APU maintenance and repair

Company Profile
Revima APU

MRO News
from around the world

People on the Move
latest appointments

IBA Analysis
Customer loyalty pays off

An interesting piece of news to come out of the wires recently is from Elliott Aviation, a diversified aviation services company based in the United States. The company announced the launch of a loyalty scheme for their maintenance business to celebrate their 80 years in business.

In essence, the programme applies a two percent credit to a future scheduled maintenance event and is accrued with any in-house work excluding engines. Elliott Aviation’s maintenance loyalty rewards programme will issue credits to customers throughout 2016 and be good for one year from the issue date.

It’s certainly indicates how competitive the MRO sector has become. Ultimately this means those with initiative and foresight will stay ahead of the game and capitalise on growth and opportunity.

In this edition we highlight a number of MROs keeping a step ahead. Lufthansa Technik and AFI KLM E&M get to grips with APU maintenance speaking about the opportunities presented by new APU technologies but also concerns with Intellectual property and licensing issues.

There is also a growing call by aircraft operators for MROs to utilise lean methods with the goal to improve efficiency and, in particular, to shorten turnaround times.

Also in this edition, we welcome back aviation experts from IBA who have provided a detailed analysis of what the MRO sector in Iran might look like in the years to come following the partial lifting of sanction there.

I hope you enjoy the read.

Keith Mwanalushi
Editor
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**Ameco secures engine contract from Ethiopian Airlines**

Ameco and Ethiopian Airlines have signed a contract for engine services. According to the three-year contract, Ameco will provide engine repair and overhaul services on PW4000s that powering the African carrier’s Boeing 767 fleet. Currently, the first engine is under repair in the workshop of Ameco’s Beijing base. Ameco and Ethiopian Airlines started cooperation in 2009. Since then, Ameco has been providing Ethiopian Airlines with RB211 overhaul services. Africa is one of the important MRO markets for Ameco. Besides engine services, Ameco also offers its customers line maintenance and airframe and component services.

**SR Technics to cooperate with S7 ENGINEERING on engine maintenance and on-wing services in Russia**

SR Technics, one of the world’s leading providers of technical solutions to airlines, is proud to announce a cooperation with S7 ENGINEERING (S7E), a part of ENGINEERING Holding, to provide Russian and CIS aircraft operators and owners with engine maintenance and on-wing services for CFM56-5B and CFM56-7B engines. The two companies signed a long-term agreement to combine SR Technics technical expertise on MRO services with ENGINEERING Holding’s deep understanding of the needs of local customers. Furthermore, SR Technics will introduce and train the local teams in the LEAN and Continuous Improvement Culture, providing the highest-quality and safety standards for the benefit of customers. Engine MRO services will be provided in a new S7E repair facility located in Domodedovo Airport (DME), Moscow, which will commence operations in early summer 2016. SR Technics will support the certification of the engine repair facility in accordance with the Russian Ministry of Transport and EASA guidelines by implementing SR Technics’ quality standards and best practices.

**UTC Aerospace Systems to supply three additional systems for Boeing’s 777X**

Boeing has selected UTC Aerospace Systems for three additional systems on the new Boeing 777X large, twin-engine jet. These are in addition to numerous systems on the aircraft awarded to UTC Aerospace Systems in 2015. UTC Aerospace Systems will now also provide the horizontal stabilizer trim actuator that moves the horizontal stabilizer to trim and stabilize the aircraft in the pitch axis during flight. This flight-critical component, part of the 777X flight control system, is being developed by UTC Aerospace Systems’ Ratier-Figeac subsidiary and is an advanced design from field-proven technology. Additionally, UTC Aerospace Systems has been selected to provide the ground maneuvering camera system (GMCS) and proximity sensor data concentrators (PSDC) for the 777X. The GMCS enhances situational awareness by providing pilots video and camera views of the nose gear, main gear and wingtip areas to aid in taxiway maneuvering. The system also offers a unique passenger experience by providing a wingtip to wingtip view from the aircraft’s vertical stabilizer through in-flight entertainment (IFE) video. The system includes high definition digital video cameras as well as a taxi camera interface unit. Designed to reduce the risk of parts obsolescence, the system can be configured for specific customer requirements.

**Aviinteriors wins bid for Rossiya Airlines A319-A320 retrofit program**

Rossiya Airlines has selected Aviinteriors for the provisioning of the Business Class “Andromeda” seat model for its 10 x A319-A320 retrofit program. The delivery of the first 10 shipsets will start from September 2016. Further additional aircraft are under discussion. Rossiya Airlines is a Russian airline headquartered in St. Petersburg with its hub at Pulkovo Airport. It has a lead role on the Moscow – St. Petersburg route, serves a number of European destinations, and additionally operates the aircraft fleet for the Government of Russia. The “Andromeda” seat model remains a leading product of Aviinteriors. The seat offers high levels of comfort and reliability in medium-to-long range aircraft.

**Privilege Style awards seven-year power-by-the-hour contract for two B757s to AJW Aviation**

AJW Aviation, the integrated aircraft support specialist, has signed a seven-year PBH contract with Spanish non-scheduled airline, Privilege Style. The contract will cover the supply of spare parts for the airline’s fleet of two Boeing 757 aircraft. Privilege Style is the first private flight operator in Spain to offer exclusive flights with medium capacity (200 seater aircraft). This new power-by-the-hour support agreement supplements AJW’s current provision for the airline’s B767-300 aircraft and provides the same full ATA Chapter coverage.

**Sprint Air signs 10-year contract with Rotable Repairs**

Warsaw-based Airline Sprint Air has signed a 10-year component maintenance agreement with Rotable Repairs and wheel and brake manufacturer Safran Messier-Bugatti-Dowty to support their increasing fleet of ATR 72’s. Messier-Bugatti-Dowty is a world leader in carbon brakes.
for commercial airplanes, with a 51% market share in this sector. As an OEM providing technical support for some 25,000 aircraft worldwide, Messier-Bugatti-Dowty calls on a complete range of maintenance repair and overhaul (MRO) solutions to support fleets of all types of aircraft, whether new or already in service. Sprint Air has been rendering specialist air transport services for nearly 13 years. Their main areas of our business include air cargo services, scheduled passenger carriage, air charters operations and aircraft maintenance, as well as the training of pilots and aviation security officers.

Clean Sky – MTU Aero Engines and partners develop new propulsion technologies

Clean Sky is the largest aviation technology research initiative ever launched by the European Commission where over 600 partners have joined forces to develop new technologies to further improve the environmental compatibility of aviation in the future. MTU Aero Engines also has a role in the project. “Our work doesn’t stop at developing new technologies for our high-pressure compressor and low-pressure turbine modules; we also qualify new partners for the European aerospace industry,” explains Dr. Rainer Martens, Chief Operating Officer at MTU Aero Engines. Clean Sky aims at strengthening the European aviation industry and enhancing its international competitiveness. The two central tasks in pursuit of this objective are to develop advanced aircraft and engine technologies, and to qualify and integrate new partners from research and industry. In the industrial sector, the focus is on small and medium-sized enterprises. MTU is doing a great job on both fronts. New, innovative propulsion system technologies were developed and integrated into a demonstrator: MTU is responsible for SAGE 4 (Sustainable and Green Engines), one of five Clean Sky engine demonstrators. The SAGE 4 demonstrator was tested in Munich last year. The demonstrator is based on a geared turbofan engine and incorporates a number of innovations, including components – blades for example – that are made from new materials and come in a new design. In addition, the demonstrator features components produced using new manufacturing techniques. Advanced simulation methods and measurement techniques round off the gamut of new developments. Partners from industry and research are participating in this sub-project alongside MTU. Most of the new companies and institutes to join MTU’s innovation value chain come from Germany, but not all: some are based in the United Kingdom, Italy, Austria and Sweden. “Our objective was to bring together the best in class, and that’s exactly what we’ve done,” Dr. Jörg Henne, Senior Vice President Engineering and Technology at MTU, sums up. The outcome is a win-win situation for both sides: “In addition to new hardware, we also gain new partners,” he explains. The cooperation under Clean Sky provides the partners with an opportunity to get a foothold in the European aviation industry for the first time, or to establish themselves in a specific segment of the industry.

F/LIST receives new production commission from Fokker

In January 2016, F/LIST and Fokker Services B.V. launched a new development project for aircraft interiors. F/LIST will deliver the interior, intended for the aircraft type ARJ21-700 from Fokker’s client Commercial Aircraft Corporation of China (COMAC), directly to the Dutch business by the end of 2016. Prior to the end of last year, F/LIST closed a contract with the Dutch business Fokker Services B.V. to develop and manufacture exclusive interiors for a Chinese aircraft type. The primary challenge lies in transforming the COMAC aircraft type ARJ21-700 from a regional jet into a high-end business jet for the first time. The commission encompasses the galleys, the private suite including the VIP lavatory, the lounge area, the conference/dining area as well as the business class area along with the AFT lavatory. Over the course of production, F/LIST will also employ their expertise in engineering, in water system integration and in wiring all pertinent areas. F/LIST intends to deliver all construction components to Fokker Services by the end of 2016.

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FL Technics to design and retrofit Airbus A320s for Small Planet Airlines

FL Technics, a global provider of tailor-made aircraft maintenance, repair and overhaul services, has announced the signing of an agreement with the European leisure air carrier Small Planet Airlines. According to the newly inked agreement, FL Technics will carry out cabin re-design and refurbishment works on the carrier’s 13 Airbus A320s. The first fully-retrofitted aircraft has been already delivered to the carrier. Based on the contract terms, FL Technics EASA Design Organization has presented its vision with regard to modern interior concept, developed and approved all relevant modification changes for the carpeting, new seats and logo installation on new partitions. Moreover, the company has provided aircraft with new partitions and emergency equipment relocation services as well as supervised the production of the required elements. Since receiving approval from the carrier with regard to all aspects concerning the new interior, FL Technics’ base maintenance, EASA Design Organization and spare parts supply teams have completed full cabin refurbishment for the first out of thirteen Small Planet Airlines’ aircraft. The works covered installation of brand new seats, upgrading of the cabin lighting system, replacement of FWD partitions and carpet fitting, unification of emergency equipment layout and mounting of a new decorative LED logo on the aircraft partition. The aircraft has been successfully re-delivered to the carrier, while the retrofit works on the remaining 12 aircraft are scheduled to be completed in the following 4 months.

328 Design GmbH achieves first FAA STC for Dassault Falcon 50EX major cabin modernization

328 Design GmbH (328DO), part of the 328 Group, the Germany-based refurbishment, completions and aircraft maintenance specialist, has successfully achieved the first Supplemental Type Certificate (STC) for the Dassault Falcon 50EX from the US FAA under the FAA/EASA bilateral safety agreement. The STC covers extensive cabin refurbishment including the replacement of the legacy Cabin Management System/In-flight Entertainment (CMS/IFE) with Honeywell Ovation Select state-of-the-art Audio/HD Video Entertainment and CMS including T-PED (Transmitting Portable Electronic Device) connectivity via Wi-Fi. Additional features include a complete cabin refurbishment, replacing all hard and soft materials, the installation of new LED cabin lighting, and galley modification. The project was achieved in collaboration with USA-based Duncan Aviation at the company’s full-service facility in Battle Creek, Michigan. This latest STC marks 328DO’s 21st collaboration with Duncan Aviation in the four years the companies have been working together.

