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MRO

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MORE BANG FOR THE BUCK

Is North America ready to bring widebody MRO home?

Company Profile
Rolls-Royce & Partners Finance

MRO News
from around the world

People on the Move
latest appointments

ICF Analysis

Additive Manufacturing takes the leap

2015 is expected to be a breakthrough year for the much talked about additive manufacturing processes. MROs have been exploring the influence of an additive manufacturing integration on future MRO processes, and many are already seeing some benefits of this new technology.

3D printing can be used by MROs to manufacture parts with complex geometries on the spot with higher accuracy compared to conventional welding. Additive manufacturing is a very fascinating potential development path for the airline industry.

Lufthansa Technik for instance told us that they are continuously observing new developments in the area of additive manufacturing and they are keeping up with the current development. With its newly opened innovation centre at the Lufthansa Technik base in Hamburg LHT says its preparing for new requirements and challenges.

However, LHT highlighted that they expect the process to still take some time until it really can influence base maintenance work significantly. Additive manufacturing is already being used at LHT within its innovation centre, but not yet in the daily base maintenance. The German MRO company said due to the increased usage of composite materials with new aircraft types for instance, LHT invested not long ago into a new, over sized autoclave and is prepared to continue its path implementing new production methods.

Our cover story this month, touches on the issue of additive manufacturing and how far along the technology is being used in the North American market. We also look closely at the shifting customer demand and market dynamics influencing the heavy maintenance sector in North America. Interesting stuff!

Happy reading!

Keith Mwanalushi
Editor

North American MROs have an opportunity to repatriate a large share of wide body work.
Photo: AAR Corp

Contents

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Registration

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Opinion

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MTU Maintenance signs CFM56-5 service agreement with Maldivian *Photo: MTU Maintenance*

MTU Maintenance signs exclusive agreement with Maldivian for CFM56-5 maintenance

MTU Maintenance has signed an exclusive eight-year maintenance agreement with Maldivian. The company, one of the leading engine maintenance providers worldwide, will provide Maldivian with MRO services for its CFM56-5B engines as well as engine lease support through MTU's newly founded engine lease company MTU Maintenance Lease Services B.V. The engines contracted power Maldivian's Airbus A320 and A321 aircraft which serve a growing number of destinations within Asia. MTU Maintenance will perform the engine overhaul at its Chinese location in Zhuhai. Government-owned Maldivian is the flag carrier of the Maldives.

Aircelle opens first U.S. facility in Indianapolis

Aircelle (Safran) formally inaugurated the Aircelle Services Americas facility at Indianapolis, Indiana, on April 13th, bringing the company's expertise in maintenance, repair and overhaul (MRO) for its jet engine nacelles that are operational across North and South America. The 17,000-ft² MRO shop provides high quality, cost effective and reliable maintenance solutions matched to customers' needs, having started with Aircelle-manufactured nacelles for regional aircraft and business jets – and now expanding to nacelles for single-aisle and widebody airliners. This facility marks the latest expansion of Aircelle's global MRO network, and is the company's first dedicated facility in the United States. Its area of responsibility covers the U.S., Canada, Mexico, Central and South America. In addition to metallic repairs, Aircelle Services Americas is specialized in composites work – which is particularly important with the increasing amount of composite materials utilized in jet engine nacelles.

Monarch Aircraft Engineering to provide MRO Services at new Copenhagen facility

Monarch Aircraft Engineering has been contracted to provide maintenance, repair and overhaul (MRO) at Boeing's new facility at Copenhagen International Airport to support GoldCare customers in the region. Working as a partner of Boeing's GoldCare programme, the aircraft maintenance provider will base a team of up to 20 skilled engineers in Copenhagen. The base maintenance, which will be carried out in a hangar leased by Boeing, will include all levels of phased checks, service bulletins and defect rectification. The new two-year contract complements the existing line maintenance MAEL carries at London Gatwick Airport. Ian Bartholomew, Managing Director of Monarch Aircraft Engineering Limited, says: "This is the latest step in our journey as a GoldCare partner for Boeing – one which we started in 2010, and have rolled out across all of our four UK maintenance bases. "Today marks an exciting new chapter as, for the first time, we extend our work to cater for the needs of GoldCare customers at an overseas base." MAEL's operation at the new facility received approval from the CAA this month.

FL Technics to provide Base Maintenance support to Turkmenistan Airlines

FL Technics, a global provider of integrated aircraft maintenance, repair and overhaul services, signed a Base Maintenance agreement with Turkmenistan Airlines. Under the agreement, FL Technics will provide C-Check support for the carrier's five Boeing 737 NG aircraft. The first Boeing 737-800 operated by the national airlines of Turkmenistan has already reached FL Technics premises in Vilnius, Lithuania. According to the contract, FL Technics engineers will provide a comprehensive set of maintenance works covered by the C-Check program. The scope of works will include, but not limited to functional and operational systems checks, repair, overhaul and exchange of internal components, inspection and repair of structure and composite elements, NDT, seat repairs, defect rectification, etc. In addition to the already delivered aircraft, FL Technics will serve four other Boeing 737s operated by Turkmenistan Airlines which are to reach Lithuania later this year.

Royal Air Maroc signs with AFI KLM E&M for 787 component support

The long-term contract signed between Royal Air Maroc (RAM) and AFI KLM E&M organizes component repair and overhaul services for Boeing 787s owned by the Moroccan flag carrier, with dedicated access to the AFI KLM E&M spares pool at Amsterdam. This latest agreement is an extension to the contract inked in January 2013, when RAM entrusted component support for its fleet of over 30 Boeing 737NG aircraft to AFI KLM E&M.

Beijing General Aviation establishes footprint at Changzhou Konggang Industrial Park

China's Changzhou National High-tech Industrial Development Zone recently inked a framework cooperation agreement with Beijing General Aviation Co. (BGAC), under which BGAC will invest more than 5bn yuan (approx. US$820m) over a five-year period in a move to establish the sole general aviation manufacturing and operation service hub in Jiangsu province of eastern China. Previously, BGAC, a state-owned general aviation firm in Beijing, had taken its first steps towards globalization when it signed a comprehensive cooperation agreement with New Zealand's Pacific Aerospace (PAL) and established a strategic partnership with AgustaWestland, one of the world's top three helicopter makers. BGAC will join hands

with Changzhou High-Tech Zone to set up the hub at Changzhou Aviation Industrial Park. The hub will support all of BGAC's general aviation operations across six provinces and one city in eastern China, by taking over the responsibilities for delivery, assembly and refitting of fixed wing aircraft, helicopters and business jets as well as general aviation operations, maintenance, training, supply of replacement parts and management of information-based systems. Over time, the hub will broaden its range of operations by expanding into manufacturing and research and development of aircraft.

Rolls-Royce, Alpine helicopters renew Fleet Operator Agreement

Rolls-Royce and Alpine Helicopters have agreed to extend a Fleet Operator Agreement supporting the Canadian company's M250-powered fleet. Alpine Helicopters, based in British Columbia and Alberta, Canada, has been providing year-round world class helicopter services since 1961. Alpine specializes in tourism sightseeing, helicopter skiing and commercial operations. Alpine operates a total of 19 helicopters powered by Rolls-Royce M250 engines, including Bell 407 and Bell 206 models. The Rolls-Royce Fleet Operator Agreement offers benefits tailored to Alpine Helicopters. Alpine commits to utilizing only genuine Rolls-Royce authorized parts and repairs through the M250 FIRST network.

Rolls-Royce opens Turbine Blade Casting Facility

Rolls-Royce marked the official opening of its new £110m Advanced Blade Casting Facility (ABCF). When fully operational in 2017, the 150,000 ft² (14,000 m²) facility in Rotherham will employ 150 people and have the capacity to manufacture more than 100,000 single crystal turbine blades a year. These blades will feature in a wide-range of Trent aero engines including the Rolls-Royce Trent XWB, which powers the new Airbus A350 XWB. The turbine extracts energy from the hot gas stream delivered by the engine's combustor and uses it to drive the fan and the compressors. The blades produced in Rotherham operate in the hottest part of the engine at temperatures up to 200 degrees above the melting point of their alloy and sit in a disc that rotates at more than 12,000 rpm, creating a centrifugal force equivalent to the weight of a London bus hanging off each blade. They are grown in a special process which ensures that they are created from a single metal crystal to

Blade1 *Photo: Rolls-Royce*

maximise their strength. They are then coated with a heat-resistant ceramic and when in use they are cooled with air that passes through a series of precisely placed holes in the blade.

