: CSAT



Photo: GKN Aerospace facility

GKN Aerospace officially opens wiring facility in India

GKN Aerospace will officially open its all-new facility for Electrical Wiring Interconnection Systems (EWIS) in Pune, India, on Wednesday, December 4. The site will focus on the assembly of wiring systems for commercial aircraft and aero engines like the Airbus A320neo, Boeing 737, 777X and Boeing 787. The Pune facility will operate alongside the existing joint venture for wiring systems in Bangalore, which is serving the defense market. GKN Aerospace will create 200 jobs in 2020 growing to 800 within five years. The company will recruit a significant number of female operators and engineers and will provide on-site training for employees. A team of 30 persons has been assembled to date and the company has invested US\$10 million in the site and in its state-of-the-art equipment and technologies. The expansion to Asia is an important part of GKN Aerospace's long-term growth strategy and global operating model.

ST Engineering's Aerospace arm secures 15-year engine maintenance contract from Japan Transocean Air

ST Engineering has released that its aerospace arm, has secured a 15-year engine Maintenance-By-the-Hour (MBHTM) contract from Japan Transocean Air. Under the agreement, ST Engineering will provide an integrated suite of engine MRO solutions that include off-wing maintenance support, on-wing services and technical support to the airline's Boeing 737NG fleet. These services will be provided over a period of 15 years starting from 2020 at the Group's engine MRO facilities in Singapore. Japan Transocean Air is a subsidiary of the Japan Airlines Group, which ST Engineering has been a longstanding

partner of for MRO solutions, from integrated component services for their Boeing 737-800 fleet to airframe maintenance for their Boeing 737NG fleet.

Jat Tehnika achieves EASA Part 145 approval on SSJ100 regional jet

Jat Tehnika has successfully achieved EASA Part 145 approval for various line and base maintenance activities on the Superjet 100 (SSJ100) regional jet, with the support of SuperJet International for necessary personnel training, spares and technical services. This new cooperation will enable Jat Tehnika to perform a wide range of line and base services on the SSJ100 at its own facilities in Belgrade, Nikola Tesla airport, Serbia, as well as in other selected line outstations. Mi-

roslav Musulin, CEO of Jat Tehnika, stated: "Jat Tehnika continues its strategic goal to be among the most advanced MRO key players in the market of state-of the art aircraft such as Boeing MAX, Airbus NEO and Superjet 100. Safety and environment protection are our greatest achievements and we will continue to support the similar projects with the same pace in the future."

TELAIR and HAECO enter ten-year component services partnership in the People's Republic of China and Asia Pacific

HAECO Component Overhaul (Xiamen) has been appointed as the exclusive Authorised Repair Center in the People's Republic of China and Authorised Repair Center across Asia Pacific for TELAIR International GmbH (TELAIR) under a ten-year partnership agreement. The scope of this partnership covers full repair services for all TELAIR Power Drive Unit (PDU) and Mechanical Components on Airbus A320, A330, A330neo and A350 fleets as well as Boeing 767 and 747 fleets. Under this partnership, HAECO Component Overhaul (Xiamen) will establish a new Center of Excellence with a dedicated state-of-the-art test bench designed and approved by TELAIR and run by experienced mechanics trained by TELAIR. In addition to providing airlines and customers with a full range of test, repair and modification services under its EASA, FAA and CAAC certifications, HAECO Component Overhaul (Xiamen) will also provide technical support, logistics services and OEM warranty administration support as an Authorised Repair Center.



Photo: TELAIR and HAECO contract signing



Main Oxidiser Tank
Photo: Virgin Galactic

Virgin Galactic places Main Oxidiser Tank into its next spaceship

Virgin Galactic has completed a major milestone in the build of the next spaceship in its fleet. The team has placed the Main Oxidiser Tank (MOT) into the fuselage – moving this vehicle a step closer to beginning its flight test program. The MOT forms part of the structure of the vehicle, connecting the forward and aft part of the spaceship. It also holds the oxidizer for the rocket motor which powers the spaceship to space. The Virgin Galactic rocket motor is a hybrid system which uses a solid fuel along with a liquid oxidizer and holds the record of being the most powerful hybrid rocket motor to be used in crewed flight. During a spaceflight, the oxidizer in the MOT allows the solid fuel to burn. “To ignite the rocket motor and burn the fuel an oxidizer is needed,” explains Jose Stevens, Chief Engineer, Propulsion, at The Spaceship Company. “On Earth, most fuel burns using the plentiful supply of oxygen found in the atmosphere, but at very high altitudes and in space, the lack of oxygen means we have to bring an oxidizer along with us to allow the rocket motor fuel to burn and generate the required thrust.” During the most recent Virgin Galactic spaceflight, the rocket motor burned for a duration of 60 seconds and created enough energy to propel the spaceship, VSS Unity, into space at almost three times the speed of sound.

C&L Aerospace signs supplier agreement with Thai Aviation Industries

C&L Aerospace has signed an exclusive supplier agreement with Thai Aviation Industries (TAI), Thailand’s aircraft repair and maintenance service center. This partnership will allow C&L to better support the Royal Thai Airforce’s fleet of Saab aircraft through Thai

Aviation Services. The agreement, which is for two years, is the continuation of the successful history of the two companies working closely together to provide cost-effective solutions for Saab operators. “Having this deal in place allows for fluid communication and inventory movement between both TAI and C&L,” said Jameel Wazir, C&L Executive Vice President. “Our commitment remains to be able to understand and anticipate the customer needs to provide the best possible support.”