GE Capital Aviation Services (GECAS) has announced an expansion of its 737-800 passenger-to-freighter conversion program with Boeing. Boeing will perform the conversions on five GECAS 737-800 aircraft to freighters with the first aircraft scheduled for completion in the fourth quarter of 2017. “There is strong interest from carriers for the 737-800 freighters as both a replacement for older, less efficient freighters as well as for growth in the standard body sector,” said Chris Damianos, Executive Vice President Specialty Markets at GECAS. “The agreement with Boeing expands our ability to meet customer demand.”

AFI KLM E&M and Transavia extend Next-Generation 737 component services contract

Transavia has extended its long-term Boeing Next-Generation 737 rotatable components maintenance and pooling services agreement, dedicated to its Amsterdam-based fleet with Air France Industries KLM Engineering & Maintenance. The agreement comes under the Component Services Program (CSP) jointly operated by AFI KLM E&M and Boeing as the optimum response to the specific requirements of Next-Generation 737 aircraft fleets. The contract covers component maintenance and flexible availability solutions, including the management of components (part numbers) under a flight hour rate. All Transavia fleets are supported by AFI KLM E&M under the Boeing 737 CSP program.
Vector Aerospace certified for Airbus Helicopters H130/EC130 Tail Rotor Gearbox repair and overhaul

Vector Aerospace has announced the addition of the Airbus Helicopters H130 (formerly EC130 T2) and EC130 B4 tail rotor gearbox (TGB) to its existing range of rotorcraft repair and overhaul (R&O) capabilities. Vector will offer this expanded support for the H130/EC130 from its facilities in Langley and Richmond, BC, Canada, which already offer operators worldwide a range of services for Airbus Helicopters models including the H125/AS350, AS355, H130/EC130, BO105, H135/EC135 and AS332. Vector’s service offerings for the H130/EC130 family include D-level structural repairs, dynamic component repair (DCR), including main and tail rotor gearboxes, plus scheduled maintenance including 12-year inspections. Vector is also an authorized Turbomeca Arriel 2 repair center, supporting operators in North America.

Air New Zealand and AJW Aviation expand partnership with B767 PBH-programme

AJW Aviation has signed a new power-by-the-hour contract with Air New Zealand to manage component support for its B767 fleet of five aircraft. Air New Zealand’s own Boeing inventory will be held on site in Auckland to a defined list and the balance of spare parts will be held on consignment in Singapore. AJW has developed a range of innovative sunset solutions that build upon current market trends and utilize the Company’s Singapore facility. Boris Wolstenholme, CEO – AJW Aviation, says working together with Air New Zealand is consistent with AJW’s business vision to develop mutually beneficial partnerships that transform operational efficiency for airlines of all sizes. “Air New Zealand has a strong relationship with AJW. We already provide PBH services for its A320 fleet and it leases components from us. In turn Air New Zealand Engineering and Maintenance carries out maintenance on these components and supports the AJW TechniQue repair and overhaul service in Montreal. Together we have created a real hub for component support and maintenance in the Asia Pacific region as is evidenced by our recent collaborative service for Tigerair Australia’s A320 fleet.”

GA Telesis keeps commitment to supporting PW4000 engines with aftermarket support

GA Telesis will commence the disassembly of six PW4000 engines in the first quarter of 2016. The Company committed to a significant increase in its aftermarket support programs and announced its intention to disassemble over fifty commercial engines to meet both its customer and internal demands. The Company’s Component Solutions Group (“CSG”) will be supporting its customers with engine inventory from their global distribution facilities. Materials will be used in support of the Company’s airline and MRO customers currently operating A300/A310/A330, Boeing 747-400/767/777, and MD-11 aircraft.

Thales to equip over 700 Airbus single-aisles in Asia

Thales announced a string of successes for its avionics business in 2015 at the Singapore Airshow. The group will equip a staggering total of over 700 Airbus single-aisle aircraft in Asia. Thales signed contracts with 16 airlines, including China’s Air China and Shenzhen Airlines, India’s GoAir and Singapore’s BOC Aviation. Singapore is Thales’s primary regional hub for avionics, and handles both production of key systems as well as Repair and Overhaul. Locally, the Group manufactures flight control computer displays and electrical systems for Airbus A320s and A350s and for Boeing B787s. Key contracts signed in 2015 include, in addition to a number of undisclosed airlines, Air China and Shenzhen Airlines choosing Thales TopFlight Flight Management System (FMS) on a total of 91 Airbus single aisle aircraft. TopFlight FMS was also chosen by Mumbai-based GoAir, one of the fastest-growing low-cost carriers in India, for their brand new fleet of 72 Airbus A320ON-EO. Singapore-based BOC Aviation, one of Asia’s largest and most successful aircraft leasing groups, also chose the Thales FMS for their baseline avionics configuration. Most of the contracts signed across 2015 also include the Thales Low Range Radio Altimeter (LRRA) and the Thales/ACSS T3CAS surveillance platform. Singapore boasts one of the three global repair hubs for avionics and in-flight entertainment systems. It is responsible for a third of Thales’s Avionics repair and overhaul activities worldwide, covering the entire Australasian territory.

InTech Aerospace achieves AS-9110 quality certification

InTech Aerospace, a steadily-growing aviation technical services firm specialized in commercial and government airplane interiors and components, achieved full certification to AS-9110 aerospace quality standards in February 2016. Based in Houston TX, InTech Aerospace is poised for continued growth as commercial airlines fleets keep expanding. Performing a variety of overhaul, repair, and retrofit chores chiefly on aircraft interiors and related components on fixed-wing planes, InTech Aerospace today enjoys a client list that includes regional airlines, mainline carriers, large OEM’s, aircraft leasing companies, government aircraft, and major MRO facilities.
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China Airlines signs OnPoint materials agreement with GE Aviation for CF6-80E engines

China Airlines has signed a 15-year OnPoint materials solution agreement with GE Aviation for the airline’s fleet of CF6-80E engines, powering its Airbus A330 fleet. Under terms of the agreement, GE will supply material, including new parts, component repairs and used serviceable material to the airline for use in the overhaul of its CF6-80E engines. In addition, GE will have dedicated on-site personnel to manage the material requirements, availability and logistics in order to support the shop operations and work with China Airlines to improve the overhaul experience.

Messier-Bugatti-Dowty wins service contract from Singapore Airlines

Messier-Bugatti-Dowty (Safran) has signed a contract with Singapore Airlines, during the Singapore Airshow, to support the landing gear systems on its upcoming fleet of Airbus A350-900 jetliners. The airline’s first A350-900 will start revenue service soon. Since 2008, Messier-Bugatti-Dowty has also provided support services for Singapore Airlines’ A380 super-jumbo jets. This contract gives Singapore Airlines fast and continuous access to all spare parts needed for the braking, steering, monitoring and gear extension/retraction systems on its aircraft. These parts are manufactured not only by Messier-Bugatti-Dowty, but also by two other Safran companies, Sagem (electronic equipment) and Technofan (cabin, avionics and brake cooling fans). Messier-Bugatti-Dowty’s support services include the analysis of operating data for these components and the application of preventive maintenance plans to guarantee the on-time performance of Singapore Airlines’ airplanes.

Spairliners secures component care for Austrian Airlines

Austrian Airlines has begun using Spairliners for Integrated Component Care Support effective from January 2016. The long-term contract was signed in December 2015 and covers component pooling and repair solutions of seventeen (17) Embraer E195 aircraft. Sven-Uve Hueschler, CEO at Spairliners, says: “We will deliver the best services and knowledge to Austrian Airlines based on our comprehensive experiences on the E-Jet. As part of the long-term agreement we established a dedicated IT interface between Austrian Airlines AMOS maintenance IT system and Spairliners’ SAP system in order to handle component requests efficiently and reliably.” With this tailored IT interface all relevant request information can be accessed directly though the AMOS system which exchanges data with Spairliners’ SAP system automatically.

Parker Aerospace signs long-term agreement with Singapore Airlines

Parker Aerospace Customer Support Operations has signed a multi-year agreement with Singapore Airlines (SIA) to provide a comprehensive support package for its fleet of Airbus A350 aircraft. This agreement is part of an enhanced service offering provided by Parker in partnership with operators. The agreement provides maintenance, inventory pooling and leasing, reliability sustainment, and management with Parker Customer Support Operations serving as the administrative lead for this agreement.
AAR Aircraft Component Services unveils expanded Amsterdam Facility

AAR has expanded and updated its hydraulic repair and overhaul facility at AAR Aircraft Component Services – Amsterdam in response to rising demand. The renovation of the facility entailed a significant investment in state-of-the-art testing equipment, a reconfiguration of the space, and the hiring of additional personnel. Together, these updates more than double the capacity of the previous facility to handle work on a longer list of parts and systems, such as hydraulic pumps; flap, thrust-reverser and landing-gear actuators; and flow control and shutoff valves for various aircraft from Airbus, Boeing, Embraer, Bombardier and others. Two new test stands, developed by ACS – Amsterdam, are equipped with the latest advances in automation, complete with control software. The gearbox test stand is designed to meet aircraft flow and pressure test requirements for all Boeing, Airbus, Embraer, CRI and other airframes working on Skydrol fluid at 3,000 or 5,000 PSI, including new-generation aircraft. The facility’s existing universal bench has integrated higher levels of automation, eliminating the transition time required for a worker to activate settings manually. Measurements are taken and fed into an HTML report. A new logistics area and a central warehouse increase capacity and reduce turnaround times even in periods of peak volume, so that components are returned to service as swiftly as possible.

Garuda Indonesia Group and Airbus to expand longstanding relationship

Garuda Indonesia Group and Airbus have signed a Memorandum of Partnership covering enhanced Maintenance Training support to GMF AeroAsia, the maintenance and repair subsidiary of Garuda Indonesia, and a plan to study together a revitalisation plan for the Garuda Indonesia Airbus fleet. Since the signature of an agreement for Maintenance Training Collaboration in 2011, GMF AeroAsia and Airbus have developed a mutually beneficial collaboration for strategic maintenance training in Indonesia. With this agreement Garuda Indonesia Group and Airbus look into developing further their joint activities with GMF AeroAsia. In the fleet area, the agreement includes Airbus commitment to support the revitalisation of Airbus’ fleet at Garuda Indonesia. In this area Airbus will focus in particular on the suitability of the newest Airbus aircraft, the A320neo and the A330neo, in line with Garuda’s future needs.

Colorful Guizhou Airlines signs GE’s On-Point solution agreement on CF34 engines

Colorful Guizhou Airlines reached a 10-year On-Point solution agreement with GE Aviation for the maintenance, repair and overhaul of the CF34-10E engine fleet powering its seven EMBRAER 190 aircraft. The agreement is valued at more than US$55m over the life of the agreement. The airline placed a firm order of seven E190s at the 2015 Paris Air Show.

Singapore Airlines selects UTC Aerospace Systems C.A.R.E. program for A350 maintenance

UTC Aerospace Systems has signed a 12-year agreement with Singapore Airlines to provide asset management and repair services for the airline’s fleet of Airbus A350 aircraft. The long-term maintenance agreement is part of UTC Aerospace Systems’ Comprehensive Accessory Repair and Exchange (C.A.R.E.) Program. Under the customized C.A.R.E. agreement, UTC Aerospace Systems, through its global network of MRO companies in Singapore and other locations, will provide inventory support and maintenance, repair and overhaul (MRO) services for air management systems, actuation systems, electric systems and lighting on Singapore Airlines’ fleet of Airbus A350s.
German Aircraft Maintenance GmbH expands maintenance services at Paderborn-Lippstadt Airport

German Aircraft Maintenance GmbH, an engineering company certified according to EASA Part 145, now offers a much wider range of maintenance and repair operations at Paderborn-Lippstadt Airport. For the future, and in addition to Line Maintenance, the company is able to offer Base Maintenance services for a variety of Boeing and Airbus aircraft. The maintenance portfolio includes the following aircraft types: Airbus A300, A300-600, A310, A318-A321 and Boeing 737. A hangar, which can be heated and covers space of 4,000 m², is available to provide maintenance services for even larger aircraft, regardless of weather conditions. There is also space outside for up to ten airplanes of a size similar to an Airbus A320 or a Boeing 737. A 40-metre wide gate, which has been installed recently, provides a direct transfer to the apron and the security area at the airport.