K-Mile sign B737CL full service program

K-Mile, the 1st Thai cargo airline based at Suvarnabhumi Airport in Bangkok, has awarded TP Aerospace Leasing a long-term wheels & brakes Cycle Flat Rate (CFR) program in support of its current and planned B737CL cargo aircraft fleet. With TP Aerospace Leasing's highly flexible, cost effective, tailor made and plug'n'play Component Maintenance, Pool Access, Onsite Lease Inventory and Logistics Program in place, K-Mile will be able to save significantly financially as well as on time spent securing continuously ready-to-install wheels & brakes in support of its growing operation. K–Mile's business focuses on the needs of air express, courier, postal companies who require customized, reliable air cargo transportation and providing air cargo charter flight to South East Asia and other routes within the region.

Fine Tubes and Superior Tube expand operations in the Far East with new distribution partner in Japan

UK-based Fine Tubes and US-based Superior Tube have signed a two year contract with Fusoh Aviation Co., to act as their distribution partner in Japan for the aerospace and space sectors. Fine Tubes and Superior Tube see significant growth potential in the Japanese aerospace and space markets and, having worked successfully with Fusoh on an ad-hoc basis in recent years, were keen to establish a formal partnership. Fusoh Aviation's client base features a number of global aerospace manufacturers, including IHI Corporation, Kawasaki Heavy Industries, Mitsubishi Electric Corporation, Fuji Heavy Industries and also the Japan MOD and Coast Guard. Both Fine Tubes and Superior Tube have a long record of manufacturing high performance titanium, stainless steel and nickel alloy tubes for some of the world's most advanced civil and military aerospace projects. Designed for airframes, engines and flight surface actuation, the tubing supplied by the two companies is capable of withstanding some of the most critical conditions, including high pressures and high temperatures.

Boeing selects Nabtesco as first Japanese systems partner on 777X

Boeing has reached an agreement with Japanese partner Nabtesco to supply primary flight control actuation system on Boeing's new 777X airplane. Nabtesco is a long standing partner on the 777 program, supplying actuators for four flight control surfaces. With this new agreement, Nabtesco's scope of work will double to eight, including spoilers. Actuators are a critical part of an airplane's system that move such surfaces as ailerons on the wing and elevators on the tail to control an aircraft's orientation in flight. Nabtesco will become the first Japanese systems supplier-partner on the 777X program. This is the third in a series of 777X related agreements with major Japanese suppliers. In June 2014, Boeing announced that Mitsubishi Heavy Industries, Kawasaki Heavy Industries, Fuji Heavy Industries, ShinMaywa and Nippi would provide 21% of the 777X airframe structure. In November Toray reached an agreement with Boeing to provide the composite material for the 777X's super efficient fourth generation composite wing.

Exelis wins Airbus A350 XWB composite strut contract

Exelis has been awarded a multimillion dollar contract from Airbus to produce center wing box struts for the A350-1000 aircraft. This contract marks the second award for the new Exelis STaR (Struts, Tubes and Rods) product line following the A380 award announcement last year. Deliveries are scheduled to begin in 2016 and will continue through 2020. Under the contract, Exelis will fabricate composite struts for the center wing box section of the A350-1000. Critical to the aircraft's structure, the struts help distribute loads from the

Magnetic MRO acquires an A321-131 for part-out *Photo: Magnetic MRO*

wings and fuselage into the center wing box providing structural support for the airframe. Exelis STaR products, through the use of patented manufacturing technology licensed from Bodair S.A. and a unique strut design, provide a high strength-to-weight ratio alternative to metallic struts and deliver greater weight savings compared with competing composite production methods.

Magnetic MRO expands into Asset Management services with A321 part-out

Magnetic MRO, a Total Technical Care MRO organization based in Tallinn, Estonia, completed the acquisition of an A321-131 (MSN555) for part-out. The purchase, conducted on behalf of private investors, is the start of Asset Management practice at Magnetic MRO, which offers comprehensive turn-key value creation services for aviation investors. The services cover asset acquisitions, lease management, lease transitions, green life rebuild, and end-of-life management solutions for aircrafts and engines. The acquired A321 will be parted out in the United States, with warehousing, trading, and exchange management out of Magnetic MRO European locations, supported by 24/7 AOG team. A selected list of parts will be used to expand existing stock in support of comprehensive fleet-wide component programs for Magnetic MRO customers.

GE Aviation selects Strother, Kansas, to assemble Passport 20

GE Aviation chose its facility in Strother, Kansas, to assemble its new Passport 20, which will power the next-generation large-cabin business jet. GE's additional US$7m investment in machinery and equipment will enable Strother to assemble, maintain, repair and overhaul the Passport 20 engine, which will power Bombardier's Global 7000 and Global 8000 large, ultra long-range twinjets now in development. While the new engine assembly capability for Strother will not result immediately in adding to their almost 700 employees, it will contribute significantly to maintaining stable employment levels at the plant for many years to come. "This investment will position Strother to play a pivotal role across the entire life cycle of the Passport 20 engine," stated Tony Aiello, GE Aviation's vice president and general manager, Assembly, Test and Maintenance, Repair and Overhaul Operations.

GE and Bristow Group sign 10-year CT7 Engine Service Agreement

GE Aviation and Bristow Group signed a 10-year Maintenance Cost Per Hour (MCPHsm) service agreement covering Bristow's global fleet of CT7-8A turboshaft engines powering their Sikorsky S-92 helicopters. The contract encompasses Bristow's current fleet of more than 50 GE-powered S-92s and all future aircraft deliveries during the term of the contract. The agreement continues the long-standing GE–Bristow relationship by combining several short-term MCPH contracts into a single, long-term agreement designed to provide Bristow economical and predictable engine maintenance costs. In February, 2014, GE Aviation and Bristow Group signed the first engine service agreement for the CT7-2E1 turboshaft engine powering the new, twin-engine AgustaWestland AW189 helicopter. The agreement added Bristow's new AW189 helicopters to their global fleet of MCPHsm service agreement-maintained engines.

Boeing South Carolina-Built 787-9 Dreamliners added to company's production certificate

The U.S. Federal Aviation Administration (FAA) has added Boeing South Carolina-built 787-9 Dreamliners to the company's production certificate, PC 700. This allows Boeing to produce and deliver 787-9s from its South Carolina facility. 787-8 production was added to Boeing's PC 700 certificate in July 2012. The certificate is issued once an airplane manufacturer has demonstrated to the FAA that its facilities and quality management system meet the agency's stringent safety and reliability requirements. The addition of Boeing South Carolina's 787-9 production to the Boeing production certificate follows a successful FAA Manufacturing Inspection District Office audit that validated the site's compliance with the Boeing Quality Management System.

Flying Colours refurbishes first Sikorsky S-92 helicopter

Flying Colours, the North Americas-based completions, refurbishment and maintenance specialists, has refurbished its first Sikorsky S-92 helicopter at its Peterborough, Canada headquarters. Delivery of the nine passengers S-92 took place at the end of January. The helicopter, which is a VIP variant, features a unique and eye-catching electric blue themed interior designed exclusively by the Flying Colours team of specialist designers. The full work schedule included installation of forward four-place club and aft five-place club seating, fitting of a forward lavatory, extensive cabinetry work and, in a first for the helicopter industry, the laying of a LIST granite flooring finish in the lavatory and helicopter entrance.

First refurbished Sikorsky S-92 helicopter *Photo: Flying Colours*

Flightstar Aircraft Services completes first heavy check on Boeing 767

Flightstar Aircraft Services, located in Jacksonville, FL announced the completion of its first set of Boeing 767 heavy maintenance visits with the latest returning to service on February 22nd, 2015. These maintenance visits represent the first group of FedEx Express Boeing 767 aircraft that Flightstar will be performing in 2015. Such visits will not only include standard heavy maintenance checks, but also fleet bridging programs in select cases.

GE Evergreen Engine Services completes first GEnx quick turn shop visits

GE Evergreen Engine Services recently completed its fifth GEnx quick-turn shop visit, with two additional engines scheduled to ship this month. The quick-turn capability comes less than a year after the formation of the new joint venture in Taiwan with partner Evergreeen Aviation Technologies (EGAT). Launched on March 31st, 2014, the GE Evergreen Engine Services joint venture builds on more than 15 years of collaboration between GE and EGAT for engine maintenance, and the JV includes overhaul capability for CF6 and quick turn capability for GEnx. GE Evergreen Engine Services is on track to offer full overhaul capability for GEnx customers beginning in 2019.