Photo: Liebherr LAMC Aviation (Changsha) landing gear work

Liebherr LAMC Aviation (Changsha) delivers 100th ARJ 21 landing gear strut

Liebherr LAMC Aviation (Changsha), the joint venture between the Chinese company LAMC (AVIC Landing Gear Advanced Manufacturing) and German-based Liebherr-Aerospace Lindenberg, has delivered the 100th landing gear strut from Changsha for COMAC’s twin-engine ARJ21 regional jet program. Since the first delivery ceremony for the ARJ21’s landing gear struts took place in 2016, a lot has happened at Liebherr LAMC Aviation (Changsha). The successful joint venture is not only celebrating the milestone of the 100th landing gear strut delivered to COMAC, but it is also on course to ramp up production to 90 landing gears struts per year by 2020. In addition to the ARJ21 program, LLA is also home to the assembly line for COMAC’s narrow-body twinjet C919 landing gear struts. The ceremony for the first delivery of the C919 landing gear strut for flight test aircraft 104 from this facility occurred in 2018. The company is set to ramp up production to 145 landing gear struts per year by 2025, and its first delivery of two shipsets (or six struts) for series production is scheduled for the second quarter of 2020. COMAC plans to deliver the first C919 to its customer in 2021.



KLM Cityhopper
Photo: Recaro

Recaro Aircraft Seating to outfit KLM Cityhopper's 195-E2 fleet of 21 aircraft

Recaro Aircraft Seating has been selected by KLM Cityhopper, KLM's regional carrier, to outfit the 21 Embraer 195-E2 aircraft they recently ordered. Each aircraft will have a hybrid layout of Recaro BL3710 and SL3710 seats, and the first 195-E2 is slated for delivery in the first quarter of 2021. The unique cabin layout of the plane reflects Recaro and KLM's dedication to reducing the carbon footprint, as it will optimize weight efficiency while still ensuring passenger comfort. With 132 seats on board, the 195-E2 will be the largest aircraft in KLM Cityhopper's fleet and will help accommodate growth. The partnership between these aviation industry innovators will only further enhance KLM's sustainability initiative, "Fly Responsibly," and the commitment of Recaro to the research and development of more efficient seats.

AJW Group invests in Bombardier Global Express components

AJW Group has bolstered its presence in the business jet market with a major investment in Bombardier Global Express components. Available inventory includes two BR710 engines, landing gear ship set, flaps and auxiliary power units (APUs). The inventory is held at AJW Technique, the state-of-the-art facility that forms the centralized hub for the AJW Group's MRO in Montreal and available for shipment worldwide. AJW has held a contractual relationship with Bombardier since 2018, undertaking all repair management for the OEMs' rotatable inventory. The work covers Bombardier's Learjet, Challenger and Global series family of aircraft.



Photo: AJW Group invest in Global Express components

All Nippon Airways and LHT sign MoU for technical collaboration on Boeing 777-9

All Nippon Airways (ANA) and Lufthansa Technik have signed a comprehensive Memorandum of Understanding (MoU) regarding a technical



All Nippon Airways and LufthansaTechnik contract signing
Photo: LHT

collaboration project for the Boeing 777-9. The Japanese carrier is one of the launching customers for the 777-9, while Lufthansa Technik is currently preparing its maintenance, repair and overhaul (MRO)-readiness for the arrival of the first Lufthansa aircraft of this type planned for the beginning of 2021. The collaboration will contribute to the success of both companies and help to enable best-in-class dispatch reliability for ANA and for Lufthansa Technik's future customer fleet from day one of entry into service of the 777-9 aircraft. The two partners have already identified different engineering and maintenance areas in which they want to collaborate or have even started to do so. In the entry-into-service phase of the aircraft, the two companies want to share insights and best practice in engineering services and want to collaborate in aircraft production inspection. They will also cooperate in the fields of material planning and sharing, line maintenance services and aircraft-on-ground (AOG) support. Furthermore, the partners plan to develop digital maintenance predictors on the technical base of AVIATAR, Lufthansa Technik's independent digital operations suite. Further upcoming fields of collaboration will constantly be discussed between the two companies.

Novair becomes first CFM LEAP-1A Engine Services customer of Lufthansa Technik

The Swedish charter carrier Nova Airlines AB (Novair) and Lufthansa Technik have signed a long-term exclusive engine maintenance services contract, for the CFM International LEAP-1A engines of Novair's two Airbus A321neo aircraft. Thereby, Novair has become the launching airline customer of Lufthansa Technik's technical services for this new engine type. Lufthansa Technik has received the approval for this engine type by the German federal aviation administration LBA (Luftfahrtbundesamt) and is now in the position to offer comprehensive technical support for the LEAP-1A engine. Covered by the new contract are different services, including engineering, overhaul and testing, mobile engine services (MES), engine parts repair and warranty handling. Novair is the in-house airline for the Scandinavian tour operator Apollo Travel Group. Both form part of DER Touristik Nordic.



Photo: Novair LEAP-1A engine

Etihad Engineering and Satair sign supply agreement

Etihad Engineering, the commercial aircraft maintenance, repair and overhaul (MRO) services provider in the Middle East, has signed a supply agreement with Satair, one of the largest aviation spares and solution providers. The signing ceremony took place at Dubai Airshow 2019. The agreement covers supply chain solutions that will ensure worldwide availability for selected aircraft parts. While this signing marks the official agreement between Satair and Etihad Engineering, the business relationship between the two dates back more than 25 years.