MTU Aero Engines scores high at the Singapore Airshow 2016 with geared turbofan technology

This year’s Singapore Airshow proved a major success for MTU Aero Engines: the engine manufacturer secured orders worth over €500m (some US$570m), scoring high especially with PurePower PW1000G-family geared turbofan (GTF) engines. “In the commercial engine business, the GTF programs for single-aisle aircraft are key to how MTU’s future is defined,” commented MTU CEO Reiner Winkler, referring to the order books. “At our headquarters in Munich, preparations are currently going full steam ahead for the final assembly of the A320neo engine. MTU will assemble about one third of all the engines going into NEO jets. This is a pretty demanding task,” Winkler added. At the air show in Asia, Air Canada placed the biggest order; the carrier agreed to buy up to 75 aircraft powered by PurePower PW1500G engines for its fleet of Canadian airframer Bombardier’s Cseries jets. More orders from which MTU benefits came in for the PW1100G-JM, the geared turbofan variant powering the A320neo family of aircraft. VietJet Air, a Vietnamese low-cost carrier based in Hanoi, ordered 63 A320neos and A321neos equipped with this engine. U.S. aircraft leasing company Aerolease was won over by still another application of the geared turbofan; it signed a letter of intent for 20 Mitsubishi Regional Jets powered by PW1200G engines. A propulsion system that continued to be much in demand again at the Singapore Airshow was IAE’s V2500, the engine powering the A320ceo family of jets. MTU shares in an order placed by China Aircraft Leasing Group (CALC) for 23 aircraft.

Three of Chinese HNA Group’s subsidiaries sign V-Services agreement

Three of HNA Group’s subsidiaries have signed a V-Services Fleet Hour Agreement (FHA) to maintain its fleet of 46 V2500 engines. The agreement is for three of HNA Group’s subsidiaries: West Air, Beijing Capital and Tianjin Airlines. The V2500 engine is offered through IAE International Aero Engines AG, a multinational engine consortium whose shareholders comprise Pratt & Whitney, Pratt & Whitney Aero Engines International GmbH, Japanese Aero Engines Corporation and MTU Aero Engines.

AEI receives order from JMV Aviation for 11-pallet position B737-400SF freighter conversion

Aeronautical Engineers has signed a contract with Luxembourg based JMV Aviation to provide an 11 pallet position B737-400SF freighter conversion. The aircraft (MSN 24959) is high gross weight and is being modified at Commercial Jet’s Dothan, Alabama facility. The freighter will be re-delivered to JMV Aviation in June of 2016 and then will be leased to the end customer, West Atlantic.

Pratt & Whitney opens first manufacturing facility in Singapore

On February 15th Pratt & Whitney officially opened its first manufacturing facility in Singapore, through its subsidiary P&W NGPF Manufacturing Company Singapore. The 180,000 ft² (approximately 16,000 m²) facility, located at Seletar Aerospace Park, will produce fan blades and other key components for Pratt & Whitney’s new PurePower Geared Turbofan (GTF) engine family. With about 7,000 orders and commitments, including options, from more than 70 customers in more than 30 countries, the facility proves vital in supporting GTF engine components to customers in the Asia-pacific region and around the globe. It is only the second Pratt & Whitney production facility in existence to manufacture hybrid metallic blades, which are made with extremely lightweight materials that provide superior aerodynamic efficiency levels compared with any other fan in service, including composite blades of the same size class. The manufacturing facility borders the Pratt & Whitney Component Solutions (PWCS) facility, which opened in 2014 and is equipped with state-of-the-art repair capabilities. Collectively, the two buildings are part of Pratt & Whitney’s US$110m investment in Seletar Aerospace Park, Singapore’s newest aerospace industrial park.

AFI KLM E&M signs new services contracts with various airlines at Singapore Airshow

AFI KLM E&M and SF Airlines have finalized an engine support contract covering three CF6-80C2 engines owned by the Chinese airline. The scope of the contract includes repair and overhaul of the three engines, plus spares support with provision of spare engines.

Fast-growing South Korean budget airline Jeju Air is expanding its fleet of Boeing 737-800s. As a result it has formally agreed to extend its current engine maintenance contract with AFI KLM E&M, with a further 18 shop visits. The long-term agreement covers full support – maintenance and repairs – of the CFM56-7B power plants equipping Jeju’s 737-800 fleet, which will grow to 40 aircraft.

AFI KLM E&M and Uni-Top Airlines have signed an agreement organizing support for the CF6-80C2 engines powering the Chinese carrier’s seven A300 aircraft. The contract includes repair and overhaul of the engines concerned, along with spare engines to guarantee operational availability of Uni-Top Airlines aircraft. A total 14 shop visits have been scheduled to date.

Malaysia’s EagleExpress Air signed its first contract with AFI KLM E&M. The component support contract, signed during the Singapore Airshow, includes component repair, access to AFI KLM E&M’s global A330 spares pool and a main base kit to be located at Jeddah. The support contract covers the six aircraft recently acquired by EagleExpress Air. Under the terms of the agreement,
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Eagleexpress Air will benefit from AFI KLM E&M’s logistic centres in Dubai and Singapore.

Additionally AFI KLM E&M and GMF AeroAsia have signed a Memorandum of Understanding (MOU) during the Singapore Airshow. This MOU aims to extend and develop their present partnership in the MRO sphere. Recently the companies also signed a CFM56-7B overhaul and repair contract, together with a contract for Boeing 744 C checks. The number of engines and aircraft covered by the two contracts can be extended. The newly-signed MOU covers several areas of cooperation, including component support synergies for Boeing and Airbus fleet and the maintenance of GE90, CFM56-7 and other CFM56 engine series supported via AFI KLM E&M global network. In the framework of this MOU, AFI KLM E&M is considering subcontracting maintenance services for 747 series to GMF in addition to those already contracted. These concern specific aircraft maintenance programs for several fleets, especially the 747-400s. One heavy C- and D-type check has been scheduled for 2016 involving KLM’s 747-400s. “The extension of this agreement with a major MRO in Asia Pacific demonstrates the competitiveness of our component and engine offering. We are honoured to be able to strengthen our long-term cooperation with GMF AeroAsia” said Franck Terner, EVP AIR FRANCE KLM Engineering & Maintenance. “A wide range of topics are currently under discussion”, added Ton Dortmans Executive Vice President KLM E&M. “This MOU is a natural continuation of the successful partnership agreement already signed in 2014.

Air Incheon renews power-by-the-hour contract with AJW Aviation

AJW Aviation will continue to provide full ATA Chapter power-by-the-hour support for low-cost cargo operator Air Incheon’s growing fleet of Boeing aircraft. The contract commenced in 2013 and has been extended for a further two years. It also includes a main base consignment that is located by AJW at Incheon International Airport in Seoul. Air Incheon operates routes throughout China, Japan, Russia, Mongolia and South Korea. This power-by-the-hour contract will be fully supported by AJW’s Singapore hub and significant Boeing inventory, which allows Air Incheon to be supported in real-time.

Werner Aero Services and DAS create nacelle support partnership

Werner Aero Services has entered into an agreement with DAS (Dallas Aeronautical Services) to provide support for B737NG aircraft nacelles and flight controls. The partnership with DAS was strategically created to allow Werner Aero Services to better support airlines in the Americas using DAS’s repair and overhaul services. DAS operates two commercial repair facilities – one centrally located in the United States in Dallas, Texas and a newly opened facility in São Paulo, Brazil. Both locations provide 4A/7 AOG and repair support, in-house composite bonding ability and are purposefully located in cities with well-established aviation related infrastructure and resources. In addition to their engine nacelle capabilities, DAS completes extensive repairs on flight controls, radomes and other composite and structural components for Airbus and Boeing and major business jet OEM’s Bombardier, Gulfstream and Textron.

STS Component Solutions partners with OEM Branet

STS Component Solutions, a division of STS Aviation Group, has announced a new OEM partnership with Branet to distribute spares and execute MRO support for Boeing Cargo Restraints. Located in Sulphur, Louisiana, Branet possesses more than 20 years of experience in the aviation cargo restraint market, specializing in both spares and repairs of their products. Applications for Branet’s cargo nets include Boeing, McDonnell Douglas and Lockheed Aircraft. They carry the Boeing licensed PMA for cargo restraints for many Boeing aircraft, specialize in the 737 series, and are also a certified FAA repair station. As part of the distribution agreement, Branet products will be stocked strategically at each of STS’ inventory locations in an effort to support customers worldwide. Inventory will be placed in the United States, The United Kingdom, Singapore and Shanghai and will serve as a means to provide global coverage for this new product line.

Vector Aerospace signs exclusive long-term agreement with Broome Air Services and Hinterland Aviation

Vector Aerospace has entered into an exclusive long-term engine service agreement with JNP Enterprises, owner of Broome Air Services (BAS), based in Western Australia and Hinterland Aviation, based in Queensland (QLD), Australia. As per the terms of the five-year agreement, Vector Aerospace will provide comprehensive engine MRO services in support of the combined BAS and Hinterland Aviation fleet of Pratt & Whitney Canada (P&WC) PT6A turboprop applications, including the Cessna 208 Caravan, Beechcraft King Air B200 and Beechcraft B1900C, along with several other piston-powered light aircraft. Vector will provide these services from its P&W authorized PT6A Designated Overhaul Facility (DOF) in Brisbane, QLD, Australia.

Embraer signs pool agreement with Colorful Guizhou Airlines

Embraer has signed a long-term agreement for the Company’s Flight Hour Pool Program with Colorful Guizhou Airlines, providing a comprehensive components repair package for its E190 fleet. This is also the first contract that Embraer has signed for the program in China for commercial aviation. Established in June 2015, Colorful Guizhou Airlines is the first local airline in
Guizhou province, and also the first customer of Embraer’s E190 in this province. The airline inked an order for up to 17 E190 (seven firm orders and 10 optional) with Embraer, of which two were delivered and entered operation in December 2015.

Kaman and Zodiac add 737 MAX part numbers to MOU

Kaman Aerosystems has come to an agreement with Zodiac Interconnect Americas to manufacture and kit new components and assemblies for the 737 MAX aircraft landing gear electrical and fluid systems produced by Zodiac. The new part numbers, specific to the 737 MAX applications, will be added to the existing Kaman and Zodiac memorandum of understanding (MOU) announced in 2015. Work will be performed at Kaman facilities in Chihuahua, Mexico and Jacksonville, Florida and delivered to Zodiac’s facilities in Chihuahua, Mexico and Santa Rosa, California.

