

## 3D PRINTING

How far will it go?

Company Profile  
Blackbird

MRO News  
from around the world

People on the Move  
latest appointments

ICF Analysis 



# Embracing new technologies

Oliver Wyman's recent MRO survey that looks at how new aviation technologies could change the MRO competitive landscape makes for some interesting reading. The survey investigates the business impact of innovation and new technologies coming on line.

The survey says in order to compete as technology changes, MRO providers will have to overcome their own reluctance to innovate. Seventy-six percent of survey respondents said their organisations have clear visions and growth strategies, but most gave their companies failing grades on the ability to translate identified opportunities into executed operational plans.

In this edition we look closer at how MRO's are responding to 3D printing (additive manufacturing). The technology is not necessarily new as players such as GE Aviation have been using such techniques for many years. What's new however is the flexibility in which the technology can be applied. The cover story examines what influence 3D printing has on MRO procedures and what impact it will have in the future.

The survey respondents believe that new repair technologies (58%) and predictive maintenance (48%) have the most potential to upset current market dynamics. Of lesser concern are 'composite repair capabilities' (26%) and 'live main-

tenance through wearable and mobile tech manuals' (26%). The lowest concern comes from 3D printing, which was listed by 13% - our cover story examines why the industry has been hesitant to embrace this technology.

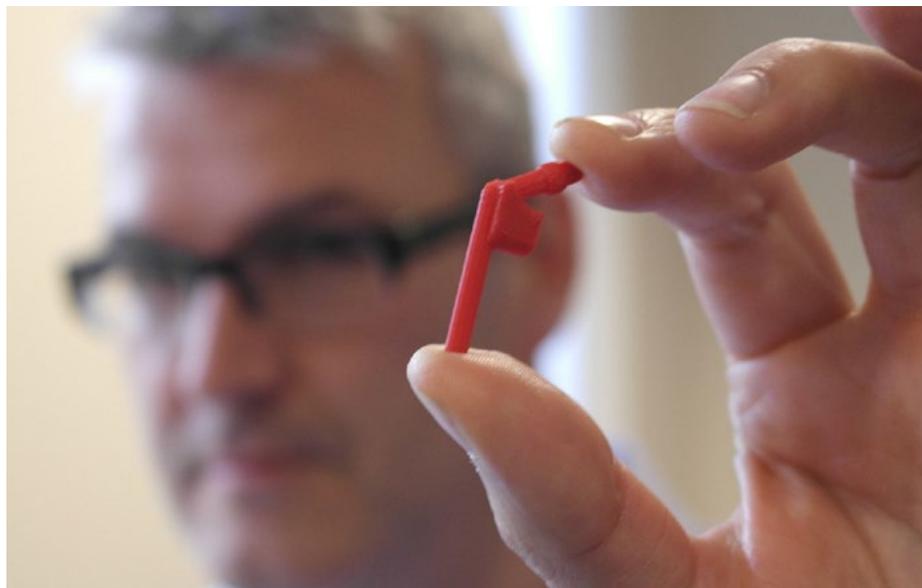
Elsewhere in this edition, Lee Burgess, head of engineering at Monarch Aircraft Engineering Limited (MAEL) speaks to *AviTrader MRO* about the company's operations and prospects, from new FAA approvals to expanding capabilities.

Happy Reading!

Keith Mwanalushi  
Editor

Following the article published in the July 2015 edition of *AviTrader MRO* titled "The long march of the Middle East titans" ICF International would like to correctly state that:

*"While Etihad, Mubadala, and SRT all share the same owner – the government of Abu Dhabi, **Etihad is NOT owned by Mubadala, while SRT is.** Therefore SRT and Etihad are not sister companies."*



3D printed BAe 146 window breather pipe.