Delegates from Etihad Engineering and Satair gather at Dubai Airshow after the contract signing
Photo: Etihad Engineering

MTU Maintenance signs exclusive CFM56-7B contract with Malaysia Airlines Berhad

MTU Maintenance and Malaysia Airlines Berhad have signed an exclusive ten-year contract for the airline's over-100 CFM56-7B engines. The contract covers maintenance, repair and overhaul for the engine fleet until phase-out and includes lease engines and LLP management. The service offering incorporates MTU Maintenance's PERFORMPlus solution for newer engines, ensuring longer on-wing times through optimized fleet management, engine trend monitoring, on-site services and lease support. Further, it also draws on numerous elements of the company's SAVEPlus solution for more mature engines, using smart strategies to minimize cost at end of life. MTU Maintenance Zhuhai will be carrying out these services on behalf of Malaysia Airlines. Malaysia Airlines is the national carrier of Malaysia and transports 40,000 guests on more than 300 flights daily to 59 destinations around the world.



Malaysia Airlines Berhad and MTU Maintenance signing ceremony
Photo: MTU



Embraer Praetor 600
Photo: West Star Aviation

West Star Aviation completes custom paint job on first Embraer Praetor 600

West Star Aviation (West Star) has completed a custom paint finish on a new, factory-delivered Embraer Praetor 600, a first for the company. The new aircraft was brought to West Star directly from the Embraer factory at the request of the customer for a unique and custom paint job. With its state-of-the-art paint facility, West Star is capable of handling large and small paint projects, as well as being a one-stop shop for our customers and their requests.

Finance News

Monocle Acquisition and AerSale announce merger agreement

Monocle Acquisition, a public investment vehicle, and AerSale®, a leading integrated, global provider of aviation aftermarket products and services, have entered into a definitive agreement to merge in a transaction with an implied enterprise value of approximately US\$430 million, equating to approximately 6.3x AerSale's forecasted 2020 Adjusted EBITDA. The combined company, which will be named AerSale Corporation, will be publicly traded on the Nasdaq Stock Market. AerSale, currently owned by Leonard Green & Partners, Florida Growth Fund LLC and the Company's two founders, is a leading global supplier of aftermarket aircraft, spare engines, flight equipment, maintenance, repair and overhaul (MRO) services, and used serviceable material (USM) support. The Company also provides a broad range of internally engineered proprietary repairs, products, modifications, upgrades, and other cost-saving technical solutions. Under the terms of the merger agreement, which was unanimously approved by the boards of directors of both Monocle and AerSale, existing AerSale shareholders, including Leonard Green & Partners, will receive US\$250 million in cash and US\$150 million in newly issued common equity at closing, subject to adjustment to the mix of consideration under certain circumstances.

Apollo and Athene close acquisition of GE Capital's PK AirFinance debt business

Apollo Global Management, Athene Holding and GE Capital, the financial services arm of GE have closed their previously announced transaction for Apollo and Athene to purchase PK AirFinance, an aviation lending business, from GECAS, GE Capital's Aviation Services unit. In connection with this transaction, Apollo has acquired the PK AirFinance aircraft lending platform and Athene has acquired PK AirFinance's existing port-

folio of loans. PK AirFinance is a leading aircraft lending business that serves airlines, aircraft traders, lessors, investors and financial institutions globally with loans to borrowers in more than 40 countries. Substantially all of the US\$3.6 billion of PK AirFinance financing receivables that were held for sale in the second quarter of 2019 are being sold in the transaction, at a premium-to-book value. Financial details of the transaction are not being disclosed, although the close represents receipt by GE of more than 90% of agreed proceeds. The transfer of the remaining portion of the business is deferred pending certain regulatory and other conditions and is expected to be completed in the first half of 2020.

Airbus acquires industrial automation company, MTM Robotics

Airbus has acquired industrial automation company, MTM Robotics, for an undisclosed sum. The move deepens Airbus' commitment to expanding advanced robotics capabilities within its manufacturing processes. The MTM business will retain its current leadership and 40-person staff, as well as its facility in Mukilteo, Washington, near Seattle. The acquisition is the latest chapter in a trusted, ten-year-plus relationship between the companies, with multiple MTM light automated robotics systems currently in use at Airbus manufacturing facilities. While MTM will operate as a wholly owned subsidiary of Airbus Americas, Inc., headquartered in Herndon, Virginia, it will continue to serve other customers in the aerospace industry. Since 2003, MTM has deployed more than 40 aerospace manufacturing systems comprised of machines, tools, machine software, enterprise software and support throughout the United States, Europe, the Middle East and Asia. The acquisition marks the latest step for Airbus in its industrialization roadmap, aimed at leveraging the time- and cost-saving benefits associated with using robotics in the manufacture and assembly of its commercial aircraft.

Air Lease Corporation announces pricing of offering of CA\$400 million of senior unsecured medium-term notes

Air Lease Corporation has CA\$400 million, or US\$301 million (based on a Canadian dollar/U.S. dollar exchange rate of C\$1.00=U.S.\$0.7523, as announced by the U.S. Federal Reserve Board as of November 22, 2019), aggregate principal amount of 2.625% senior unsecured medium-term notes due December 5, 2024 (the Notes). The sale of the Notes is expected to close on December 5, 2019, subject to satisfaction of cus-

tomary closing conditions. The Notes will mature on December 5, 2024 and will bear interest at a rate of 2.625% per annum, payable semi-annually in arrears on June 5 and December 5 of each year, commencing on June 5, 2020. Owners of the Notes will receive payments relating to their Notes in Canadian dollars. The company intends to use the net proceeds of the offering for general corporate purposes, which may include, among other things, the purchase of commercial aircraft and the repayment of existing indebtedness.