Pratt & Whitney’s Singapore Engine Center named center of excellence for GP7200 low pressure compressor overhauls

Pratt & Whitney Eagle Services Asia (ESA), has been named as a center of excellence for GP7200 low pressure compressor (LPC) overhauls by the Engine Alliance (EA). ESA will support Airbus A380 operators around the globe, with the first shop visits scheduled for LPC performance restoration. As a center of excellence, ESA will be responsible for disassembly, assembly and balancing of the LPC, which involves maintenance, repair and overhaul (MRO) for the five-stage low pressure compressor, fan hub, drum, blades and stator assembly. ESA already performs heavy maintenance on GE90 and PW4000 engines, the two designs which formed the foundation of the GP7200 engine.

Sichuan Airlines and UTC Aerospace Systems extend A320 nacelle maintenance agreement

Sichuan Airlines has chosen UTC Aerospace Systems’ unit in China, Goodrich Aerostructures Service China (GASCH) to provide nacelle asset support and maintenance, repair and overhaul (MRO) for the airline’s fleet of Airbus A320ceo (current engine option) V2500-powered aircraft. This agreement is an extension of an existing Prime Solutions support agreement. Prime Solutions is a flexible suite of nacelle maintenance services offered by UTC Aerospace Systems that can be tailored to meet each specific airline’s needs. The MRO support for Sichuan Airlines will be provided at the GASCH facility in Tianjin, China, which opened in 2009. The facility was purpose-built to provide MRO service to airlines throughout China.

App-ropriate reserves in severe environments
Royal Aero’s Midas-Severity™ App

Royal Aero have launched their MIDAS-Severity™ App on both Apple and Android platforms. This application provides our contracted customers the ability to calculate the predicted life of aircraft engines in the palm of their hand, from anywhere in the world. The App is powered on a real-time basis from Royal Aero’s MIDAS™ Engine Management Platform, which is used by several of the world’s leading aircraft lessors to manage their fleets. The life of an aircraft engine between overhauls is affected by operational and environmental factors. Years of empirical data, collected and then analysed has enabled Royal Aero’s engineers to identify the arithmetic relationships in these factors and produce the algorithms to describe these in a mathematical model called MIDAS-Severity™. The model is used to predict the life on wing and the cost of the next rework of any narrow or wide body engine marque, at any flight length in its operational envelope, anywhere in the world. This enables reserve rates to be considered based on the operation of a specific aircraft rather than generic OEM information. Even in recognised harsh environments such as the Middle East, China or India, the data showed differences in the effect on engines depending on the exact location of the operation. Royal Aero engineers have been able to study these operational effects when engines are disassembled and then feed this data back into the model. Some of the results have been startling and modern engine design and development has resulted in a consistency of life not previously available. The big challenge is to analyse and clean the available data to remove unusable data points. Engines can change region and flight length, can be removed due to policy reasons or premature failure and some operate at a higher thrust rating to prolong life on wing. The MIDAS-Severity™ model is available in an App that can be downloaded from the App store to make this information available to our contracted customers who invest in aircraft engines.
Lufthansa Technik rejuvenates the flagship of the Lufthansa fleet

Lufthansa’s first Airbus A380, the “Frankfurt am Main” with tailsign D-AIMA, recently completed a major overhaul involving 90,000 working hours and a two-month layover. Encompassing two passenger decks and a total of 509 seats in four classes, D-AIMA underwent its Intermediate Layover or “IL-check” at Lufthansa Technik Philippines. The aircraft had previously recorded a total of 2,671 flights in 23,595 flight hours. “We have been preparing for this layover since the 2nd quarter of 2015,” says Rainer Janke, Vice President for Marketing and Sales of Lufthansa Technik Philippines. “We were able to accumulate a wealth of experience in recent years with the A380 type, building up our heavy maintenance capability and performing major modifications.” The A380’s IL-check poses a particular challenge for any MRO, in terms of coordinating the different trade disciplines. Some 180 employees in total were deployed on the D-AIMA. In addition to the aircraft structure, the entire cabin was also completely overhauled in the specialist local workshops and now looks “as new” for passengers. A month after D-AIMA arrived, a second Lufthansa A380 with tailsign D-AIMB flew to Manila for the same type of check. For a time, the two A380s underwent their heavy checks in parallel. D-AIMB is expected to be released in the next weeks.

Lufthansa Technik enters into new long-term agreement with Tigerair Taiwan

Lufthansa Technik AG has entered into a new long-term agreement with Taiwan-based low-cost carrier Tigerair Taiwan. According to the new contract, the Hamburg-based maintenance, repair and overhaul (MRO) provider is now responsible for providing maintenance services including LRU (line-replaceable unit) services for the Auxiliary Power Units (APU) of Tigerair Taiwan’s growing A320 fleet. The long-term contract covers maintenance for Tigerair Taiwans APUs, the overhaul of APU components as well as pooling supply of APU components via Lufthansa Technik’s warehouse in Singapore. Based at Taiwan Taoyuan International Airport, Tigerair Taiwan started operations in 2014 as the country’s first low-cost airline.

Lufthansa Technik AERO Alzey and Batam Aero Technik plan a co-operation for PW127M engine maintenance

Batam Aero Technik and Lufthansa Technik AERO Alzey (LTAA) have signed a Memorandum of Understanding during the Singapore Airshow about their intention to cooperate in the area of PW127M engine MRO in the future. Batam Aero Technik is the technical arm of the Lion Air Group which operates, worldwide, the biggest fleet of ATR aircraft within its group airlines Wings Abadi and Malindo. LTAA is a leading engine MRO service provider for regional airlines with full capabilities not only for the PW100 and PW150 turboprops, but also the complete CF34 turbofan engine family. Within this cooperation LTAA will provide comprehensive support for Batam Aero Technik for the build-up of an engine MRO facility for its PW127M engines in Batam. Until the new facility reaches the required capabilities to support Lion Air Group’s fleet of PW127M engines, LTAA will provide the respective services in its own facility.

Lufthansa Technik to provide full life cycle support for A350 XWB nacelle components

Lufthansa Technik AG and UTC Aerospace Systems, supplier of the Airbus A350 engine nacelle, have signed a long-term agreement to enhance Lufthansa Technik’s ability to offer rotatable material provisioning and MRO (maintenance, repair and overhaul) services on A350 XWB nacelle components. Lufthansa Technik now provides its customers the full range of life cycle support services for Airbus A350 XWB nacelles, including advanced exchanges, lease and loan options, high-tech repairs, modifications, and OEM approved on-site repairs around the world to quickly resolve aircraft on ground situations.
Lufthansa Technik news

Lufthansa Technik Design Organization receives EASA Part 21/J approval for Airbus A350

The Lufthansa Technik Design Organization has extended its scope of work under the company’s existing Part 21/J approval of the European Aviation Safety Agency (EASA) to include the Airbus A350. The MRO provider is thus authorized to develop and approve minor repairs and changes on its own authority. This privilege accelerates the approval process significantly and can be decisive in operational terms, for example with respect to dispatch reliability or cancellations. Aircraft maintenance is typically carried out in accordance with the manuals. However, if an MRO provider has an approval under Part 21/J, then it can independently approve minor repairs without having to involve the respective authority. While the design approvals of the EASA Design Organization are basically limited to the scope of the European Union’s authority for aviation safety, they can also be used outside of the EASA, provided the respective national authority recognizes the European approvals. Since this is the case in many countries, the actual impact of the approval extends significantly beyond the scope of the EASA.

LH-A350-Ankunft at LufthansaTechnikAG

Photo: Lufthansa Technik
FLY Leasing posts fourth-quarter and full-year 2015 financial results

FLY Leasing has reported its financial results for the fourth quarter and full year of 2015. FLY is reporting net income of US$27.7m for the fourth quarter of 2015; this compares to net income of US$15.5m for the same period in 2014. The fourth quarter 2015 results include an impairment charge of US$18.9m related to three older aircraft, as well as US$17.0m in gains on sale of aircraft, and US$37.9m in end of lease income (of which US$15.0m relates to the three impaired aircraft). There were no sales in the 4th quarter of 2014, and end of lease income for that period was US$21.7m. Total revenues for the fourth quarter of 2015 were US$139.0m, compared to US$120.3m for the same period in the previous year, an increase of 16%. Rental revenue includes approximately US$12.5m in rents from aircraft that were sold or are contracted to be sold. Net income for the year ended December 31st, 2015 was US$6.6m, compared to US$56.1m for 2014. The 2015 results include US$84.3m of non-cash impairment charges and US$17.5m in charges associated with the early repayment of debt. For 2015, end of lease income was US$64.8m and gains on aircraft sales totaled US$26.1m. The 2014 results included US$39.8m in end of lease income and US$18.9m in gains on aircraft sales. Adjusted Net Income was US$62.7m for the fourth quarter of 2015 compared to US$21.8m in the same period in the previous year. For the year ended December 31st, 2015, adjusted net Income was US$131.0m as compared to US$80.4m for the year ended December 31st, 2014.

Strong ATSG growth drives 2015 earnings’ gains

Air Transport Services Group, Inc. (ATSG), a leading provider of medium wide-body aircraft leasing, air cargo transportation and related services, has reported consolidated financial results for the quarter and full year ended December 31st, 2015. Revenues increased 15% to US$181.6m for the quarter, and were up 5% to US$619.3m for the year. Excluding revenues from reimbursable airline expenses, revenues increased 11% for the quarter and 6% for the year. Revenues for Cargo Aircraft Management, ATSG’s aircraft leasing business, grew 7% year-over-year. Pre-tax earnings from continuing operations increased US$9.4m to US$20.5m for the quarter and to US$39.2m for 2015. Excluding the effect of 2014 pension settlement charges, and derivative transactions in each year, Adjusted Pre-tax Earnings increased 13% for the quarter and 7% for 2015. This and other adjusted amounts referenced below are non-GAAP financial measures. Net earnings from continuing operations were US$13.3m for the fourth quarter and US$39.2m for the year. Those earnings increased 23% for the quarter and 8% for the year, excluding the 2014 pension settlement charges. Operating loss carryforwards for U.S. federal income tax purposes offset much of the company’s federal tax liabilities. Because of increasing tax depreciation on its aircraft growth investments, ATSG now does not expect to pay significant federal income taxes until 2019 at the earliest. Fourth-quarter adjusted EBITDA increased by 12% to US$56.8m. 2015 Adjusted EBITDA grew by 10% to US$198.2m. Record operating cash flow for 2015 stood at US$173.7m. The 17% increase from 2014 stemmed largely from higher income and faster payments from customers. 2015 capital expenditures were US$159m, cash debt repayments in excess of borrowings were US$24m, and share repurchases were US$10m.

The HAECO Group reports profit of HK$464 million in 2015

The HAECO Group has reported an attributable profit of HK$464m in 2015, compared to a profit of HK$573m in 2014. Man hours sold by HAECO in Hong Kong (HAECO Hong Kong) for airframe services increased by 13.8% in 2015. This reflected continued good demand and an increase in staff numbers. Man hours sold for line services in Hong Kong also increased in spite of a reduction in aircraft movements handled, as more work was done per movement. Man hours sold for components and avionics work in Hong Kong decreased. This reflected the retirement of Boeing 747-400 aircraft. The profit of HAECO ITM Limited (HAECO ITM) increased. This reflected higher utilization of rotatable parts as operations expanded. The profits of Hong Kong Aero Engine Services Limited (HAESL) decreased. Fewer engines were overhauled. This reflected the retirement of aircraft operating Trent 500 engines and a reduction in the frequency of scheduled maintenance of Trent 700 engines.

HAECO USA Holdings, Inc. (HAECO Americas) recorded a higher loss in 2015 than in the 11 months following its acquisition in 2014. This principally reflected completion of large, high-work-scope airframe services contracts and their replacement with smaller work-scope contracts. HAECO Americas also shipped fewer seats. Demand for its old seats declined and the replacement seats were not yet in commercial production.