Heli-One now certified to provide high-quality MRO Services for helicopters operating in Brazil

Brazil is the latest in a growing number of countries where Heli-One is able to deliver its leading helicopter maintenance, repair and overhaul (MRO) services. The National Civil Aviation Agency of Brazil (ANAC), which oversees safety and security of civil aircraft, components, operations and personnel licensing in the country, has certified all four of Heli-One's facilities around the world to work on Brazilian aircraft. The endorsement follows a rigorous, year-long inspection and audit process by ANAC officials. Heli-One is a segment of CHC Helicopter, the operating company of CHC Group (HELI).

NAYAK received base maintenance approval for Embraer Legacy 450 / 500 and 600 / 650

Nayak Aircraft Service announced the extension of base maintenance approval for Embraer Legacy 450 / 500 and Legacy 600 / 650. This means from now on NAYAK provides in CGN full main-

Lufthansa Technik to provide base maintenance services for AeroLogic's fleet

German cargo airline AeroLogic has commissioned Lufthansa Technik AG to provide base maintenance services for its fleet of Boeing 777F aircraft. Over the next two years, C-checks on the carrier's eight 777Fs will be carried out by Lufthansa Technik's subsidiary Lufthansa Technik Maintenance International (LTMI) in Frankfurt. The primary focus of these extensive checks – four of which will be carried out in 2015, and four in 2016 – is on maintenance of the aircraft's structure and all its systems. The first check has been scheduled for March 2015.

Lufthansa Technik to provide component support for long-range fleet of EVA Air

Lufthansa Technik AG has further extended its cooperation with Taiwan-based airline EVA Air and its subsidiary EGAT. According to the new contract, the Hamburg-based maintenance, repair and overhaul provider is now also being commissioned to provide component support for the Boeing 777-300ER fleet as well as the Airbus A330 aircraft the Star Alliance member EVA Air has ordered. Material is to be supplied for more than 30 Boeing 777-300ER aircraft by Lufthansa Technik at the Singapore location. The long-term contract covers the overhaul of components as well as engineering services in addition to the material warehouse and pool. Services for the Airbus A330 fleet were extended and now also include the newly ordered A330-300s. These aircraft will also be supported out of Singapore.

MOU signing ceremony Snecma and HAL *Photo: Snecma*

tenance support for authorized aircraft model scheduled maintenance. As Embraers Authorized Service Center in Europe Nayak's business jet maintenance team is looking forward to perform the full range of services for Embraer Legacy 450 / 500 (Line and Base), 600 / 650 (Line and Base), Phenom 100 (Line and Base), Phenom 300 (Line and Base), Lineage 1000 (Line).

Snecma and HAL to create joint venture and build a new production facility in India

Snecma (Safran), a leading manufacturer of aircraft engines, and Hindustan Aeronautics (HAL), a leading aerospace manufacturer, signed a Memorandum of Understanding (MoU) on January 28th, 2015 in Bangalore to explore establishing a joint venture in India for the production of aero-engine parts. The proposed joint venture will initially focus on the manufacture of high-tech parts for the Dassault Rafale's Snecma M88 engine, then subsequently contribute to other major aerospace projects of HAL & Snecma, in India and worldwide. Spanning over 30,000 m², the proposed joint venture's new plant is expected to benefit from substantial investment by the two partners, providing it with state-of-the-art machinery and equipment. This agreement marks a major step forward in the long-standing collaboration between Snecma and HAL. The proposed joint venture will further broaden the scope of the excellent relations established over the past 60 years between Safran affiliates and the Indian aerospace industry. For example, Snecma manufactures the M53 engines powering the Mirage 2000H "Vajra" fighters operated by the Indian Air Force.

Vector Aerospace captures growing market for AS350 Series 12-year inspections

Vector Aerospace Helicopter Services – North America (HS-NA) has recently conducted three 12-year inspections with plans to conduct a fourth this month. Vector Aerospace recently performed two Airbus Helicopters AS350 12-year inspections for Care Flight of Reno, Nevada affiliated with Air Methods, with plans to commence a third this month. Additionally, Vector Aerospace recently completed its first EC130-B4 12-year inspection for Garry Chernoff, a private owner in Penticton, B.C. Vector Aerospace has extensive repair capabilities required to conduct Airbus Helicopters certified 12-year inspections on the AS350 series, including an Airbus Helicopters approved fuselage fixture in-house as well as capabilities to perform floor and aft structural assembly; tailboom repairs/assembly and composite repairs including canopy assembly. Vector Aerospace also has Transport Canada Civil Aviation (TCCA) and Federal Aviation Administration (FAA) repair design approvals which are required to conduct Airbus Helicopters certified 12-year inspections.

Lord Corporation and Satair Group sign distribution agreement for aerospace products

Lord Corporation of Cary, North Carolina – a global leader in the management of vibration, motion and noise control – has signed a non-exclusive distribution agreement with Copenhagen-based Satair Group for its commercial fixed-wing product line commencing February

GA Telesis and L-3 sign avionics services agreement

GA Telesis has signed an avionics services agreement with L-3 Electronic System Services (L-3 ESS), a division of L-3 Aviation Products (L-3 AP). L-3 ESS will provide total avionics support for OEM and third-party components on Boeing and Airbus aircraft, initially focusing on the 737NG, 747, 757, 767 and A320 platforms. As the program evolves, L-3 ESS will look to expand its support to cover other commercial and military fleet types for GA Telesis.

"GA Telesis customers will receive the value of OEM support and the benefits of 50 years of focused MRO capabilities at a reasonable and predictable cost," said Trevor Ratcliffe, L-3 ESS President. "L-3 ESS will also provide GA Telesis with turnkey supply chain solutions that will streamline operations, maximize savings and further enhance the capabilities that GA Telesis can offer to its customers."

GA Telesis announces major Airport Component/LRU support program with F&E Aircraft Maintenance

GA Telesis has announced a major onsite component/LRU ("line replacement unit") support program commencing at three major international airports, Miami International Airport ("MIA"), George Bush Intercontinental Airport ("IAH" Houston) and Los Angeles International Airport ("LAX"). In cooperation with F&E Aircraft Maintenance ("FEAM"), GA Telesis will provide Boeing and Airbus components and LRUs at FEAM's line stations, starting with MIA, IAH and LAX and rapidly expanding to cover DFW, ANC, ORD, CHS, JFK, and ATL. FEAM will facilitate and manage component and LRU needs for their domestic and international line maintenance customers, thus significantly reducing airline AOG downtime. "This is 100% about reducing airline downtime between flights and getting airplanes back in the air. Our relationship with FEAM, will allow GA Telesis to know real-time when an airline customer is in need of a component or LRU and allow us to do what we do best; provide an effective solution," said Chris Rauch, Senior Vice President of Global Sales.

2015. Under the agreement, which focuses on the European, Middle East and African markets (EMEA), Satair Group – a world leader in the commercial aerospace aftermarket – will assume responsibility for aftermarket sales, distribution and support of a wide range of LORD Corporation isolation mounts and catalogue parts. These isolation mounts are fitted to numerous Airbus, Boeing, Bombardier and Embraer aircraft in operation today. The two global aerospace companies have already conducted business with for some 10 years, but this agreement is the first of its kind.

Fokker and SASMOS celebrate inauguration of Indian Joint Venture

Fokker Elmo, a business unit of Fokker Technologies and SASMOS HET Technologies formally inaugurated their joint venture for the production of Electrical Wiring Interconnection Systems (EWIS) for aircraft and engines, thus supporting the "Make in India" policy. The inauguration has taken place at the Joint Venture facility in Whitefield, Bangalore. The current SASMOS facility employs more than 250 employees. The Joint Venture enables optimized operations and further growth recognizing that the Indian aviation market is one of the fastest growing and most dynamic aviation markets in the world today. Aircraft manufacturers need Indian Industrial Participation, which presents excellent business development opportunities for the Fokker Elmo SASMOS Joint Venture to successfully support current and future customers.The Joint Venture will start with production of EWIS for the Boeing Company.