Information Technology



S7 Technics has successfully implemented AMOS' MRO Edition software
Photo: S7 Technics

Aircraft maintenance, repair and overhaul (MRO) services provider **S7 Technics** has completed the implementation of **AMOS MRO Edition**, the innovative software application developed by **Swiss Aviation Software** (Swiss-AS). S7 Technics has thus become one of the first maintenance service providers to successfully implement AMOS MRO Edition as a primary information system for the continued airworthiness and MRO of aircraft operated by both Russian and foreign customers. In the short-term, S7 Technics is planning to start managing its hangar capabilities using AMOS MRO Edition, and the introduction of the software's mobile edition, AMOS Mobile, is scheduled for 2020.

Aircamo Aviation (Aircamo) has selected **OASES** to support its established CAMO and technical management operations. Aircamo is an aircraft asset management and airworthiness company, providing transition and heavy maintenance support to airlines, leasing companies and operators worldwide. Based out of Manchester Airport Business Park (U.K.), the company specializes in Private/Commercial Aircraft and Engine Technical and

CAMO Management advisory services. Aircamo's technical approvals include: EASA Part M – UK.MG.0697, Guernsey 2-REG.39.34, Bermuda BDA/CAMO/166, and Cayman Islands 081-CAY-CAMO-2019. The Aircamo team consists of very experienced senior technical managers, many of whom previously worked with a variety of large airlines, MRO's and leasing companies. Aircamo has

chosen the Core, Airworthiness and Planning OASES modules, which will be implemented in Commssoft's Private Cloud. Discussions are well underway between Commssoft and the Aircamo-team, where data migration consultancy and support will be key components of the project plan. Due to uncertainty within the market, Aircamo is providing "Shadow CAMO" services for several lessors who want to react quickly in the event of a default or collapse.

South Korean start-up, **Aero K Airlines**, has signed up for **Rusada's** MRO and Flight Operations software, ENVISION. Aero K is scheduled to commence passenger flights as of March 2020 serving destinations across Asia, including China, Japan and Vietnam. Aero K will use ENVISION to manage the airworthiness of its fleet and line maintenance activities as well as its human resources, finance and accounting and more, adopting seven modules in total. Rusada will begin the implementation project immediately so that everything is in place for Aero K's launch next year.



South Korean start-up, Aero K Airlines, opts for Rusada's ENVISION software
Photo: Rusada

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A growth momentum

MRO activities were worth around \$82 billion in 2019.
Photo: S7 Technics

Incoming technologies, consolidation in the industry and the changing composition of the global fleet have driven growth in the MRO sector. **AviTrader MRO** looks back at the trends that shaped the past year.

The commercial air transport MRO market has been valued at around \$82 billion in 2019, according to a report by experts at Oliver Wyman. With an exceedingly healthy MRO market in 2019, Brian Sartain, AAR's SVP of Repair and Engineering saw a significant trend in consolidation amongst OEMs, as well as MRO capacity being added - "Airbus and Boeing have continued their push for greater participation and control of the MRO aftermarket."

Certainly, the aviation industry's emphasis on data analytics and digital capabilities has increased over the last 12 months. Sartain says AAR has stayed ahead of the trend in developing several digital platforms tailored to customers and business, as well as investing in digital innovations to increase efficiency, reduce costs and capture as much data as possible within the MRO space.

"Our data generation and capabilities enable us to provide our customers with optimal quality assurance, repair tracking, and inventory demand forecasting — plus return their aircraft to service faster. In that vein, we just launched the pilot phase of our new drone programme."



Brian Sartain, AAR's SVP of Repair & Engineering

Over the next year, AAR will be testing drone technology at their MRO hangar in Miami for aircraft inspections, which Sartain predicts will cut inspection time significantly and deliver crucial data capabilities. AAR's cloud-based, streamlined component repair management system, Airvolution®, has already been

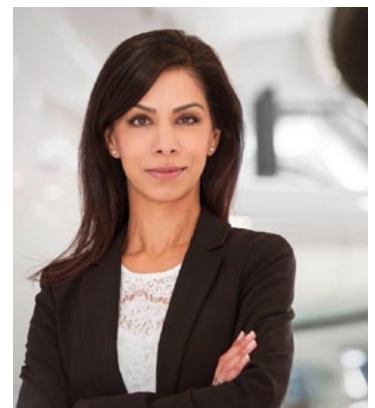
integrated by a key global airline this past year. Also, AAR's PAART-STM Store, with over 1 million parts available online for customers to purchase and ship instantly, continues to break revenue records every month, Sartain reports - "The aviation industry's demand and shift toward digitisation is only moving forward in the new year."

Another noticeable trend is the rapid expansion and growth across China and the wider Asia Pacific region with several airports being built and increasing passenger numbers making the market extremely lucrative reckons Sajedah Rustom, CEO AJW Technique.