Photo: BAE Systems

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AVITRADER

# MRO

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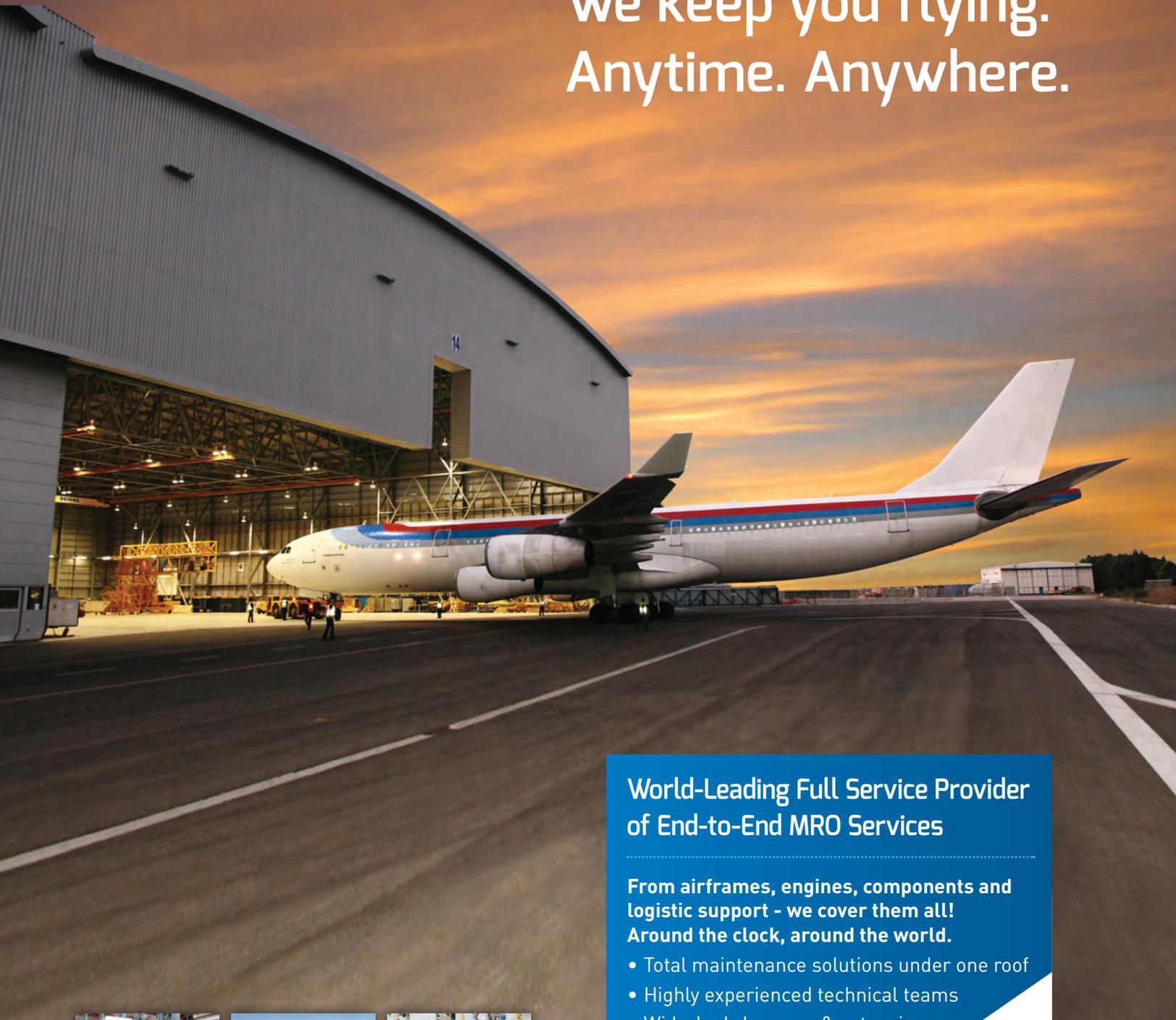
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Vector Aerospace launches VMAX support program for the Pratt & Whitney Canada (P&WC) JT15D turbofan  
Photo: Vector Aerospace

### Vector Aerospace launches VMAX program for JT15D engine operators

Vector Aerospace Corporation announced the launch of the VMAX support program for the Pratt & Whitney Canada (P&WC) JT15D turbofan. The VMAX program is focused on keeping operators flying, and combines the responsive, high-quality support provided by Vector Aerospace's fully-authorized JT15D Designated Overhaul Facility (DOF) and global field service team with a convenient pay-per-hour engine service plan. Owners of engines enrolled in the VMAX program receive worldwide coverage through a dedicated 24/7 customer support line and regular monthly hours reporting. Vector's JT15D VMAX program is the evolution for JT15D customer support in servicing engines in this market. There are approximately 5,250 JT15D engines in service today, major applications for the type including the Cessna Citation I / II / V / Ultra series and the Hawker 400 / Beechjet family. As a further demonstration of its commitment to operators of the JT15D, Vector has also extended its DOF license for the engine by a further ten years, to 2032. This undertaking ensures that VMAX customers can be confident of benefiting from Vector's long-term support of the JT15D powerplant.

### HAECO Cabin Solutions announces new facility expansion in North Carolina

HAECO Cabin Solutions will expand its design engineering and interiors product manufactur-

ing capacity in a new, 259,000 ft<sup>2</sup> facility in High Point, North Carolina. The building is in close proximity to HAECO Americas' headquarters in Greensboro. Renovations will start in 2015 and the facility is expected to be operational in the first quarter of 2016. HAECO is experiencing increased demand for the company's engineering capabilities, such as airline fleet retrofit programs, as well as interiors products like the company's new Vector-Y passenger seats and FeatherWeight galleys and lavatories. Up to 400 employees are expected to work at the new facility, including a mix of new hires and transfers from other existing HAECO locations.

### Boeing to support British Airways 787 Dreamliners with component services

Boeing has signed a contract with British Airways to provide component services for its 787 Dreamliner fleet. Under the 12-year agreement, Boeing will supply British Airways 787s with a carefully selected pool of high-value parts, enabling the airline to reduce its inventory management costs while improving component availability. Component Services, part of Boeing GoldCare, offers solutions for airlines' materials, engineering and maintenance needs. British Airways currently has eight 787s with 34 more on order, adding an additional 42 aircraft to Boeing's growing component services customer base.