The Group continued to invest in order to increase the scale of its operations and technical capabilities and to improve and widen the range of services it can offer to customers. Total capital expenditure for 2015 was HK$716m. Capital expenditure committed at the end of the year was HK$1,928m. (HK$1.00 = US$0.13 at time of publication.)

Satcom Direct Communications completes acquisition of Airbus U.S. Government business unit

Global aeronautical communications provider Satcom Direct Communications (SDC), has closed its purchase of Airbus DS SatCom Government (ASGI), expanding its market presence and offerings to the U.S. government sector. ASGI has been renamed Satcom Direct Government, Inc. and to acknowledge its heritage as part of COMSAT Mobile, will do business as “COMSAT”. The close of the acquisition is being celebrated at the Satellite 2016 conference currently taking place in Washington, D.C. SDC has acquired all of ASGI’s business operations as well as two satellite earth stations located on the East and West Coast of the United States. With a direct lineage from the COMSAT
organization that was created by the Communications Satellite Act of 1962, the company has played an important role in the satellite industry from its inception to the present day.

**Embraer releases fourth quarter and fiscal 2015 results**

In 4Q15, Embraer delivered 33 commercial and 45 executive (25 light and 20 large) jets. The Company ended 2015 with 101 total commercial aircraft deliveries, surpassing 2015 Guidance. Total executive jet deliveries of 120 aircraft (82 light and 38 large) met the executive jet deliveries Guidance for 2015. Revenues in 4Q15 reached US$2,074.4m and in 2015 were US$5,928.1m, also meeting the Company’s 2015 Revenue Guidance range of US$5.8 to US$ 6.3bn. EBIT and EBITDA margins were 3.1% and 7.9%, respectively. In 4Q15, and for fiscal year 2015 the EBIT and EBITDA margins were 5.6% and 10.9%, respectively. 4Q15 Net income attributable to Embraer Shareholders and Earnings per ADS totaled US$111.2m and US$0.6091 (US$29.7m and US$0.1627 per share excluding deferred tax and provisions relating to Republic’s Chapter 11 filing), respectively. 2015 net income attributable to Embraer Shareholders and Earnings per ADS totaled US$69.2m and US$0.3787 (US$ 272.0m and US$1.49 per share excluding these items), respectively.

**Air Lease Corporation posts net income of US$508m for full year 2105**

Air Lease Corporation reported another consecutive quarter of record fleet, revenue and profitability growth. The company generated adjusted diluted EPS of US$4.64 for the year ended December 31st, 2015, an increase of 15.1% as compared to US$4.03 for the year ended December 31st, 2014. ALC recorded adjusted diluted EPS of US$1.21 for the three months ended December 31st, 2015, an increase of 11.0% as compared to US$1.09 for the three months ended December 31st, 2014. ALC generated revenues of US$1.2bn an increase of 16.4% or US$172.3m as compared to US$1.1bn for 2014. The company generated revenues of US$326.7m for the three months ended December 31st, 2015, an increase of 14.3% or US$40.8m as compared to US$285.9m for the three months ended December 31st, 2014. ALC generated adjusted net income of US$508.0m for the year 2015, an increase of 15.8%, as compared to US$438.6m for the year 2014 and recorded adjusted net income of US$132.6m for the three months ended December 31st, 2015, an increase of 11.6%, as compared to US$118.8m for the three months ended December 31st, 2014. ALC signed agreements for 120 aircraft with 46 customers across 35 countries during the year ended December 31st, 2015, which increased its contracted rentals to US$20.9bn across its current and committed fleet and entered into an agreement to sell its entire fleet of 25 ATR aircraft to Nordic Aviation Capital A/S. A majority of the aircraft sales are anticipated to occur during the first half of 2016.

**AeroCentury earns US$6.4m in 2015**

AeroCentury, an independent aircraft leasing company, reported earnings totaling US$3.1m in the fourth quarter of 2015, compared to US$1.3m in the third quarter of 2015, and $0.5 million in the fourth quarter of 2014. The fourth quarter 2015 results reflect increased lease revenue due to improved utilization and higher gains from sales of aircraft. Net income increased to US$6.4m for the full year in 2015, compared to a net loss of US$11.3m for 2014. The 2014 results included US$18.7m of non-cash pre-tax write-downs on older equipment. During the fourth quarter of 2015, the Company sold three aircraft for cash, which generated gains totaling US$6.3m. For all of 2015, the Company recorded gains totaling US$12.0m for the sale of nine aircraft, including five pursuant to sales-type finance leases. Average utilization improved to 96% in the fourth quarter compared to 94% in the third quarter and 88% in the year-ago quarter. For the full years of 2015 and 2014, utilization was 92% and 82%, respectively.

**BOC Aviation posts 2015 net profit of US$343m, up 11%**

BOC Aviation has reported financial results for the year ended December 31st, 2015. Robert Martin, Managing Director and Chief Executive Officer, said: “In 2015, BOC Aviation had another very successful year, with record net profit after tax of US$343m, an 11% increase over 2014. The owned and managed fleet grew to 270 aircraft, and together with 241 aircraft purchase commitments at the year-end, our total fleet was 511 aircraft.” Total revenues and other income rose 10% to US$1.09bn, while total assets grew 9.4% to US$12.5bn at year-end. The company maintained strong liquidity with US$507m in total cash, bank balances and fixed deposits, and more than US$2.7bn in committed revolving credit facilities.

**HEICO Corporation reports 20% growth in first quarter of 2016**

HEICO CORPORATION reported that adjusted net income increased 20% to US$33.2m in the first quarter of fiscal 2016, up from US$27.6m in the first quarter of fiscal 2015. Adjusted operating income increased 20% to US$55.8m in the first quarter of fiscal 2016, up from US$46.4m the previous year. The Company’s adjusted operating margin increased to 18.2%, up from 17.3%. The adjusted results above exclude the impact of US$3.2m of pre-tax acquisition costs which the Company incurred in connection with a fiscal 2016 acquisition. These are one-time nonrecurring costs. Net sales increased by 14% to US$306.2m up from US$268.2m the previous year.

**DVB Bank posts 2015 net income of €45.6m**

DVB Bank generated consolidated net income after taxes of €45.6m (previous year: €79.1m), providing financing solutions and advisory services to its clients in the international transport sector. DVB origi-nated new international Transport Finance business at attractive terms, in spite of persistent and intense competition amongst banks on the financing markets. As at 31st December 2015, the Bank’s new business in Shipping Finance, Aviation Finance, Offshore Finance and Land Transport Finance comprised 190 transactions with an aggregate volume of €7.0bn – compared to 187 transactions with an aggregate volume of €6.3bn during the previous year. Net result from financial
AerCap reports record financial results for 2015

For the full year 2015 AerCap reported adjusted net income of US$1,275.8m, compared with US$855.5m for the full year 2014. Adjusted basic earnings per share of US$6.26, compared with US$4.86 for full year 2014. Increases in adjusted net income and earnings per share over the full year 2014 were driven primarily by the full year impact of the ILFC transaction and gain on sale of assets. The company reported net income of US$1,178.7m, compared with US$810.4m for the full year 2014 and reported basic earnings per share of US$5.78, compared with US$4.61 for the full year 2014. Increases in reported net income and earnings per share were driven by the same factors as adjusted net income. AerCap executed 405 aircraft transactions in 2015, including 117 wide-body aircraft. As of December 31, 2015, AerCap’s portfolio consisted of 1,697 aircraft that were owned, on order, under contract or managed (including aircraft owned by AerDragon, a non-consolidated joint venture). The average age of the owned fleet as of December 31, 2015 was 7.7 years and the average remaining contracted lease term was 5.9 years. AerCap authorized a US$400m share repurchase program, which will run through June 30th, 2016.

Airbus Group reports solid 2015 results

Airbus Group has reported solid 2015 results with its guidance achieved for all key performance indicators, reflecting continued operational improvement. Group revenues increased 6% to €64.5bn (2014: €60.7bn). This was mainly driven by Commercial Aircraft which registered an 8% rise in revenues on higher deliveries of 635 aircraft (2014: 629 units), including 14 A350 XWBs, and the strengthening U.S. dollar. Despite lower overall deliveries of 395 units (2014: 471 units), Helicopters’ revenues rose 4% and mainly reflected a higher level of services activities. Defense and Space’s revenues were broadly stable despite the de-consolidation of launcher revenues with the creation of the Airbus Safran Launchers Joint Venture’s first phase. A total of 11 A400M military transport aircraft were delivered in 2015. Group EBIT before one-off an indicator capturing the underlying business margin by excluding material non-recurring charges or profits caused by movements in provisions related to programmes and restructurings or foreign exchange impacts – rose to €4,132m (2014: €4,066m) with increases in all divisions compensating the lower Dassault Aviation contribution. Commercial Aircraft’s EBIT before one-off rose 10% to €2,780m (2014: €2,529m), reflecting a solid operational performance that included the A380 breakeven and cost control. Helicopters’ EBIT before one-off increased to €427m (2014: €413m), as lower deliveries were compensated by higher services activities, a favorable mix and progress on the Division’s transformation plan. Defence and Space’s EBIT before one-off rose 15% to €1,060m (2014: €920m), driven by strong programme execution across all business lines and progress with its transformation plan. Net income and earnings per share (EPS) increased 15% to €2,696m (2014: €2,343m) and €3.43 (2014: €2.99) respectively. The financial result was €-687m (2014: €-778m) and included one-offs totaling €-218m, mainly from a negative foreign exchange revaluation. 2015 net income and EPS were positively influenced by a lower effective tax rate following tax reduced capital gains from divestments. Group order intake in 2015 was €159bn (2014: €166bn), with the order book value reaching a record €1,006bn as of 31st December 2015 (year-end 2014: €858bn). Airbus has decided to increase the A330 production rate back to seven aircraft a month in 2017. (£1.00 = US$1.10 at time of publication.)

AE Materials Group acquires The Aircraft Group

AE Industrial Partners, a private equity investor in aerospace, power generation and specialty industrial companies, released that its wholly-owned AE Materials Group (AEMG) has acquired The Aircraft Group (TAG). TAG is a leading provider of aircraft consulting services for the purchase, sale or leasing of commercial aircraft as well as fleet asset management. Terms of the transaction were not disclosed. Founded in 1990 by Walter Andrushenko, TAG assists clients with the financial, technical and documentation requirements associated with buying, selling and leasing commercial aircraft. TAG’s core services include engine inspections, technical analysis, aircraft import/export services, lease returns, certification, and economic evaluations. TAG also has unique asset management capabilities through its TAG Fleet Online technology.

Aircastle to form joint venture with IBJ Leasing

Aircastle has reported that it has formed an aircraft leasing joint venture with IBJ Leasing (IBJL), a Japanese general leasing company which is part of Mizuho Financial Group. The joint venture, which will be serviced by Aircastle, will target investments in newer narrow-body aircraft leased to premier airlines. It is expected the joint venture will purchase its first two aircraft from Aircastle and that future aircraft investments will be acquired directly. Aircastle will own 25% of the joint venture.