Further, Sajedah states the gradual maturing of China's relatively young aircraft fleet has boosted demand for rotatable components. "A knock-on effect of this is the increased demand for skilled MRO talent in the Asian region. We have already started to see an increase in highly-skilled engineering professionals coming through and this will only increase as the Asian market is forecast to be home to 40% of the global aircraft fleet by 2027."

Having predicted this rapid growth, AJW has held a presence in the Asian market for over 20 years and it is very much a core part of the strategy for the future.

A notable change in the industry has been airframe OEMs' expansion into the aftermarket, Sajedah also observes. Airlines and aircraft manufacturers often desire a nose-to-tail aftermarket solution that



Sajedah Rustom, CEO AJW Technique



CFM56 MRO taking place at Standard Aero.

delivers benefits that stretch far beyond keeping up with day-to-day maintenance requirements. "AJW offers airlines a complimentary mix between the airline, OEMs and third-party MRO partnerships. By using AJW as an integrator, airlines can greatly streamline their maintenance requirements."

AJW benefits from these partnerships too, especially the technical, reliability and Service Bulletin/Airworthiness Directive support that a component OEM can provide – "So rather than taking a competitive approach, teaming with OEMs enables aftermarket providers, like AJW, to build highly effective agreements that deliver the streamlined and cost-effective solutions that the airlines want and need."

In 2019, Liebherr-Aerospace benefited from a solid activity in MRO, led by rewarding landing gear overhaul campaigns in Europe, America, Asia and Africa. Another key



Joel Cadaux, Director Business and Services – Customer Services, Liebherr-Aerospace and Transportation SAS

fact has been the expansion of the Liebherr-Aerospace heat exchanger cleaning network, with the qualification of selected partners. Joel Cadaux, Director Business and Services – Customer Services, Liebherr-Aerospace and Transportation SAS says: "The dedicated organisation that we put in place has been a success: we were able to celebrate the maintenance of the 5000th heat exchanger in our US-American repair station in Saline, Michigan."

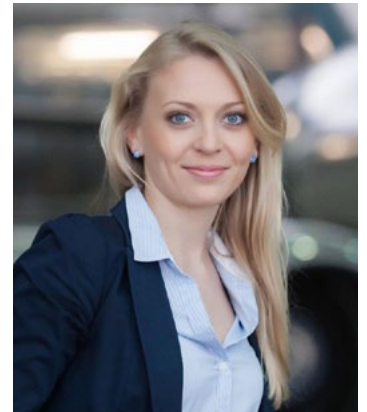
Cadaux echoes other observations on the rising positioning of the aircraft OEMs on the aftermarket – "Major OEMs are developing their MRO services, on their own platforms as well as ones abroad, and they are launching new activities such as USM (Used Serviceable Materials). This verticalization of the air framers aims at an increased involvement in the supply chain to better control their costs."

Meanwhile, Cadaux says some Tier1 suppliers tend to consolidate through mergers and acquisitions in order to create major groups that can manage nose-to-tail aftermarket. "Liebherr-Aerospace prefers to concentrate on its core expertise in order to offer a complete range of services around its own products. This unique strategy leads to high-level quality, on-time performance and control of its costs."

Inga Douglas, Commercial Director at Magnetic MRO says another trend observed is that operators

are shifting towards long-term airframe maintenance contracts. "This trend is influenced by many factors in the aviation market, as well as growth of the fleet of narrowbody aircraft in general, also an increase of natural maintenance demand for the ageing fleet of narrowbodies.

"The shift in European market with classics going away and new aircraft types coming can both be seen as a disruption and as an opportunity for MROs in the region," comments Douglas.



Inga Douglas, Commercial Director at Magnetic MRO



Roger Ross, President – Airlines and Fleets for StandardAero

The underlying trend of the growth of the MRO market – primarily reflecting the continued growth in commercial airline revenue passenger miles – should not be overlooked, Roger Ross, President - Airlines and Fleets for StandardAero points out.

While business economists have expressed concern over the potential for a recession in 2020 or 2021, for now demand in our sector remains strong, as reflected by the volume of engine inductions in 2019, Ross states. “While the industry does continue to experience some material supply issues, caused by the strong MRO cycle having coincided with the ramp-up in production of new generation engines, this has not prevented us from achieving another year of strong sales and output growth in 2019.”

The second obvious trend Ross mentions is that of consolidation, both horizontal and vertical. “The MRO industry is still seen as being an attractive space for investment, as witnessed by The Carlyle Group’s acquisition of StandardAero earlier this year. MRO companies continue to command strong prices, reportedly averaging 11x EBITDA over the past two years, encouraged both by the strong revenue growth in our industry as well as by the robust order backlogs currently reported by the major aircraft and engine OEMs.”

A third and widely discussed trend is that of labour shortage concerns - “While we have not yet seen the same supply-demand dynamics as witnessed in the pilot labour force, where salaries have increased dramatically in recent years, the availability of trained technicians certainly is a longer-term concern for the industry. Fortunately, we are able to proactively address this concern, both by partnering with local colleges to foster and train the next generation of technicians, as well as by ensuring that StandardAero remains a place where skilled mechanics want to come to work,” Ross highlights.

The growth and changing composition of the global fleet certainly has an impact on the MRO business. “It will definitely require MROs to adjust, invest into developments and trainings to continue serve the needs of customers,” Douglas from Magnetic MRO mentions. “New engine types in the market changes the engine line service as well – the ability to react and service such engines promptly especially on the wings are becoming increasingly important and will be a core service in the future.”