Royal Jet awards SR Technics contract for twelve CFM 56-7B engines

Royal Jet, the Middle East's foremost private charter company, headquartered in Abu Dhabi, capital of the United Arab Emirates (UAE), has awarded SR Technics, one of the world's leading technical providers of solutions to airlines, a five-year contract to maintain, repair and overhaul their CFM56-7B engine fleet. The CFM56-7B engines are currently in service on Royal Jet's six luxurious Boeing Business Jet (B737-700 IGW) aircraft, which are used by the carrier's prestigious VIP guests. The work on the engines will be carried out at SR Technics' world renowned facilities at Zurich Airport, Switzerland. The maintenance, repair and overhaul of the first of the twelve Royal Jet CFM engines began in the second week of February, 2015.

Piedmont Airlines' Dash 8 *Photo: Universal Avionics*

Universal Avionics FMS selected for Piedmont Airlines Dash 8 fleet

Universal Avionics has been selected by Piedmont Airlines, headquartered in Salisbury, Maryland, to provide GPS-based Flight Management Systems (FMS) for retrofit to their Dash 8 series 100 fleet. This contract is in addition to a previous award to provide Multi-function Displays for this same fleet. The new FMS will support operations with all procedural leg types in accordance with ARINC 424. This sophisticated capability allows flying the most complex procedures such as a heading to altitude, precision arc, procedure turn, holding pattern and more – all the necessary maneuvers required to accurately fly SIDs, STARs and approaches. The Flight Planning function is designed to provide the pilot with the quickest, most efficient means of creating a flight plan, and the most pilot-friendly method of altering the flight plan elements as desired or as required by Air Traffic Control (ATC). The integration through Field Aviation's Supplemental Type Certificate (STC) package supports future systems growth flexibility, as Piedmont's business and operational needs dictate. Modifications will be completed in 2015.

Airbus increases A320 rate, adjusts A330 for NEO transition

Airbus has decided to further increase the production rate for its very successful A320 Family to 50 aircraft per month from Q1 2017, matching market demand. Additionally, Airbus is adjusting the A330 production rate to six a month from Q1 2016 as it transitions towards the A330neo. With over 11,500 Airbus single aisle aircraft sold and more than 6,400 delivered to 317 operators, the A320 family includes the A319, A320 and A321.

Sagem's WEFA system to transmit maintenance data on A320 family jetliners is certified

Airbus has certified the WEFA system made by Sagem (Safran), intended to remotely track the situation and maintenance status of Airbus A320 commercial jetliners. The certification from Airbus opens a potential market of several thousand aircraft for Sagem. Sagem's WEFA system (Wireless Extension For ACMS/Aircraft Condition Monitoring System) allows airlines to remotely manage their flight data using a secure Internet connection, and therefore plan ahead for maintenance operations. Featuring a "plug and play" design, the WEFA system calls on the secure radio transmission of maintenance data collected in flight by the FDIMU (Flight Data Interface Management Unit), also supplied by Sagem. The core of the WEFA system is a 3G radio network for data transmissions between aircraft and with airports. It offers extensive processing capacity for data from the aircraft's avionics suite, prior to transmission to the ground to speed up maintenance operations. It calls on Sagem's proven encryption expertise. Sagem's WEFA system meets the emerging needs of the air transport industry, since it supplies data for preventive maintenance, improving flight safety and enabling airlines to lower their operating costs.

A pioneer in aircraft monitoring and maintenance systems, Sagem supplies Aircraft Condition Monitoring Systems (ACMS) on the Airbus A300, A310, A320, A380, A400M and A350 XWB.

AFI KLM E&M engine shop completes first GEnx overhaul

The AFI KLM E&M engine shop at Schiphol recently completed its first "Quick Turn" shop visit on a

GEnx-1B engine. This first operation is important as it marks the beginning of a product offer slated for substantial development in the years ahead. AFI KLM E&M has actively geared up to get ready for the entry into service of the latest addition to the family of GE power plants in order to offer top quality service explains Ton Dortmans, EVP KLM Engineering & Maintenance "In May 2014 we began to develop our GEnx capabilities, our 3-phase program was designed to train personnel, bring facilities to operational readiness, acquire the tooling, and deploy procedures as rapidly as possible. This meant we have been able to launch our offering in six months only, and the three phases of the program have all been finalized by EASA certification."

THAI signs GE OnPoint Solution agreement for GE90 engine fleet maintenance

Thai Airways International signed a 12-year OnPoint solution agreement for the maintenance, repair and overhaul of the airline's GE90-115B engines that power its 14 Boeing 777-300ER aircraft. The OnPoint solution agreement will enable THAI to have the highest quality services at a predictable cost. OnPoint solutions are customized service agreements tailored to the operational needs of each customer for any size fleet. These agreements help lower the customers' cost of ownership and maximize the use of their assets. Backed by GE's global support network, OnPoint services may include overhaul, on wing support, new and used-serviceable parts, component repair, technology upgrades, engine leasing, integrated systems support and diagnostics and integrated systems.

Monarch Aircraft Engineering gains Part M Subpart G approval

Monarch Aircraft Engineering has been granted Part M Subpart G approval as a Continuing Airworthiness Management Organisation (CAMO) by the European Aviation Safety Agency (EASA). Through the company's Part M approval, MAEL's experienced engineering team are approved to carry out tasks such as:

Continuing Airworthiness Oversight, Maintenance Planning, Approved Maintenance Programme Development, Reliability Programme Technical Records, Engine and APU trend monitoring and reporting, Defect Analysis, ,Maintenance Control and Planning, Structures and Repair Support, Scheduled Maintenance Check Pack Compilation, Aircraft Acquisitions and Lease Management, Warranty, ARC Reviews and Certification, OEM Interface Support.

BAE Systems to provide complete flight control electronics suite for Boeing 777X aircraft

Boeing has selected BAE Systems to provide the Remote Electronic Units (REU) for both variants of the 777X aircraft. An REU is an electronic unit that manages the aircraft's flight control surface actuators and interfaces with the Integrated Flight Control Electronics (IFCE), which BAE Systems was selected to provide in 2014. BAE Systems, which was selected through a competitive procurement process, will support the 777X technology advancements by developing and producing the REUs for localized control of the wing surface actuators such as ailerons, flaperons, elevator, rudder, stabilizer, high lift, and new wingtips.

STG Aerospace installs liTeMood in Latin America

Aircraft cabin lighting company STG Aerospace reported that Copa Airlines has become the latest airline to install its liTeMood retrofit LED lighting system representing the first airline in Latin America to complete a 737-800 liTeMood installation. With many of their 737NG fleet installed with Boeing Sky Interior, Copa looked for a cost effective solution to upgrade and harmonise the look and feel of cabin interiors of the older aircraft installed with fluorescent lighting. The liTeMood installation followed an on-wing demonstration in Panama during 2014. Founded in 1947, Copa Airlines serves as Panama's flag carrier flying more than 11 million passengers a year to destinations in 30 countries in North, Central and South America and the Caribbean.

Werner Aero Services signs Engine Material Sale and Management agreement

Werner Aero Services has signed a long-term Engine Material Sale and Management agreement with a major European MRO to provide marketing and distribution services of its engine surplus spares. Under the agreement, which covers the V2500A-5 engine products, Werner will distribute the components throughout its world-wide network of customers. "We are very excited for the opportunity to enhance our V2500A-5 engine business that has been growing in recent years. This agreement enables us to have continued supply to support our customers' needs," said Mike Cazaz, CEO of Werner Aero Services.

AMES granted class 4 airframe rating by FAA

Airborne Maintenance and Engineering Services, Inc. (AMES) announced that it has been granted a Class 4 Airframe Rating by the U.S. Federal Aviation Administration (FAA). This rating gives AMES broad approval to perform maintenance on nearly all commercial aircraft that can be accommodated within its hangar facilities. AMES, a subsidiary of Air Transport Services Group, recently expanded its Maintenance Repair and Overhaul (MRO) operations in Wilmington, Ohio, with the opening of a new 100,000 ft² hangar facility able to accommodate aircraft as large as a Boeing 777.

Ducommun awarded first direct contract on Airbus A350 XWB

Ducommun has been awarded its first direct contract from Airbus for the A350 XWB wide-body aircraft. Ducommun will provide titanium components for titanium assemblies that will be installed on the aft fuselage section of the jet. The components are already in production at Ducommun's Coxsackie, N.Y. operations center, which specializes in forming technology for shaping titanium, steel and other hard metals for challenging aerospace requirements. "This new contract establishes the baseline for Ducommun to continue expanding its support of Airbus in North America," said Anthony J. Reardon, chairman and chief executive officer. "We are focused on growing our relationship with this key original equipment manufacturer by providing value-added structural solutions for the innovative Airbus technology being implemented to make aircraft stronger, lighter, and more energy efficient. We already support the A350 XWB through an Airbus subcontract, and supply structural components for A320 and A330 aircraft, as well as aluminum fuselage skins for the A321."