ST Aerospace Resources to collaborate with Sojitz Corporation in aircraft leasing

ST Aerospace Resources has signed an agreement to divest 50% of its equity stake in Keystone Holdings (Global) to SJ Aviation Capital, a Singapore based subsidiary of Sojitz Corporation, for a consideration estimated to be US$10.7m. Upon completion, ST Aerospace Resources and SJ Aviation Capital will each own a 50% shareholding in Keystone Holdings. The completion of the agreement will be subject to the customary closing conditions that will lead to the execution of a joint venture agreement. Upon completion of the Proposed Transaction, the shareholders plan to continue to build up a portfolio of mid-life and end-of-life single-aisle aircraft assets, tapping on opportunities created by global aircraft fleet expansion and renewal. Keystone Holdings is the holding company for aircraft leasing investments. It cur-
recently holds subsidiaries in various geographies to support its portfolio purchase of aircraft which are currently on lease to global airlines. Based in Japan, Sojitz Group consists of approximately 410 subsidiaries and affiliates globally. As a general trading company, it engages in a wide range of businesses, including import, export, manufacturing and sale of various products. Sojitz also invests in various sectors and conducts financing activities.

MTU Aero Engines AG’s 2015 revenues and earnings at new record levels

MTU Aero Engines AG closed the financial year 2015 with new records. Revenues reached a new high of €4,435.3m (2014: €3,913.9m) while the group’s operating profit climbed to €440.3m (2014: €382.7m), an increase of 15%. Earnings after tax beat the previous all-time record set in 2014, rising by 21% from €253.3m to €306.9m. The commercial maintenance business achieved the highest growth rate in terms of revenues in 2015, increasing by 22% to €1,580.6m (2014: €1,298.9m). The key revenue driver was the V2500 engine that powers the A320, followed by the CF6-80 deployed by Airbus and Boeing in their medium- and long-haul wide-body airliners. Revenues in the commercial engine business grew by 14% to €2,414.0m (2014: €2,116.8m). The V2500, the GP7000 for the Airbus A380 and the GENx for Boeing’s 787 Dreamliner and 747-8 were the highest contributors. MTU’s order backlog grew by 12% to €12,493.7m in 2015 (2014: €11,176.5m), which represents a production workload of almost three years. In 2015, MTU saw a significant leap in earnings from its commercial maintenance business, where adjusted EBIT increased by 33% to €155.2m (2014: €116.3m). In the OEM segment, adjusted EBIT increased by 7% in 2015 to €285.0mn (2014: €266.2m). Due to changes in the product mix, the EBIT margin decreased from 10.1% to 9.8%. (€1.00 = US$1.11 at time of publication.).

Information Technology

GA Telesis has reported the launch of iGEAR (Intelligent Global Engine & Airframe Replenishment), as an enhancement to the company’s portfolio of current program services. Through iGEAR, GA Telesis will be capable of a customizable program covering flight-hour and supply-chain programs that will combine component supply-chain with aerostructure and engine maintenance for commercial airline fleets. GA Telesis’ Component Solutions Group will leverage its US$200m inventory to provide consistent program-based engine supply chain solutions, as well as airframe flight hour rotatable repair and exchange support; both of which can be tied to an engine services agreement with comprehensive engine overhaul and maintenance. As part of iGEAR programs, GA Telesis’s Composite Repair Group, Component Repair Group Southeast and GA Telesis Engine Services divisions will provide competitive repair services to reduce inventory ownership costs for airlines in need of customizable repair management solutions. Dedicated AOG support will be offered with iGEAR programs, utilizing the company’s Live AOG service center. The Company intends to announce its launch customer at AW’s MRO Americas 2016 in Dallas, TX.

Singapore-based Tigerair will be upgrading 34 Airbus A320 aircraft (21 firm orders and 13 optional) with the latest version of its Iridium satellite communications (SATCOM) system. Deliveries will begin later this year. The Rockwell Collins Iridium SATCOM system provides flight crews with reliable long-range voice and data communications over the global Iridium satellite network and supports both the Future Air Navigation System (FANS) and Aircraft Communications Addressing and Reporting System (ACARS).

Swiss International Air Lines (SWISS), the national airline of Switzerland, is renewing its focus on passenger experience in partnership with Panasonic Avionics by introducing in-flight connectivity and a new user interface design. The first of nine SWISS Boeing 777-300s has entered into service providing global inflight Wi-Fi and 3G phone services from Panasonic’s Global Communications Services. All are being line-fit at the OEM with the state-of-the-art system. Serving 104 destinations in 48 countries worldwide, SWISS is leveraging Panasonic’s unique broadband offering, which will allow passengers to email, surf the Internet, use social networks and even make calls. SWISS has also introduced Panasonic’s eXcite2 software to its in-flight entertainment (IFE) systems, which dramatically increases functionality and modernizes design, benefitting both the passenger and the airline. It introduces enhanced touch-screen performance for passengers, with faster navigation and response, 3D effects and animation, as well as more dynamic graphics and richer content.

Other News

Lowe Aviation Company has announced a major corporate overhaul that will see the aero service center separate its renowned Fixed Based Operation (FBO) division from its Avionics and Maintenance division. Henry Lowe, owner of Lowe Aviation, will continue to own and oversee the FBO division, still known as the Lowe Aviation Company. The Avionics and Maintenance division, now known as Lowe Aviation Services, will continue with a new owner—CEO & President Karl H. Gardner. Gardner has more than 30 years of customer service experience in avionics and aircraft maintenance, having owned and operated Gardner Aviation Specialist from 1993 to 2011. Lowe believes that Gardner is just the right person to uphold the solid reputation that Lowe Aviation Company has established over the last 70 years.

GE Aviation (GE) has announced the creation of a digital organization that brings all of the digital expertise from across the aviation indus-
try into one business. This new digital business will be led by Jim Daily as President and Chief Digital officer, Engineering and Technology for GE Aviation. GE Aviation Digital will form its own division within GE Aviation, supporting the operations of customers across the aviation ecosystem by leveraging data science, domain expertise and software capabilities to increase productivity and minimize down time. In addition to bringing an enhanced digital capability to the 35,000 engines that GE Aviation monitors every day, GE and its customers are working together to unlock new opportunities to grow and deliver more productivity beyond traditional services. GE is creating industry standards for cloud computing and strengthening collaboration with customers to work on solving their toughest challenges. GE opened their Middle East Aviation Technology Center in Dubai late last year to support customers’ operations by region. The advancements in data and analytic technologies at the center are examples of where GE is taking its Predix cloud platform for the industrial Internet, providing the foundation to create innovative applications that turn real-time operational data into actionable insights. Consistent with GE’s recent announcement establishing GE Digital led by GE’s Chief Digital Officer Bill Ruh, Jim will be responsible for the technology and business growth for the digital platforms and portfolio within GE Aviation. Daily joined GE Aviation in 2011 and will expand his current responsibilities leading Systems and Digital Engineering and Technology to include the role of chief digital officer.

**Boeing** engineers and designers have developed a self-cleaning lavatory prototype that uses ultraviolet (UV) light to kill 99.99 percent of germs. The cleaning system can disinfect all surfaces after every use in just three seconds. Boeing believes this self-cleaning technology, combined with touchless features, will enhance the passenger experience on commercial flights. Click here to download b-roll of the lavatory. The lavatory uses Far UV light that would be activated only when the lavatory is unoccupied. Far UV is different from the UVA or UVB light in tanning beds, and is not harmful to people. Boeing engineers have shown through testing on their prototype that this innovation can minimize the growth and potential transmission of microorganisms. Boeing has filed for a patent on this concept.

**Pratt & Whitney** has developed a new modeling and predictive tool to enhance its maintenance service offerings and increase customer value. Expanding its data analytics capabilities, Pratt & Whitney’s Big Data project leverages its deep engine design understanding with broad operational, maintenance and environmental data, such as flight length and the environment in which the engine is operated, to determine the impact of these combined factors to refine the predictability of average time between heavy maintenance shop visits. Advanced predictive modeling, combined with innovative maintenance practices, will enable Pratt & Whitney to reduce unplanned engine removals and optimize engine time on wing. This benefits both customers, through improved operational availability, and Pratt & Whitney, through cost reductions across the life of its fleet management agreements. With more than 10,500 active, installed large commercial engines flying around the world, Pratt & Whitney has been collecting and studying enormous amounts of data from its engines for decades. By implementing predictive analytics, Pratt & Whitney can customize workscopes, provide early warning detection, and improve visibility into the overall health of an operator’s engine fleet.

**AAR** has been selected by **Vision Systems**, a market leader in solar protection solutions, to integrate Electronically Dimmable Window (EDW) solutions for retrofit programs in Asia, the Middle East, Africa and North America. The EDW developed by Vision Systems is based on Suspended Particle Device (SPD) technology used to enhance passengers’ experience by improving visual and thermal comfort. The windows’ sleek, elegant design and their capacity to block heat and noise convey a peaceful, spacious and cooler atmosphere as passengers enter the cabin. The technology blocks more than 99.9% of harmful UV light, which protects the interior materials from fading.

The first of two **Universal Avionics**-equipped Fairchild C-26 Metroliner aircraft has been delivered to the customer. The upgrade was completed by **Worldwide Aircraft Services** of Springfield, Missouri USA with Program Management provided by W4 Limited, Fort Worth, Texas USA. The installation includes three EFI-890R Advanced Flight Displays, dual UNS-1Fw Multi-Missions Management Systems (MMMS) with 4-inch Flat Panel Control Display Units (FPCDU) and Terrain Awareness and Warning System (TAWS). The second C-26 aircraft is currently being modified with the same Universal equipment.
Maintaining APUs

In 1963 the Boeing 727 was the first jetliner to introduce a gas Auxiliary Power Unit (APU). They remain a critical part of aircraft systems and so is the maintenance and repair process. Keith Mwanalushi reports.

APUs provide secondary power for main engine starting, cabin air conditioning and electric power for aircraft while on the ground and can also provide electric power during in-flight operation.

The role of APUs is even more crucial in the event the main power systems fail. The Honeywell 131-9 APU was used in an emergency landing when U.S. Airways Flight 1549 splash landed in New York City’s Hudson River in 2009. Both CFM56 turbofans on the A320 were damaged and electrical generators went off line.

According to ATC Aerospace depending on the design, the APU can provide electric power, hydraulic power, pneumatic power or all three. Connecting to a hydraulic pump allows the crew to operate hydraulic equipment such as the flight controls or flaps. Having this function is also useful for a backup if there is an engine failure.

The typical APU on a commercial airliner is comprised of three main sections:

Power Section: This is the gas generator part of the engine and gives power to the shaft of the APU.

Load Compressor Section: This is a compressor mounted on the shaft. It provides pneumatic power to the aircraft. It has two actuated devices, the inlet guide vanes which regulate airflow to the load compressor and the surge control valve which allows the surge-free operation of the turbo machine.

Gearbox Section: This transfers power from the main shaft to an oil-cooled generator for electrical power. Inside the gearbox is where power is transferred to the engine accessories like the fuel control unit, the cooling fan and the lubrication module. There is also a starter motor connected through the gear train. It performs the starting function of the APU.

The 787 Dreamliner, uses more electric power than the typical airliner so the APU is only used to deliver electricity to the aircraft. Not having a pneumatic system simplifies the design but the trade-off is the high demand for electricity meaning the requirement of heavier generators.

Currently, experts at Lufthansa Technik see three main developments in the APU maintenance and repair business: Firstly, APU maintenance changed to FADEC (Full Authority Digital Engine Control) drives system with correct maintenance action to manage the on condition operation. Secondly, OEM’s have started to change the after sale market by choosing selected service providers. And lastly, the APU repair processes will be released from OEM to the selected service provider. Cost reduction for repair process versus damaged part replacement with pool or new material will be the challenge for the future.
The HGT1700 APU is derived from Honeywell’s 331 series APU, optimised for the Airbus A350 XWB. Ole Gosau, Head of APU Services with Lufthansa Technik notes that with the new HGT1700 there is the same level of monitoring and troubleshooting process as the engine services.