James Bennett, Director Sales and Marketing, AerFin

Firstly, Ross from StandardAero says it’s worth remembering that the impact of new generation aircraft will take time to be fully felt, both due to the long timescales associated with the replacement of the current fleet of 26,000+ airliners, as well as due to the subsequent delay that will occur until these new generation aircraft begin to generate significant MRO demand. Many of the existing aircraft will continue service in new locations as the world industrialises.



The availability of trained technicians certainly is a longer-term concern. Photo: StandardAero

“One clear hope of operators is that new generation aircraft and engines will continue to push the ‘time on wing’ at the same time as the new engine models are industrialised,” he states.

The use of new materials and technologies will obviously require MRO providers to update their shop capabilities in turn, and the ever-greater reliance on engine health monitoring – for example through real-time prognostics – will also have an impact. “Such technology will likely favour those MRO providers who are able to support operators with analytical capabilities, as well potentially increasing the importance of ‘on-wing’ support services as TBOs lengthen. High capability service providers, such as StandardAero, will become even more relevant as the advanced technology of new engines requires close partnerships with OEMs as well as sophisticated technical, repair and operational capabilities.”

The impact of electric aircraft on the MRO industry remains to be seen, Ross continues, just as it does on the broader market itself. “While electric propulsion does appear to have good near-term potential as a solution for shorter-range vehicles – most notably those serving the urban air mobility segment – the question of exactly how big a disruptor such technology will represent in the long haul marketplace has yet to be established.”

For engines - James Bennett, Director – Sales and Marketing at AerFin expects to see very limited impact in 2020 or even in the short-term. Especially, given that the CF34-8 and CFM56-5B/7B engines have yet to see their first major maintenance event which isn’t predicted peak until 2023.



Grounding of the 737 MAX will have knock-on effects.
Photo: Boeing

Katia Diebold-Widmer, Head of Marketing, MTU Maintenance comments that demand is very high for engine MRO and most shops are running at maximum capacity, so it is a very positive environment for MROs. "At the same time the current situation comes with many challenges, both for MROs and suppliers. MRO slot capacity is currently very tight worldwide as a result of various market forces."

Shop visits will peak for the newer versions of V2500 and CFM56 engine families – the V2500-A5, CFM56-5B and CFM56-7 – by mid next decade, Diebold-Widmer suggests. "Demand for services for older legacy engines, such as the CF6-80C2, has continued longer than expected – thanks to low fuel prices and high demand for air transport, as well as a continued boom in e-commerce. Also, new generation engines are entering the shops earlier than originally anticipated and will ramp up in the next decades. All this has led to our shops being fully loaded worldwide."

Diebold-Widmer feels there are two large challenges currently: managing slot availability and material supply. She says this is due to the enormous growth that the aviation and MRO industries have seen. "Engine shops in general are full and early planning and foresight is imperative on the part of operators and providers. This is something that has been a key issue in recent years, and we are working intensively with our customers to make sure they get the services they need within the timeframe desired. Furthermore, we are increasing capacity at all facilities worldwide to meet this growth and our customer's needs and performing work on-site or near-wing wherever possible."



Katia Diebold-Widmer, Head of Marketing,
MTU Maintenance

Diebold-Widmer warns that the availability of spare parts is a concern and puts high pressure on the total supply chain. "Delays in that area can lead to engine turn time increases. In turn, this can lead to a higher level of spares demand and a higher pricing for those spares. "Luckily, our leasing arm, MTU Maintenance Lease Services B.V., also can support our customers with immediate solutions, such as short-term leasing or engine exchange, if required."

The MAX factor

No doubt the Boeing 737 MAX fiasco is the biggest and most significant event in 2019 - when the type inevitably returns to service, expected in 2020 [supposedly] , there may be the start of a new wave of Next Generation (NG) returns that have the potential to disrupt that market – believes Cliff Topham, Sr VP Sales at Business Development at Werner Aero Services.

Ross agrees that the grounding of the 737 MAX fleet was certainly one major disruptor. "While the return to service of the fleet does now appear to be nearing, the grounding had a direct impact on the industry during 2019 as airlines moved to compensate the lost seat capacity through the use of older generation jets."

He says this in turn had several knock-on effects, most directly in terms of short-term demand for spare engines, but also in terms of MRO: "some planned engine events were delayed as operators sought to extract the maximum possible life from their assets, while other customers sought immediate MRO solutions in anticipation that the grounding would require a rethink of their aircraft's expected economic life," states Ross.

Sartain from AAR admits that the circumstances of the 737 MAX have created uncertainty in many of their customers' fleet plans, and many reintroduced older 737 aircraft into their fleets. "With our strong legacy platform expertise, we were able to adjust quickly and modify our schedules to meet all of the MRO needs and timing of our airline partners."

Bennett from AerFin also sees ongoing MRO capacity constraints exacerbated by the 737 MAX grounding. "This is resulting in continued unscheduled shop visits which as a result, are putting pressure on the MRO providers."

As a final note Ross from StandardAero sums up on Brexit - "In Europe, the impact of Brexit will be closely watched. While the CAA [UK] itself has undertaken significant planning for the UK's exit from the EU, only time will tell how smoothly the departure will be for local operators. We of course hope that the CAA's long-standing close coordination with EASA and other European airworthiness authorities will stand it in good stead, but Brexit represents uncharted waters for the industry in many ways."