AJW Capital Partners purchases A319 and B737-700NG

AJW Capital Partners Limited, part of the AJW Group of companies, has purchased an A319 (MSN 1068) aircraft. The deal covers the airframe only. Teardown is currently underway at eCube in St Athan, Wales, and components will support AJW's global fleet of Airbus aircraft operating under power-by-the-hour contracts. AJW Capital managed the transaction on behalf of its private investor base of high net-worth individuals who, alongside AJW Avi-

ation, seek to realise revenue from the conversion of airframes into component assets. AJW Capital is the AJW Group's principal investing division and is responsible for the purchase, sale and lease of large aviation-related capital assets, including whole aircraft and engines. AJW Capital Partners also completed the purchase of a Boeing B737-700NG (MSN 29094) coverering the airframe only. Teardown will shortly commence and the components will not only support AJW's power-by-the-hour programmes worldwide, but also bolster the strategic inventory hubs that underpin the organisation's award-winning component support programmes for airlines and operators of all sizes.

Kaman Awarded 777/767 fixed trailing edge kits LTA by Boeing

Kaman has been awarded a multi-year contract for the production of fixed trailing edge (FTE) kits and assemblies for the 777 and 767 commercial programs. The award from Boeing Commercial Airplanes is a continuation of the work Kaman has performed for Boeing since the launch of the 767 program almost thirty years ago. To date Kaman has provided more than 1,000 FTE kits and assemblies for each of the 777 and 767 programs since 1995 and 1986, respectively. Kaman is a leading supplier of integrated structures including metallic and composite structural assemblies and detail metallic parts for OEM and Tier I aerospace companies engaged in commercial and military aircraft programs. Kaman provides complete aerostructure solutions including design, tooling, manufacturing, testing, and product support.

Finance News

Willis Lease Finance reports net profit of $7.2m in 2014

Willis Lease Finance Corporation (WLFC) reported 2014 net income of US$7.2m, compared to net income of US$15.6m in 2013. After-tax income for 2013 included a one-time US$8.6m tax benefit. On record annual sales of US$174.3m, pre-tax earnings from operations increased 35.2% to US$10.5m in 2014 from US$7.8m a year ago and income before income taxes increased 4.8% to US$11.8m in 2014 from US$11.3m a year ago. In the fourth quarter of 2014, Willis Lease reported a net loss of US$0.3m, compared to net income of US$6.6m in the fourth quarter of 2013. The loss in the current period included US$2.7m of non-cash write-downs and the expensing of US$3.5m related to an engine repair. The foregoing expenses overshadowed an otherwise profitable quarter – excluding these charges, fourth quarter pre-tax income was US$5.5m.

Rockwell Collins completes sale of ARINC Aerospace Systems Engineering and Support

Rockwell Collins has completed the sale of ARINC Aerospace Systems Engineering and Support (ASES LLC) to Field Aviation, a privately held U.S. company. ASES provides aircraft modification, integration and maintenance services, as well as logistical and sustainment capabilities, for the Department of Defense (DoD), government, commercial, business and private customers. The sale of ASES, part of the integration plan announced by Rockwell Collins when it purchased ARINC in December 2013, includes operations in Oklahoma City and approximately 230 employees. Following completion of the acquisition, ASES will operate as Field Aerospace.

Embraer releases fourth quarter and fiscal year 2014 results

In the fourth quarter of 2014, Embraer delivered 30 commercial and 52 executive (38 light and 14 large) jets and ended the year with total deliveries of 92 commercial and 116 executive (92 light and 24 large) aircraft, thus meeting the Company's total deliveries Guidance for 2014. Revenues in 4Q14 reached US$2,045.5m and in 2014 were US$6,288.8m, also meeting the Company's 2014 revenue guidance range of US$6.0 to US$6.5bn. EBIT and EBITDA margins were 9.6% and 13.8%, respectively, in 4Q14, and for fiscal year 2014 the EBIT and EBITDA margins were 8.6% and 13.2%, respectively. EBITDA margin was within the Company's Guidance range of 13.0% to 14.0% for the year, Embraer finished 2014 with a total cash balance of US$2,423.6m and a net debt position of US$84.5m. 4Q14 net income attributable to Embraer Shareholders and Earnings per ADS totaled US$91.4m and US$ 0.4983, respectively, and fiscal year 2014 net income attributable to Embraer Shareholders and Earnings per ADS totaled US$334.7m and US$1.8247, respectively. For 2015, Company Guidance is for expected net revenues of US$6.1 to US$6.6bn driven by expected deliveries of 95 to 100 jets in the Commercial Aviation segment and 35 to 40 large jets and 80 to 90 light jets in the Executive Jets segment, with Defense & Security revenues of US$1.1 to US$1.25bn for the year. The Company's backlog ended 2014 at a value of US$20.9bn, representing 15% growth from the US$ 18.2bn reported at the end of 2013.

HEICO reports net income of US$27.6m for the first quarter of fiscal 2015

HEICO reported net income of US$27.6m, in the first quarter of fiscal 2015, up from US$27.5m in the first quarter of fiscal 2014. Net income in the first quarter of fiscal 2014 includes approximately US$2.6m, from a reduction in accrued contingent consideration related to a prior year acquisition. Operating income totaled US$46.4m in the first quarter of fiscal 2015 as compared to US$50.4m in the first quarter of fiscal 2014. The Company's consolidated operating margin was 17.3% and 18.9% in the first quarter of fiscal 2015 and 2014, respectively. The decrease in the first quarter of fiscal 2015 operating income and operating margin was principally attributed to a US$4m benefit realized in the first quarter of fiscal 2014 resulting from the aforementioned net reduction in accrued contingent consideration. Net sales increased by 1% to US$268.2m in the first quarter of fiscal 2015, as compared to US$266.8m in the first quarter of fiscal 2014.

Astronics Corporation reports 2014 fourth quarter sales of US$166.1m and net income of US$18.4m

Astronics Corporation, a leading provider of advanced technologies for the global aerospace, defense, consumer electronics and semiconduc-

tor industries, released that consolidated sales increased US$60.6m to US$166.1m, compared with the same period in the prior year. The 2014 fourth quarter included US$43.7m in incremental sales for acquired businesses. Organic sales increased US$16.9m, or 16.1%. Aerospace segment sales increased US$25.9m to US$128.6m and Test Systems segment sales increased US$34.7m to US$37.5m. Consolidated gross margin was 25.6% compared with 23.9% in the fourth quarter of 2013. Margins expanded on leverage achieved from increased organic sales volume and lower expense related to the fair value step-up of inventory from acquired businesses which was somewhat offset by higher engineering and development ("E&D") costs. Expense related to the fair value step-up of inventory from acquired businesses was US$0.8m and US$3.5m in the 2014 and 2013 fourth quarters, respectively. E&D costs were US$19.7m, which included US$3.8m for acquired businesses. E&D costs in the prior year's fourth quarter were US$14.3m.

Aircastle reports fourth quarter and full year 2014 results

Aircastle reported total revenues for the fourth quarter were US$238.3m, an increase of US$46.3m, or 24% from the previous year, driven by higher maintenance revenues of US$27.6m reflecting the early return of several aircraft on lease with Russia-based airlines and higher lease rentals of US$8.9m. Adjusted EBITDA for the fourth quarter was US$233.2m, up US$37.2m, or 19% from the fourth quarter of 2013, due primarily to higher total revenues, excluding amortization of net lease discounts and incentives, of US$38.3m. Adjusted net income for the quarter was US$80.1m, up US$25.2m or 46%, year over year. Total revenues for 2014 were US$818.6m, an increase of US$110.0m, up 16% from the previous year. The increase reflects higher lease rental and finance lease revenue of US$64.5m, higher maintenance revenue of US$19.7m and lower amortization of lease premiums, discounts and lease incentive amortization of US$26.2m. Adjusted EBITDA for the full year was US$792.3m, up US$75.1m or 10% versus 2013, reflecting higher total revenues excluding amortization of net lease discounts and lease incentives of US$83.7m, partially offset by lower gains from the sale of flight equipment of US$14.1m. Adjusted net income for the full year was US$167.6m compared to US$59.3m in 2013, an increase of US$108.4m.