“Latest-generation APU of the A350 will have an advanced FADEC which has sophisticated built-in condition monitoring and reporting functions,” says Gosau. “This enables the operator to rely on the system’s ECAM to maintain the APU and cut scheduled maintenance tasks. The overall necessity to physically access the APU is dramatically reduced. Components will be repaired according CMM and maintenance actions are driven by physical inspection and troubleshooting,” he explains.

According to Honeywell, the 331-200 introduced several new technologies to the world of auxiliary power. The 331-200 APU was the first electronically controlled APU and the first to employ the same internal design as an existing turboprop engine, dramatically reducing development time and manufacturing costs.

The 331-500 series became the first Honeywell APU to use an eductor for oil cooling, eliminating the need for oil cooling fans. The success of this design led to its use on both the Honeywell 131-9B and RE200 series.

“OEM’s are applying more and more IP rights and licensing before an MRO is allowed to perform maintenance. This creates a huge additional challenge for MRO’s to keep cost low.”

Dennis Wetjens EPCOR Managing Director

“My company has no capabilities and IP rights for A350 APU, but for the future the company is considering building this capability.

EPCOR part of the Air France KLM E&M Group specialise in APU maintenance. Dennis Wetjens EPCOR Managing Director observes that the current APU market shows competition on various APU types (Boeing 737NG, 777, 787, A320, A330 and A340).

“For some redesigned aircraft the APU is a variant of the APU installed in the current generation. For the 787 and A350 a new APUs have been introduced.

Boeing have redesigned the tail cone of the new 737 MAX with a circular tail cone to fit around the exhaust vent of the APU, eliminating the vortex generators found on the 737NG. But,
Wetjens does not see such modifications as an issue in terms of maintenance or certification. “The redesign of the tail cone similar to the Boeing 787 is not expected to have an effect on the APU operation or time of installation and usage in the aircraft. APU maintenance is based on condition of the APU. The environmental conditions and individual operator usage will remain the key elements that will drive APU removal.”

Lufthansa Technik recently signed a long-term agreement with Taiwan-based low-cost carrier Tigerair Taiwan. According to the new contract, the Hamburg-based MRO provider is now responsible for providing maintenance services including LRU (line-replaceable unit) services for the APUs of Tigerair Taiwan’s growing A320 fleet.

The long-term contract covers maintenance for Tigerair Taiwan’s APUs, the overhaul of APU components as well as pooling supply of APU components via Lufthansa Technik’s warehouse in Singapore. Based at Taiwan Taoyuan International Airport, Tigerair Taiwan started operations in 2014 as the country’s first low-cost airline.

Gerald Steinhoff, Senior Vice President Corporate Sales Asia Pacific Lufthansa Technik, says: “Our support for Tigerair Taiwan proves Lufthansa Technik’s ability to efficiently meet the needs of successful low cost carriers in Asia. We are very proud to further develop our long and trustful partnership with airlines in Taiwan”.

In other news, last year, Pratt & Whitney AeroPower signed a long-term repair support agreement for the APSS5000 APU with Air India for its fleet of seven future and 20 existing Boeing 787-8 series aircraft. The support agreement covers repairs of the APU and its LRUs.

The APS 5000 APU is rated at 1,100 shaft horsepower and is designed to start and operate throughout the full range of the 787 operating envelope up to 43,000 feet. The APS 5000 is Boeing’s first more-electric APU. It produces 10 percent fewer emissions and is 50 percent quieter than current Boeing 767 APUs according to industry insiders.

In terms of APU maintainability, the maintenance policy is “on condition”, as it is for engines, Wetjens tells. “Hence like for engines the main criteria that triggers removals will be performance, monitored through trend monitoring solutions which provide detailed information on the APU performance and behaviour, and allow the operator or its MRO to make recommendations for APU removal from the aircraft during regular down time, thus preventing operational disruptions.”

Regarding the specifics of APU behaviour on wing, Wetjens continues to explain that the operational environment and APU usage are key elements that are causing APU removals. “Various elements can influence the condition of the APU and result into a removal, such as EGT increase resulting from the wear of the APU gas path, the year of installation on the aircraft, or reaching the cycle limit on life limited parts. External elements such as Foreign Object Damage or corrosion, for example caused by de-icing fluids, may result in removals and maintenance.”

Wetjens adds that the geographical location of the operator, destinations and airport facilities at the gate and when moving the aircraft around before take-off can also have an impact on the time on wing and the type of maintenance required.

In order to better serve its clients, EPCOR offers EPCOR trend monitoring solutions and offers further opportunities to strengthen the cooperation with operators, by scheduling APU maintenance activities for APUs in operation and during shop maintenance.

OEM’s applying IP rights is a challenge for MROs. Photo: Airbus
Revima APU is a wholly owned subsidiary of the Revima Group, an independent provider of APU, landing gear and sheet metal MRO services. It is one of the world’s most comprehensive APU repair and overhaul facilities, with capabilities covering 22 APU models fitted on over 20 aircraft families. The company is based in Normandy, France, where it has built 44 years of strong experience in APU maintenance that saw it release well over 13,000 APUs to date.

Prior to becoming an APU-focused supplier, the company accumulated over 20 years of main engine repair experience, further supporting the very solid background in powerplant MRO. It is also worth noting that Revima APU’s culture is a good balance of airline and OEM, having been associated with airlines (UTA and Air France) for over 20 years, and to OEMs (EADS and Hamilton Sundstrand) for over 15 years.

The backbone of Revima APU’s activity resides in its extensive APU and ATA 49 LRU repair capabilities, which Revima APU uses to support over 200 customers worldwide. These capabilities range from regional aircraft APUs (APS500, APS1000, APS2300) all the way up to the A380 APU, and include several other models in between covering a wide range of Airbus and Boeing applications.

APU leasing and APU fleet management services are other key services Revima APU has developed in the recent years, in a constant effort towards value-added services. The company currently carries a pool of over 30 spare APUs for short or long-term leases, and has appointed a dedicated APU pool manager. Recent investments include a second PW901C APU, which will be used to support long term B747-8 customers.

In response to ever increasing data generation from newer aircraft and to the resulting opportunities for proactive maintenance, the fleet management team has developed a custom-made APU health monitoring system that is already operational with airline customers. This system is developed in cooperation with a partner company and offers several benefits such as real-time alerting, an advanced graphical interface, APU parameters trending leading to unplanned maintenance reduction and operational reliability improvement.

Recent successes include the signature of long-term support contracts with operators such as Etihad, Royal Air Maroc and Malaysian Airlines, to name a few. Day-to-day customer dialogues are revealing a need for evermore innovative solutions combining various services, power-by-hour offers, and risk-sharing proposals. These innovations require the company to be very agile, which it has quickly adapted to through careful listening and understanding of customers’ needs.

Challenges are not missing, mainly under the form of increased competition from OEMs and MRO integrators. Cost reduction remains a number one priority for Revima APU, which is relying for this on its strong continuous improvement culture. The company believes that the market will continue valuing its position as a very experienced, independent APU repair specialist with unique product knowledge, breadth and depth of service offering.

In the coming year, Revima APU plans to continue growing its market footprint on most APU models it is currently supporting, including newer types such as the APS5000 for the B787. In a continuous effort to better control repair costs, TAT, and quality, the company will further invest into piece parts and LRU repair developments. A new 5-axis milling machine has been recently installed in its expanding backshop. Cost reduction through used serviceable material will also receive particular attention on selected APU models. Value-stream mapping events are scheduled in various areas of the shop, with the objective of improving workflows and operational efficiency. In addition, value-added services such as APU leases and fleet management will also be expanded through investments in additional spare APUs and further development of the company’s APU health monitoring system. On the IT side, the customer web portal will also receive further improvements.

Revima APU continues to see significant opportunities to leverage its 44 years of APU repair experience on a market that values the flexibility of an independent, customer-oriented supplier.
Industry Interview

In the hot seat.....

*Keith Mwanalushi* talks large engine MRO with Roberto Furlan, VP Engineering Engine Services at SR Technics.

**AviTrader MRO:** In terms of overhaul capacity for new and upcoming large engines, what investment or preparations have you made to meet future demand?

**Furlan:** The priority for our engine business is to optimise turnaround times and to control the repair window. In order to achieve this, we are continuously improving our in-house repair capabilities. For instance, our shareholder Mubadala Development Company recently signed major contracts with both GE (GEnx) and Rolls-Royce (TRENT XWB) for the maintenance and repair of their respective large engines, and SR Technics will use its long-standing know-how to support the introduction of repair capabilities for both engine types.

**AviTrader MRO:** New engine types entering service will see advances in parts repair technologies - Do you think we will see engine parts repair requirements and methodologies differ from previous engine generations? And if so, how?

**Furlan:** We believe there will be major changes in the repair processes in the future. That is not only because composite parts like fan blades and fan cases will be used extensively, but also because new designs such as blisks (bladed rotors) and other new materials such as titanium aluminides will be utilised on a greater scale. These changes in material and design will require new advanced repair technologies.

**AviTrader MRO:** The Asia-Pacific region draws much of the capability for large engine maintenance but labour costs have steadily increased. In your opinion what influence will this region have on engine work in the year ahead?

**Furlan:** Costs have indeed risen in the Asia-Pacific region, and we expect this to continue. Nevertheless, what is already known today is that the number of airlines and airplanes operating in this region are set to increase, which indicates growing demand for MRO services accordingly. In response, OEMs are likely to seek to control and provide MRO services locally. We are also growing our business in Asia. SR Technics has gained a competitive edge in the region by having a local facility for component repair in Kuala Lumpur, Malaysia in order to be close to the customers.

**AviTrader MRO:** Currently, which large engine types are you seeing the best demand for MRO services, and are you seeing any new trends with airlines in terms of large engine maintenance strategies?

**Furlan:** The OEMs will offer flight-hour agreements, sign JVs or establish a network of OEM-controlled shops. In addition, more and more leasing companies will influence the MRO business by using only OEM solutions. Also airlines will look more for flight hour agreement models and leasing offers.
Iran’s MRO market: Where are the opportunities?

Analysis by Paul Lyons, Strategic Director, International Bureau of Aviation

Iran has remained outside of the international business community for approaching forty years. First imposed by the US in 1979, sanctions were expanded in 1995 and again in 2006 following Iran’s refusal to suspend its uranium enrichment efforts.

On January 16, Implementation Day, it was announced that Iran has completed the requisite steps agreed to under the terms of the Joint Comprehensive Plan of Action (JCPOA) in July 2015. Iran agreed to scale back its nuclear efforts in return for an unfreezing of up to $100bn of assets and a lifting of nuclear-related sanctions.

At the time of this writing, the relaxation has led to a glut of orders with Airbus, Embraer and ATR confirming c.200 orders between them, with Sukoi, Boeing, COMAC and Mitsubishi reported ly in discussions. The arrival of new aircraft will have a transformational impact on Iran’s MRO sector and this article by IBA explores the resulting opportunities for both international MRO operations entering the market and local operations gearing up to provide not only the aircraft maintenance aspect of the business, but also the infrastructure required to support a major enhancement to the updated, larger fleets, and the airfield operations that are required.

What is the current state?