Setna iO: Global component support



Setna iO employees
All photos: Setna iO

Setna iO was formed in Chicago, IL in 2016 by President David Chaimovitz, Managing Partner Robert James, and Partner Jason Kozin. Through previous industry experience, the group recognised the opportunity for a nimble, aggressive, and well capitalised company to quickly grow into a major player in the commercial airframe component business.

Setna iO is a data driven trading company with a foundation built on customer service. Understanding what components are required by today's global fleet is the most important piece of their business, and a knowledge of what airlines require prior to the RFQ process is critical to the success of their model. With strong capitalisation, Setna iO has had the ability to do major, pro-active, inventory acquisitions from day one.

Technology has been a key ingredient in the recipe. The team has developed proprietary software using millions of data points to analyse the supply, demand and pricing of various components in an easy to digest, visually appealing dashboard.



Setna iO's operational thesis is to have the data, delivery prowess, financial backing, and deal-making ability to stock all parts in airworthy condition to support the current global fleet. This model has propelled Setna iO from approximately \$2,500,000 of revenue in 2016 to \$40,000,000 of revenue in 2019.

Although it is impossible to stock everything, this method of thinking- carried out by an exceptional team- has proven very successful. Personnel have expertise in specific platforms, and APU's have been a strong suit since inception. Setna iO has transacted in the purchase, sale, lease, and teardown of over 80 APU's. Airframes supported include B737, B737NG, B747, B757, B767, B777, A320 family, A330, A340, E190, CRJ700, Q400, and ATR72. The group supports almost all ATA chapters, with specialties in 49(APU) & 32(Wheels/Brakes).



Soon after its inception, Setna iO expanded with a trading team and warehousing operation in London. This has allowed for the company to truly support a global customer base 24 hours a day, 7 days a week. Team members are encouraged to make decisions and take educated risks based on data, and this push for horizontal decision making has propelled the company's growth. The company believes this is what has taken them from a startup in 2016 to a mid-sized player today; and will turn them into an industry leader in the coming decade.

Setna iO currently has team members in Chicago, Arizona, Nevada, London, and France, and there are plans to expand warehousing and office space in 2020 to support the continued growth. The market has proven ripe for a company whose mission is build their airworthy inventory at a rapid pace. 2020 is forecasted to be a record-breaking year for Setna iO with further expansion into European and South American markets and the increased expansion of rotatable and expendable components, as well as an increased amount of airworthy APU's.



Air Canada A220 in paint shop.
Photo: Airbus

Aerospace OEMs and MROs: Does your coating thickness meet Spec?

Instantaneous handheld coating thickness gauges that can be operated by virtually any technician deliver lab-quality readings even on curved and complex surfaces.

From the aerospace OEM assembly line and spray booth to soaring mission critical maneuvers and the maintenance, repair and overhaul (MRO) hangar, it is vital that leading edge aircraft be made to spec and precisely coated for reliable performance, protection, and prolonged life.

So, the aerospace industry needs accurate coating thickness measurement whenever plating, anodizing, powder coating or other coatings are required. This is particularly important when the coatings play a critical role in preventing the corrosion or wear of metal substrates.

Properly applied coatings, with thickness measured in mils (.001 inch) or microns (.001 mm) are crucial to avoid coating breaches leading to corrosion of the underlying substrate. Precise application to spec, along with coating measurement, can also help to prevent leaks and other safety issues.

However, until recently conducting frequent laboratory-quality coating thickness tests throughout the manufacturing process or in the field has been difficult. Traditionally, this required meticulous sampling and preparation, as well as taking the sample to the lab for evaluation. Although portable coating thickness gauges are not new, most fail to provide the accuracy, speed, or simplicity required for anyone to conduct quick checks as needed on the production line or in the field.

Fortunately, handheld devices are now available that allow personnel to easily and quickly perform lab-quality coating thickness measurements. Some options offer instant coating thickness measurement of almost any non-magnetic coating on both ferrous (magnetic) and non-ferrous (non-magnetic) substrates. This is possible using only one hand, even on curved and complex surfaces.

By simplifying the process, aerospace OEMs and MROs can increase the quality of their products and services from start to finish while optimizing cost.

The Many Benefits of Coating Thickness Readings

Coating thickness directly affects aircraft and component quality, whether for paint, electroplating, anodizing, or a wide range of other

coating applications. For example, checking the paint coating consistency on an aircraft or component not only provides a superior finish, but can also offer essential data about paint consistency when it is wet.

"Incorrect paint consistency can affect drying times or eventual flaking of the paint film," says John Bogart, Managing Director of Kett US, a manufacturer of a full range of coating thickness testers. "Too little paint coating and you are left with cosmetic issues in opacity, and protective issues like corrosion, wear, and exposure."

When specificity and adhesion matter in anodizing and electroplating, a coating thickness gauge should be able to read the thickness of the coating to the most minute measurement. This can play a major factor in preventing corrosion while optimizing the process by eliminating any excess use of the expensive plating product.

Another way a coating thickness gauge can make a significant impact is in testing anti-corrosion coatings in pipe or piping to find weak spots, where the coating is too thin and a breach of the coating could make the substrate susceptible to corrosion, according to Bogart.

"Knowing about these trouble spots can prevent a problem well before it occurs," he says. "This could involve aircraft engine piping and tubing or exhaust pipes."

"A nondestructive gauge is a perfect way to ensure that the protective coating has not been applied too thinly or become so over time," he adds. "Excessively thin coatings are more likely to be chipped or breached, which can lead to corrosion promoters like water or oxygen getting under the coating and accelerating corrosion in the substrate."