AAR to sell Telair Cargo Group to TransDigm for $725m

AAR has agreed to sell its Telair Cargo Group to TransDigm for a purchase price of US$725m in cash, subject to adjustments. The Telair Cargo Group is comprised of Telair International, Telair U.S., and Nordisk Aviation Products. AAR will report its Telair Cargo Group as discontinued operations beginning in the third quarter of FY 2015 and the sale is expected to close in the fourth quarter ending May 31st, 2015, subject to regulatory approval. When the sale closes, AAR expects to report a pre-tax gain of approximately US$200 million after expenses and fees. AAR further announced its intention to sell its unprofitable Precision Systems Manufacturing business and will report it as a discontinued operation and record an impairment charge of approximately US$40m in the third quarter of FY 2015.

Other News

LEO TaxiBot at Frankfurt Airport *Photo: Lufthansa*

Following approval by the **European Aviation Safety Agency (EASA)**, **Lufthansa LEOS**, a subsidiary of **Lufthansa Technik AG**, has commenced operations with the innovative TaxiBot aircraft tractor, developed by **Israel Aerospace Industries (IAI)** with Lufthansa LEOS' extensive support and cooperation. After extensive testing, the TaxiBot will now be used in real flight operations at Frankfurt Airport. At a media event held at Frankfurt Airport on February 19th, the TaxiBot's towing procedures were demonstrated for local and international journalists, while taxiing a Lufthansa Boeing 737 to the take-off position. TaxiBot (NB) is a towbar-less 800-hp strong hybrid-electric aircraft tractor, controlled by the pilot and intended for towing aircraft between the gate and the runway with the aircraft's engines turned-off. Accordingly, a memorandum of understanding was signed between Lufthansa LEOS and IAI for wide body aircraft certification testing. The test phase will be performed using a Boeing 747-400 and is expected to be completed by the end of 2015.

AgustaWestland received approval of the **FlightSafety International Learning Centre** in Lafayette, Louisiana, USA as an AgustaWestland Authorised Training Centre. FlightSafety International has been providing AW139 Training since May, 2013. Courses for the popular AW139 intermediate helicopter delivered from the Learning Centre benefit from an AW139 Level D qualified Full Flight Simulator which features FlightSafety's electric motion and control loading technology and new VITAL 1100 visual system. The advanced VITAL 1100 visual system provides highly realistic visuals designed for comprehensive training scenarios. It is optimized for training low level flight operations, offers increased scene content, vastly improved weather features and enhanced levels of detail for optimum cueing. VITAL 1100 delivers the ability for helicopter pilots and crews to be completely immersed in all training requirements. The level D device is complemented by a comprehensive suite of courseware and training aids. The establishment of FlightSafety by AgustaWestland as an Authorised Training Centre represents the Company's commitment to strong training partnerships and to its expanding global support and training services.

More bang for the buck

Analysis by ***Keith Mwanalushi***

The North American heavy maintenance sector is the largest by global regions. Shifting customer demands and market dynamics are putting a new focus on the business by MRO providers. ***AviTrader MRO*** investigates.

North American market could see up to 5% annual growth rate for airframe heavy maintenance over the next decade. *Photo: Southwest Airlines*

According to market research reports published recently, the outlook for the North American market is for a 3% - 5% annual growth rate for airframe heavy maintenance over the next 8 to 10 years. The three distinctive groups are the main legacy carriers focusing mostly on in-house (at least for narrow body aircraft) maintenance, the new airline players are focusing on outsourcing MRO services, mainly to one MRO supplier and smaller airlines that are shopping around for their MRO services.

"The airframe MRO market in North America is in a reasonably healthy state, due in part to the improving health of the airlines in the region," declares Leonard Kazmerski, VP marketing and business development at HAECO Americas. "There has also been a transition of some wide body work from Asia back to the Western hemisphere as labour rates continue to approach parity. Additionally, there is a lot of continuing modification work coming onto the market, especially for interiors programmes and in-flight entertainment systems upgrades as airlines increasingly compete to retain passenger loyalty," Kazmerski highlights.


Kazmerski says some wide body work is coming back to the Western hemisphere. *Photo: HAECO Americas*

In terms of annual growth rates Donald Kamenz, VP for sales at Miami-based Commercial Jet sees the figure to be closer to 3% annual growth rate. "From our perspective, economic drivers like low fuel prices, continued economic recovery and the restrictions in new aircraft availability will contribute to airlines needing recurrent maintenance work on existing aircraft and even the reactivation of currently stored airplanes," says Kamenz.

In addition, Kamenz believes that the inherent capacity constraints of an airlines' in-house MRO results in a potential need to outsource maintenance for their existing aircraft in order to accommodate the newer models.

As Kazmerski observes wide body heavy maintenance checks will be a new opportunity for North American MROs. According to a 2014 report by Team SAI, twenty years ago there was a legitimate labour arbitrage play that yielded 30 to 40% savings by taking advantage of lower labour rates offered in Asia and the Middle East.

The Team SAI report suggests that if high quality is maintained with reliable turn times, North American MROs have an opportunity to repatriate a large share of this wide body work over the coming decade. To put this in perspective, as the report says, if North American MROs capture just half the work North American operators currently outsource abroad, that would represent an opportunity worth upwards of $100 million per year. In a mature market this represents significant growth opportunity for MROs willing to invest in wide body hangar facilities, equipment, and training.

The folks at Lufthansa Technik (LHT) say while observing the landscape of MRO services in North America of different aircraft types, one can see that chosen MRO solutions differ between wide body and narrow body aircraft. While wide body aircraft tended to be brought overseas for base maintenance work, the tendency for narrow

Over 1,100 of the current narrow body fleet will be replaced. *Photo: Bill Abbott, Wikimedia*

body aircraft was to be performed in-house. "In the last years this trend has turned and more and more maintenance work is coming 'home,' says a spokesman from Lufthansa Technik's overhaul distribution division.

It is expected, that the market forces influencing the sector in the US are quite similar to those influencing this sector worldwide, meaning MRO cost cutting is in the focus. Of course, politically motivated "bring work home" programmes should not be underestimated - one example is the US Government like Select USA.

In the commercial market, Matt Eaton SVP MRO marketing and sales at C&L Aviation Services foresees that the industry is heading into a period of expanding capacity and a shrinking market. He says most of the U.S domestic MROs have added capacity in the form of additional locations or hangars while the airlines are experiencing a period of fleet consolidation due to merger and acquisition activity. MROs that focus on the commercial airliner market can expect to experience increasing competitive pressure as they strive to fill this additional capacity with a diminishing demand.

"The regional market, will continue to generate activity and growth in primarily four areas: fleet integration and transition, including paint and interiors as large block of aircraft move about; IFE and interior modifications; on-going maintenance for new start up carriers; and end of life activities," says Eaton.

The demand by airlines for total support and bundled maintenance offerings is likely to continue, but cost is a key consideration when airlines choose a service. HAECO is increasingly offering modification services in conjunction with scheduled maintenance programmes as a way to optimise aircraft time on the ground. Kazmerski indicates that this bundling can deliver some benefits to customers through saved time and operations movements.

> "We have also recently signed a number of customers up to our power by the hour component maintenance programmes. We are listening to what our customers want and increasing our offerings accordingly."
>
> Matt Eaton, SVP MRO marketing and sales at C&L Aviation Services

"However, we go further in adding value by offering customers associated integration services, including full certification, through our HAECO Cabin Solutions unit. As an organisation delegation authorisation (ODA) provider, we are thus able to save the customer real time, cost and complexity as a single source provider for regularly scheduled check work, and support for complete modification programmes. Of course, we also have hangar facilities around the world, adding an additional dimension of flexibility to our competitive offering," Kazmerski tells.

C&L reacted early to the increasing airline preference for 'bundled maintenance' offerings and the company has expanded its portfolio of services accordingly according to Eaton. "We have also recently signed a number of customers up to our power by the hour component maintenance programmes. We are listening to what our customers want and increasing our offerings accordingly."

Ideally, efficiency gains in maintenance operations should translate into savings for aircraft operators. Taking this into account, this also means that performing maintenance for airlines over a longer period of time allows the likes of Commercial Jet to have a deeper and solid knowledge of the aircraft maintained and the aircraft operator's specific needs and likes.

"Working from two facilities, one in Miami, Florida and the other in Dothan, Alabama, Commercial Jet is able to offer competitive MRO services to suit aircraft operators and owners from all over North America and abroad," comments Donald Kamenz.