While Implementation Day brings Iran out of isolation and creates enormous potential opportunities, the remaining sanctions and complexity around the US position in particular suggest operators and investors should still tread carefully.

Iran has spoken of driving $50bn of investment per annum and deals with Airbus, PSA and Daimler in the first two weeks since lifting suggest this figure is achievable. In the short term at least however, US companies will be largely excluded from that effort given the non-nuclear restrictions they are still bound by.

Even in Europe, the picture is complex, with both industry and lawyers opining that we are still months from deliveries, though the mooted A340 placements from Airbus in the first half of 2016 would reinforce Iran’s commitment.

Iran is a large country, the 18th largest in the world by mass and home to some spectacular mountain ranges. Iran’s size, topography and lack of investment in transport networks make air travel improvements a priority. Indeed, alongside modernising the banking system, the unfrozen assets have also been predominantly earmarked for improvements in transport across air and rail.

The airports need modernising and are not built to cope with the increased numbers forecast. While there are twin aisle jets operating in country, it is not at the rate of utilisation and frequency that they will see in 12-24 months and when the dozen A380s that were recently ordered commence flying, they will only add to the potential bottleneck caused by the creaking airport facilities.

The domestic market:

As widely reported in news following Implementation Day, sanctions effectively froze the Iranian fleet in time. IBA’s JetData lists 243 aircraft operating in Iran, with 197 of them active. The youngest planes flying are still 11 and the average age of the active fleet is almost 23 years old.

To be competitive Iranian airlines need to urgently update fleets. More modern equipment will improve factors across the board:

• Iran has a mixed safety record, for instance only 27% of Iran Air’s fleet is permitted to fly in Europe.
• Costs are high too. MRO costs run at between 10-15% of direct operating costs on average and we understand that Iranian carriers spend upwards of 25% on maintenance as a result of old fleets and bespoke maintenance schedules.
• Due to sanctions, Iranian engineers have been devising methods of keeping aircraft flying which need a lot of support in-house, i.e. engineering to manufacture their own parts when supplies dry up, especially cabin, hold, and ancillary components. As manuals were not updated they have had to develop their own version of updated maintenance programmes without OEM support, and control this themselves. All this extra work has a direct impact on costs.
• Fuel too is likely to still be running at over 35% of costs, again directly as a result of flying inefficient engines.

Civil Aviation

Estimates of the scale of aircraft procurement vary between 400 and 600 aircraft over the next decade and $20bn-$50bn per annum. Latest official estimates suggest 581 aircraft and while IBA is interested to understand how smooth the adoption and rollout of new equipment will be, what is clear is that investment will be substantial and driven by three factors:
The relaxation of sanctions has led to a glut of orders.

1. The replacement of aircraft by Iranian airlines
2. Capacity growth by Iranian airlines. The more efficient aircraft will open up routes while the GDP growth will be matched by increased demand for flights – both domestic and international.
3. Inbound airlines juggling fleets or bolstering capacity to service the increased frequency.

The resulting changes in the MRO sector will manifest in a variety of ways:

- The establishment of EASA-equivalent certification from the Civil Aviation Organisation of Islamic Republic of Iran, Iran’s CAA.
- A shift to contemporary MRO practices.
- A lowering of prices and increased supply of key components.
- An urgent need for training on modern aircraft, particularly avionics, carbon fibre and other modern composites, which will be unfamiliar to Iran’s engineers. This is especially prevalent when ordering repair materials as storage requirements are critical for longevity of impregnated resins.

Heavy maintenance, IBA feels, is a potential growth area given Iran’s engineering expertise and competitive salaries.

The heavy checks will require more sophisticated test equipment, as new techniques have been developed especially in Avionic and NDT environment with thermography, laser depth measurement, ultrasonic damage detection for lightning strikes delamination, as well as moisture ingress detection.

**MRO – Supporting the growth**

Investors and international MRO operations have both been linked to the opportunities. When looking at a partner or acquisition, we would suggest that alongside the typical MRO specific issues such as inventory, quality of contracts, premises, current and future certification, special attention needs to be paid to training the technical and support staff. There are also Iran-specific concerns to maintain visibility of and these include:

- **Assumptions don’t materialise**: For instance, Iran’s middle class was identified as the driver of greater demand for air travel when the price of oil was significantly higher. Indeed, a lot of the assumptions around growth were likely based on oil prices that we will not see again for two years.
- **Sanctions navigation**: Two factors appear to cause the most concern: the level of remaining US sanctions which prevent dollar transactions, or unwittingly trading with SDNs. The IRGC sanctions remain in place and new constraints were imposed as a result of the missile test in October – thought to be an effort by hardliners to disrupt the Implementation Day efforts.
- The IRGC are classed by the US as SDNs and as result are blocked from US banks. It is IBA’s contention that this will result in a real challenge to progress as companies attempt to ensure they are not linked to sanctioned entities spread covertly across the economy of Iran and allegedly controlling over a third of the economy.

**• Snapback**: A return of sanctions would have an extremely negative impact on ongoing operations and in-country assets.

- **Corruption**: With sanctions relaxed the industry is still faced with the challenge of entering a difficult market. Iran, according to Transparency International, ranks 130th on the Corruption Perception Index – alongside destinations like Russia and Nigeria. The risk of corruption is currently high, as is the risk of unwittingly conducting business with an SDN given the opaque reach of the IRGC.
- **Infrastructure is a bottleneck**: Tehran airport will be developed ASAP with $8bn earmarked for improvements across Iran’s 50+ airports. Passenger capacity is likely to increase at a faster rate than airport development and that will bring its own challenges. As we saw with India a decade ago, unless infrastructure improvements are phased to accommodate growth, delays and cancellations are very likely.
- **Safety**: There is room for improvement in Iran’s air safety record and we would suggest that the growth forecasts assume that safety improves predominantly through the rollout of newer, more reliable equipment. International expansion won’t occur until improvements are tangible.

Additionally, where domestic players are keen to expand, European banks are well positioned to finance expansion. Given the uncertainty around growth, it will be essential for them to demonstrate robust business planning and feasibility studies when accessing finance.

*IBA was established in 1988 to provide independent expert business analysis and advice to the aviation industry.*

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A lesson in composite repair

There have been many articles and news about how composite technology develops and what the new trends are. Even though composite materials make the majority of a modern airliner, there are also older generation airplanes, where we see composite materials in good use as well. So how are these findings rectified? In this article, Magnetic MRO gives some insights into what a typical composite repair involves.

If you are doing maintenance work on a classic aircraft such as a Boeing 737-500, you have SRM repairs on flight control very often. The typical damage usually occurs on a honeycomb wedge edge. As an example we can take an outboard fore flap with wedge delamination. The flap edge wedge is a sandwich, which consists of two thin aluminum skins (thickness 0,016”) and an aluminum honeycomb in between. The aft thin edge gets some impact damage that occurs because of delamination, which occurs because of water ingress. After several flight cycles, the parts inside started to corrode and delamination became larger and larger, so it was no longer safe.

Now, the repair comes in. For good reparation results, we remove the component from the aircraft and bring it to the composite workshop, which has a separate sanding, preparation and bonding rooms. The bonding procedure takes place in the bonding room, which has positive air pressure and is free of dust, oil, contaminations air. The room has a stable, dry and warm atmosphere.

The first step is to get the correct assessment of the damaged area so we measure the length and width of the damaged area. It is very important to measure the square area of the damage, because for Boeing for instance, in accordance with the structure repair manual, you can only repair a maximum of 200 square inches.

The next step is to cut out the damaged skin and remove the damaged aluminum core. It is very important to cut out the damage in a manner that causes no additional damage.

When the core is removed - the most important step is surface preparation. We use the ac-130 “Boe-gel” procedure. Instead of “Panta”, “Boe-gel” is simpler and you do not need to have an additional tool to perform it. Remember that this procedure directly influences the bond quality. After applying “Boe-gel” we need to apply an adhesive primer. The procedure allows us to use a brush, but we do it using a spray gun. Do not forget to measure the thickness of the primer when you apply it to the surface. To save time, we prepare skin doublers at the same time too.

When the primer is baked, we can install the new honeycomb. For this procedure, we use vacuum bagging and “Anita” hot bonder with two heat blankets: one is the main heat blanket, the second is a compensation heat blanket. Do not forget to push a few thermocouples inside the honeycomb. After the curing cycle, we sand out the top of the core until it is flushed with the top of the adjustment structure.

When the core is ready, it’s time to install metal doublers. One thing not to forget is to add the positioning fabric. This will allow us to get the trapped air out from inside the repair. After that we repeat the vacuum bagging and the “Anita” procedure. Do not put thermocouples directly to the new installed doubler. The trace will occur.

When the curing cycle is finished, we examine the repair area visually, and with a tap tool test. If everything is ok - apply sealant on the doubler edge, fill papers, and send the flap to the paint shop for final finish restoration.

The repair performed looks easy, but a repair like this takes 24 man-hours to perform. You need to have a trained person, tools and more importantly, read all the precautions and notes in the Manual.

All metal to metal bond repairs are similar to this such as: Spoilers, leading edge slats, horizontal stabilizer, trailing edge ribs, and flaps.

Repair performed by Oleg Soovik, Andrei Mark.
The ATR Assembly of Members has appointed Giovanni Tramparulo as ATR’s new Chief Financial Officer. On the scope of his new position, he will be in charge of Controlling, Accounting & Treasury, Sales Financing, Credit & Risk Management and Internal Control. During his previous time at ATR, among other positions he had been Chief Financial Officer (2007-2010) and CEO’s Sales Finance Special Advisor (2010-2014). Before that, Giovanni had been responsible for ATR’s Department of Sales Financing. Since 2012, he had been CEO’s Sales Finance Advisor at Superjet International in Venice.

Chromalloy announced the formation of a new Strategic Business Unit – Asset Management Services – and the appointment of an experienced industry executive to lead the new aircraft engine trading, exchange, overhaul, and leasing enterprise. “Chromalloy is pleased to welcome Jim Guiliano, an extremely talented and successful business leader who assumes the helm of this new enterprise,” said Carlo Luzzatto, President. Asset Management Services will encompass the existing Chromalloy Material Solutions business while adding a wide range of services which include an investment and trading platform, pooling and leasing platform and commercial and technical advisory services.

Spirit AeroSystems has named Tom Gentile as executive vice president and chief operating officer (COO). Gentile will join the company April 1st, reporting directly to Spirit President and Chief Executive Officer Larry Lawson. Gentile has held a succession of leadership roles at General Electric divisions over the last two decades, most recently serving as president and chief operating officer of GE Capital.

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BAE Systems has appointed Charles Woodburn in the newly-created role of Chief Operating Officer. Charles will report to Ian King, Chief Executive, as an Executive Committee member and will be appointed to the BAE Systems Board as an executive director during the second quarter of 2016.

AJW Aviation has recruited an experienced international finance expert, Thomas van de Wiel, in the role of Chief Financial Officer to lead the finance and legal functions within the Company and support certain affiliates and subsidiaries of the AJW Group. As a Board Director, he will be responsible for the formulation of the financial and operational strategy for the business, controlling finance, taxation, corporate governance, forecasting and deal analysis.

HAITEC has strengthened its Senior Management Team with the appointment of Mathias Steinberg as Chief Commercial Officer and member of the Executive Board. He brings vast experience with 18 years in Business Development, Sales and Marketing during which he held management positions in the aviation industry with RUAG Aerospace Services, STTS Germany GmbH, Thomas Cook Austria AG, TUI Austria AG and LTU Group.