Simplifying Coating Thickness Measurement

Although traditional laboratory and online based coating thickness measurement techniques are useful in the right settings, they have lacked the simplicity and flexibility required for frequent spot checks. Often, this involves sampling, sample preparation,

and taking the sample to the lab for evaluation, which requires the participation of staff adequately trained for the process.



A380 painted for ANA.
Photo: ANA

Other conventional coating tests, such as scratch testing, have been destructive or invasive and damaged the sample. This meant that a product could not be returned to the production line, or that a coated surface had to be recoated or repaired in the field at additional expense. Also, since only a small portion of the component may be tested, results may not be representative of the entire situation.

Consequently, various portable coating thickness measurement devices have been developed. However, these have not always provided the necessary accuracy or been sufficiently easy to use.

Another drawback is that in certain environments with multiple substrates, the devices typically either had difficulty determining the substrate or utilizing the correct test for the application. So, multiple measurement devices had to be used, which complicated testing and added cost.

Finally, typical coating measurement methods were usually unable to accurately measure curved or complex surfaces. This left pipe, piping, and convoluted component designs largely unable to be easily spot checked for coating compliance.

In response, aerospace industry innovators have developed several advanced designs for handheld coating thickness test devices. For units used on the production line and in the field, these significantly improve accuracy, versatility, and ease of use.

One example, the LZ990 portable coating thickness gauge by Kett combines two of the most widely used measurement methods, magnetic inductance and eddy current, in a dual mode device that can measure the coating thickness of almost any non-magnetic coating on both ferrous (magnetic) and non-ferrous (non-magnetic) substrates.

Since the unit can automatically determine the substrate and use the appropriate measurement circuit, this enables instant, non-destructive

testing on painting, plating, anodizing, and organic coatings with accuracy up to 0.1 μm . Such testing takes less than a second to display the measurement.

Because the key to providing accurate, repeatable measurements is the operator's ability to reliably make consistent contact between the instrument and the test surface, the unit also utilizes a spring-loaded probe to generate a consistent contact pressure with the measured surface. This integrated probe also includes built in edge guides to enable easy measurement of even curved and edged surfaces. To ensure device stability during measurement, the foot of the probe is also designed to provide a firm platform when placed onto the test piece.

According to Bogart, several other design considerations in handheld coating thickness gauges can also simplify measurement and improve versatility.

In order to improve accuracy and durability on the aerospace factory floor or in the field, it is best for the unit to have no moving parts, other than the probe. Similarly, the unit should be impervious to vibration, with measurement independent of its orientation.

To save time during the testing process, he recommends utilizing a unit with a large screen that enables the quick reading of results. Those results should be able to be stored in the gauge and transferred to a computer and/or printer for documentation and averaging purposes. An instrument that stores many test measurements is best so operators can perform numerous tests before downloading the results.

"Easier, more accurate aerospace coating and plating measurement with handheld units will help to improve quality checks wherever needed," concludes Bogart. "So, defects can be immediately detected, and corrective action undertaken to minimize scrap and faulty components or aircraft."



Neil Watkins

Trenchard Aviation Group, a well-known partner in aircraft cabin component design, manufacture, repair and on-wing maintenance, has appointed **Neil Watkins** to Group Sales & Marketing Director.

The primary focus of his new role will be the development of a single sales strategy for the entire Group – comprising Aero Technics, Airbase, Servcorp, and Reheat International – and the growth of both revenue and margins. Watkins will continue to hold his current responsibilities for the oversight of Reheat International, part of the Trenchard Aviation Group and a leading provider of galley, lavatory, cabin and cockpit security equipment, maintenance and repair.

In order to support its newly-created Communications & Corporate Affairs function, which will go live on January 1, 2020, Airbus has

appointed a new Communications leadership team which will work together to bring the next chapter of the company to life, while ensuring business proximity, reinforcing audience centricity and growing digital, editorial and visual content capabilities. **Maggie Bergsma**, currently head of Communications for ATR, is appointed Head of Communications Commercial Aircraft. In the new Communications leadership team, she will join **Yves Barillé**, Head of Communications Helicopters, and **Dirk Erat**, Head of Communications Defence & Space. **Philipp Encz** is appointed Head of Creative Core, a newly created role in which he will lead Airbus’ creative content teams and oversee group-wide internal and external communication activities. Encz joins from Siemens where he acted as Head of Financial and Corporate Media Relations. He will work closely with Bergsma, Barillé and Erat to ensure proximity and coordination with the company’s three main businesses. Meanwhile, Guillaume Steuer is appointed Head of External Communications, reporting to Philipp Encz

and managing Airbus’ media relations, web and social media activities.



Miguel A. Delgado

C&L Aerospace has named **Miguel A. Delgado** as its Regional Sales Manager responsible for Latin America and the Caribbean. Delgado has over 30 years of Latin American aviation parts sales experience and expertise in creating innovative solutions for customers. He will further develop C&L’s relationships with Latin American regional airlines, specializing in ATR, ERJ, Beech 1900, and Saab 340 aircraft, along with military operators utilizing T700 and CT7 engine platforms. Delgado was previously Americas Sales Director with Acumen Aviation. He will utilize his wealth of aviation experience and knowledge to support customers with the aircraft parts and programs that support their needs. Delgado is based out of Miami, Florida.



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