Lufthansa Technik is bringing its successful European formula to the Americas with its new location in Aguadilla, Puerto Rico. The German MRO agrees that while choosing locations and considering business cases, cost is one of the major factors taken into account.

However Lufthansa Technik reminds that the setup of a new facility or location is dependent on various factors and the cost level of a location can never be the one and only choice criterion. "Ensuring cost competitiveness is enforced by process optimisation and extensive realising of economies of scale potentials given by the size and experience of LHT. One location learns from the other six, and in turn supplies best practises to its network partners. Efficiency gains can thus

be multiplied in a very short timeframe," LHT states in a statement.

Additive manufacturing is expected to cut down the weight of future aircraft models. This will supposedly set challenges for the MRO industry. New technologies always present challenges until they are adopted. Commercial Jet sees opportunities in adaptive manufacturing and the development of 3D printing for applications in the MRO industry.

The HAECO Group has actually fully embraced additive manufacturing in several of their businesses. "For example, we are already using the technology in the production of our interiors products such as parts for our new Vector economy seat. We have also been exploring ways to implement the practice in our growing structures repair business, which supports work for our airframe customers," Kazmerski explains.

As the experts at C&L continue to study additive technology and how to adapt it to the business, they see initial efforts geared toward component and repair prototyping. "We'll be able to conceive a component or repair, create it per our design, test it for form and fit, and in some cases, function. The advantages presented by this technology are only just now being explored and promise the evolution of many benefits not yet conceived," Kamenz foretells.

Donald Kamenz VP Sales at Commercial Jet.

Industry expert's project that North American carriers will take delivery of about 3,700 new commercial aircraft in the next 10 years. The North American fleet mix is expected to favour narrow body growth at the expense of regional jets while the wide bodies' and turboprops' shares hold steady.

The regional jets passenger fleet is expected to decline over the next 10 years. *Photo: C&L Aviation*

Team SAI research shows that narrow bodies account for 53% of the passenger fleet today, a share that is expected to grow to 60% by 2024. There will be over 2,100 new deliveries over the period, as U.S. airlines ramp-up their fleet renewal. Over 1,100 of the current narrow body fleet will be replaced, principally the MD-80, 757, and A320.

The wide body passenger fleet should grow much more modestly, climbing by just 113 over the next ten years or so. Regional jets play a significant role in feeding the hubs of the U.S. majors. However, Team SAI reveals that their 29% share of the passenger fleet is expected to decline to 21% over ten years. The 30-40 seat types are already being phased out and the 50-seater fleet will continue to decline.

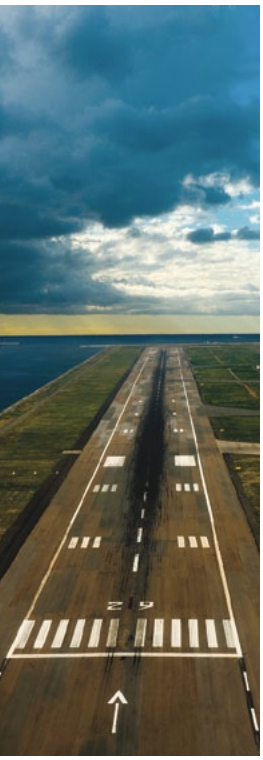
New aircraft are engineered to require less heavy maintenance and the newer fleets will not require significant modification in the early part of their lives. "Where we see maintenance requirements for the commercial fleet is fleet transition activity as some of the older planes transition to second and third level operators as well as end of life needs as the rate of airframe retirement continues to accelerate," states Kamenz from C&L.

At Commercial Jet, in addition to extending the existing life of current aircraft, the company is also interested in supporting an operator's new fleet. That being said the addition of new aircraft will lead to outsourcing maintenance most likely geared to an airline's existing aircraft, many of which will remain in their fleet to attend to the growth in passenger travel.

Kazmerski adds that while newer aircraft certainly present improvements that will drive less frequent scheduled maintenance events, the types of work that will need to be performed on these fleets will be more complex.

He said advanced materials and technology are already driving the need for new skills and experience in places where it never existed before. "For example, how some types of new materials might show fatigue over time and how that can be most effectively detected and addressed in the field are still the subject of ongoing assessment and development. The savvy providers that make investments to be able to support the new needs will be successful in this new chapter for our industry," Kazmerski ends.

Matt Eaton - C&L reacted early to the increasing airline preference for bundled maintenance.



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Why "& Partners"?

Our business was originally established as a joint venture between Rolls-Royce and a small group of financial institutions. Our current shareholders are Rolls-Royce and GATX Corporation. We have kept the "& Partners" suffix as our history of partner ownership has shaped our approach to business.

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We support over fifty customers around the world, from established flag carriers to the big airlines of the future and the importance of long-term relationships with our customers is absolutely fundamental to us. Our customers' aspirations are shared by us and we work in partnership with them to turn those aspirations into reality. We have recently published some case studies on our website that explain how we work with our customers (www.rrpf-leasing.com/insight.aspx). One of our customers described their experience with us as, "We felt throughout the entire process that we were dealing with a partner and not a financial counter-party… we are very happy where we have come over the last 13 years and we look forward to future opportunities together."

Providing flexible solutions

Bobby Janagan, Vice President & General Manager, Rolls-Royce & Partners Finance

We provide customers with individually tailored solutions to meet their specific engine support needs. For example, if you are purchasing a new spare engine, we can provide, via a sale and lease-back transaction, a cost effective alternative to bank debt. For customers taking used aircraft or looking for top-up spare engine support, we can provide engines and supporting components through operating lease arrangements. We can also provide used engines on a straight sale, finance lease, or exchange basis for those customers that would prefer to own assets. All of our solutions can be seamlessly integrated with TotalCare® or other maintenance services provided by Rolls-Royce.

Innovating for the future

We recently announced a ground breaking transaction with DVB Bank. RRPF and DVB completed a sale and lease-back transaction to finance V2500-A5 engines installed on five A320-200 aircraft. The aircraft were subject to existing leases purchased from Mitsui & Co US and were all on lease in the Americas region. This transaction showed that we are able to develop new products to support our customers.

In an ideal world, airlines only want spare engines on a just-in-time basis to cover engine maintenance events. Slow lease transition speeds are preventing us reaching this ideal. However, in the short term we think that if aircraft managers and spare engine service providers worked closer together by sharing data on evolving coverage requirements, then costs can be reduced and efficiencies realised. This will be easier to implement with narrow-body aircraft due to spread of operators and the liquidity of the engine types. This is something we are looking at improving in the near term.

We firmly believe that our approach of working in partnership with our customers will allow us to spearhead the introduction of further innovations in the future.

Tailored solutions to meet specific engine support needs. *Photo: Rolls-Royce & Partners*

Aviation MRO in Africa needs overhaul

Despite the fact that aviation creates around 6.7 million jobs and $6.8B for African GDP, it still remains an area for concern. There are a lot of factors to blame for such a performance, including limited technology, poor policing, cumbersome airport fees and taxes on jet fuel (which are about 20% higher than elsewhere on the globe), as well as the lack of political will. Nevertheless, in order to start moving forward, the region has to properly address its MRO capabilities in both short and long term perspectives.

Managing AOG situations is difficult in some parts of Africa. *Photo: FL Technics*

Currently African commercial aviation is a market with less than 400 aircraft. Nevertheless, one has to keep in mind that it has a huge population and major natural resources, allowing African economies to grow more than 5% in 2014 alone. Based on that, experts forecast that with the middle class on the rise over the next few decades the industry can achieve growth comparable to that of the Middle East, given, of course, it is managed correctly. At the same time, however, the continent's safety record is still about eight times worse than that of any other of the five continents in the world, which makes improvements in the area a top priority.

"Political interference with technical aviation is widely regarded as one of the principal threats to aviation safety, be it in developed or less-developed markets. Therefore, to achieve the growth objectives, it is vital for African states to have effective and autonomous civil aviation authorities. Another challenge is increasing the pool of skilled and qualified maintenance labour, especially since more and more new aircraft models are introduced to replace the old ones. Adding up to the issue is the brain drain affecting the future of African aviation. And then there are also numerous component logistics issues to address," comments Aldas Juronis, the Head of FL Technics Components and Materials Sales Department.

Pressing challenges to developing appropriate aircraft maintenance capabilities in Africa include huge distances, sparse infrastructure and transferring parts between countries, especially since there are operations in remote Africa. Having tools and parts shipped into some areas is also very difficult because of many borders and different governmental policies, resulting in various customs obstacles. For instance, it may take several days to clear African customs, which naturally adds significantly to maintenance-related downtime during AOG situations. Meanwhile, Kenya charges a non-refundable railway tax of 17%, which has even resulted in a practice of shipping components to other areas to be installed.

"Currently much of the main drivers of African aviation MRO costs are component-related, creating many challenges, long delays and additional expenses. One of the possible solutions to this problem could be building up stock levels to mitigate the delays, enabling airlines to solve AOG situations rapidly and get the customers flying with minimal downtime," states Juronis.

"At the same time, continuous challenges provide reasons to welcome new companies that might bring new solutions to old issues through strong relationships and constant examination of shipping problems. Much of these can be supplied by third-party providers that want to expand their operations on the continent. In any case, currently the African aviation industry requires immense investments as well as a highly innovative and creative approach in order to tackle its problems and realize its full potential," Juronis says.

Source: Avia Solutions Group

Additive repair technologies

Analysis by Dr Vivek Saxena, *VP and Leader, Operations and Supply Chain* and Peter Zimm, *Principal – ICF Aviation.*

Additive manufacturing (AM) has been a hot topic of late. Long used to make production polymer parts for aircraft (the first parts appeared in the late 1990's and the flying population numbers in the tens of thousands), the application of additive to make metal parts has gestated to the point that utilising AM to make prototypes and tooling is well accepted. Visionaries and practitioners alike have turned their sights to the next stage – using additive for volume production. By now, everyone is probably familiar with the various announcements and presentations made by aerospace OEMs and Tier -1s like GE, Pratt & Whitney, Airbus, Boeing, Moog, GKN and MTU.

Additive manufacturing is also being used for aftermarket applications. In December 2013, BAE began producing protective covers for cockpit radios and guards for power take-off shafts with AM to sustain RAF Tornados. The Royal Navy also had out of production wire harness clips for Tornados made with AM. In February 2014, Airbus grew its first AM component – a small plastic crew seat panel – which flew on a customer's A310 jetliner. This was the first product made as part of an Airbus initiative to provide "on demand" spare parts to its operators. These early examples are not just about part availability – BAE expects to create nearly $500K in annual maintenance savings for the Royal Air Force on their Tornado fleet. These same additive technologies could be used to grow features on parts and to perform additive repairs as well. We believe additive is poised to penetrate the aftermarket repair world in the near term.

To some in manufacturing, additive manufacturing represents the 'next industrial revolution' while others point to the history of stereolithography as evidence that AM is simply 'old wine in a new bottle'. One comes across similar arguments in the area of aerospace AM repair, but with rather increased vehemence. Plasma deposition of abradables for restoring Outer Air Seal systems and even the substrate material for repairing rotating air foils in aircraft engines to restore dimensions have been integral to the existing hot section blade repair technologies for decades. These repair processes could justifiably be called one of the earliest AM technologies which resulted in aerospace parts that have actually been flying.

So what's new? One difference is that while early technologies, turbine tip repair for instance, relied entirely on 'home grown' (read 'Corporate Labs' of the yore) equipment and methods and consequently gave OEMs tremendous competitive advantage, the availability of the new wave of AM equipment like LENS (Laser Engineered Net Shaping) machines threatens to disrupt the competitive landscape. Mastering a consistent repair process, quality control and qualifying the repaired part are no easy tasks. However, the availability of 'off the shelf' equipment will undoubtedly shorten the process development time-scales and will open the doors for innovative players into new applications like high-value blisk repairs.

There are a few other tantalising possibilities offered by AM methods to the MRO community. Supersonic Particle Deposition (SPD, also referred to as cold spray) is a technology in which metal or plastic powder particles in a supersonic jet of compressed gas impact a solid surface with sufficient energy to cause plastic deformation and bonding with the underlying material . Australian MRO firm Rosebank Engineering and Moog, a controls system OEM, have offered cold spray technology for repairs for parts with surface damage or corrosion that would otherwise need expensive replacement. In a recent MRO industry panel on AM repair methods chaired by one of the authors (PZ) of this article, cold spray was discussed with much enthusiasm despite the fact that ASTM (American Society for Testing and Materials) does not recognise cold spray as strictly an AM method. Being a line-of-sight process, this technology has its limitations to external surface applications but in some instances it can be applied in-situ, without having to dis-assemble with significant lead time and cost benefits. First in service application is being implemented on a Royal Australian Navy Seahawk helicopter main transmission module. One can imagine the possibilities once this repair method matures for skins and skin bonded joints.

Sceptics will counter that metal part additive manufacturing is yet to be proven in a production environment, so how can it leap into the aftermarket, much less aftermarket repairs. Furthermore, aftermarket applications can't make use of all of additive's benefits, especially some of its most valuable ones – the ability to realize designs that subtractive manufacturing cannot make, weight reduction, part consolidation, and performance enhancement. Lastly, and perhaps most importantly, additive repairs face the same certification and qualification challenges that likely hamper the adoption of additive for directly manufactured new parts.


Peter Zimm, Principal
ICF Aviation

But for aftermarket repairs, the obverses of these objections hold truer. For example, the restrictions on aftermarket parts and repairs reduce the number of variables that can be changed (materials stay the same, must conform to form, fit, and function, etc.). Furthermore, from a certification perspective, repairs have clear certification procedures; not to mention a lot of history and experience substantiating repairs involving the selective addition of material, frequently with heat, to a given surface to bring it into specified dimensions. And the low volume nature of repairs is well fitted to additive's capability. If anything, repair might be the most virtuous application of additive manufacturing technologies – one in which new offerings can be developed and approved faster than their new part cousins. Lastly, additive repair is likely to be advanced by more innovative and smaller firms than AM for new direct parts. Thus far, the latter, which requires a lot more substantiation for microstructure and understanding of failure modes, has been mostly conducted by OEMs and Tier 1s. In contrast, the limited scope of repair means smaller firms can afford to develop and substantiate them.

The additive repair market is small today but, as a fraction of total repair market, it is much bigger than additive part manufacturing is of the total parts market. We estimate that AM-associated repair methods account for about 5% of the aerospace repair market and are predominantly in the engine systems. Contrast this with about 0.1% AM part production in the $180 billion worth of overall aerospace production currently. Relatively lower barriers to qualification may play a role but this is mainly due to the fact that many existing repairs for turbine blades, combustor liners and spray repairs are generically additive. As newer technologies like cold spray mature and on demand spares for sunset platforms become more common, we expect the value derived from additive methods to skyrocket in the MRO industry. We can safely predict that AM equipment will be as ubiquitous in MRO shops in the foreseeable future as are the welders today.

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Scott Meyer
Photo: Comlux America

Comlux America, the Completion and Services center of the Comlux Group based in Indianapolis IN, announced the appointment of **Scott Meyer** as the new CEO. Scott currently serves as the COO for Comlux America and he will take on this new role beginning the 1st of April 2015. Scott Meyer started his career in aviation over 25 years ago, with a focus on VIP interior modifications. Scott has been with Comlux America almost since the inception of the company. He started his career at Comlux in 2009 and he was the 2nd management individual recruited during the establishment of the company.

PEMCO World Air Services has undergone an internal corporate restructuring in an effort to improve operational efficiencies and continue the company's growth and success. PEMCO World Air Services (PEMCO) has appointed **Pastor Lopez** as CEO of the Tampa, Florida-based aviation company. Bringing nearly 30 years of industry experience, Lopez is responsible for the growth and sustainability of PEMCO's leading maintenance and conversion operations.

Lockheed Martin has appointed **Rodney A. Makoske**, to senior vice president, Corporate Engineering, Technology, and Operations and a corporate officer, and **Dana (Keoki) Jackson** as vice president and chief technology officer (CTO). Both appointments are effective immediately and follow the retirement of **Ray Johnson** on February 1st, 2015.

Marion C. Blakey has been appointed to become President and Chief Executive Officer of Rolls-Royce North America and chair of the Rolls-Royce North America Board of Directors, replacing **James M. Guyette** who will be retiring in May. Ms. Blakey will leave her position as President and Chief Executive Officer of the Aerospace Industries Association (AIA) where she has served nearly eight years. At AIA, she's been an authoritative and influential voice for the aerospace and defense industry, representing approximately 340 of the industry's leading manufacturers. She has also played a leading role in promoting the export of civil and defense aviation products, and supported the priorities of America's thousands of suppliers to aerospace and defense programs.

Marion C. Blakey
Photo: Rolls-Royce