### SunExpress Airlines selects Honeywell to maximize safety and efficiency of new Boeing 737 fleet

Honeywell Aerospace has signed a contract with Turkish airline SunExpress to supply the company's latest cockpit technologies for its first delivery of newly purchased Boeing 737-800 airplanes. Honeywell will provide SunExpress with cockpit avionics, including the IntuVue 3-D Weather Radar and the SmartTraffic Traffic Collision Avoidance System. With these technologies, SunExpress will be able to increase operational efficiency and maintain compliance with current and future industry safety regulations.

### MIAT Mongolian Airlines confirms eight year power-by-the-hour contract with AJW Aviation

MIAT Mongolian Airlines, the national flag carrier based in Ulaanbataar, has chosen AJW Aviation to provide full power-by-the-hour services for three

Boeing 737NG aircraft. This eight year agreement, which commences on August 1st, sees AJW Group further expand its support of MIAT alongside its existing PBH programme for the airline's Boeing 767s. MIAT will have access to AJW's extensive stock of Boeing spares conveniently sited for their route network across Europe, Central and East Asia.

### Airbus' Runway Overrun Prevention System (ROPS) certified by EASA on A330 Family

Airbus has achieved EASA certification of its innovative Runway Overrun Prevention System (ROPS) technology on A330 Family aircraft. This on-board cockpit technology, which Airbus has pioneered over several years, is now certified and available on all Airbus Families. ROPS is an alerting system which reduces exposure to runway overrun risk, and if necessary, provides active protection. Korean Air will become the first A330 operator to implement ROPS on its A330s in service in the coming months. This EASA certification of ROPS on the A330 marks a key milestone in making ROPS available for line-fit and retrofit to all Airbus models. ROPS was first approved by the European Aviation Safety Agency (EASA) on the A380 in October 2009 and to date is currently in service or ordered on most of the A380 fleet. ROPS is also part of the A350 XWB's basic configuration, and in August 2013 was also certified for the A320 Family.

### Hangar expansion construction underway for Lufthansa Technik Philippines

Lufthansa Technik Philippines' (LTP) hangar expansion is on track, six months after the Manila-based aircraft maintenance, repair, and overhaul (MRO) provider broke ground in January to extend its main hangar. The construction expands two existing bays equipped with versatile docking systems that can accommodate current widebodies and newer models for the Airbus A350, Boeing 777-9X, and 787. This will also be LTP's second line for A380 base maintenance and its entry into Boeing 777 base maintenance. The development is expected to expand the company's yearly capacity by 200,000 manhours. In preparation for LTP's new Boeing 777 base maintenance capability and increased A380 capacity, extensive training for its highly qualified production staff is ongoing, in partnership with Lufthansa Technical Training Philippines. LTP's hangar extension will be inaugurated this November, as it welcomes an Airbus A380 layover at the beginning of the month. The company's Boeing 777 base maintenance capability will be available in the first half of 2016.



Lufthansa Technik starts operations in Puerto Rico with first C-check for an Airbus A320 from US-carrier Spirit Airlines  
Photo: Lufthansa Technik

### Lufthansa Technik Puerto Rico starts operations

On July 21st, Lufthansa Technik's new facility in Aguadilla, Puerto Rico has started operations with its first overhaul line on time. Just 11 months after ground-breaking in August 2014 the first Airbus A320 from US-carrier Spirit Airlines arrived for a C-Check. Lufthansa Technik Puerto Rico (LTPR) is FAA Part 145 and EASA Part 145 approved. Initial customers are Airbus A320 family aircraft operators, Spirit Airlines and JetBlue Airways, from the Americas. A second overhaul line is planned to be operational in November, followed by three more lines until early 2017 to include Boeing 737 by then. Currently, about 140 highly qualified employees have been trained and are working for LTPR. It is planned to grow up to a workforce of 400 in the next 2 years. The

facility extends over a total area of 215,000 ft<sup>2</sup>. In its final configuration it will offer five lines for base and heavy maintenance checks (C-, IL- and D-checks), along with other maintenance work on narrow body aircraft. By using state-of-the-art technologies it is even possible to paint aircraft in the hangar while overhaul work is being conducted in parallel.

### Orbital ATK and Airbus finalize agreement on A350-1000 variant

Orbital ATK has finalized an agreement with Airbus to expand its current contract to include the manufacture of composite stringers and frames on the -1000 variant of the A350 program, adding to the work already being

performed on the A350 program. This agreement builds on Orbital ATK's valuable working relationship with Airbus and its partners. The Aerospace Structures Division of Orbital ATK's Flight Systems Group is executing the A350 program at its state-of-the-art Aircraft Commercial Center of Excellence facility in Clearfield, Utah. Orbital ATK is currently producing composite stringers and frames for the A350-900 and has successfully delivered more than 44,000 parts since the inception of the program.

### Boeing Services to support Oman Air 787 Dreamliner introduction

Oman Air has contracted Boeing Services to support the upcoming entry into service of the airline's 787 Dreamliners and to ensure ongoing efficiency and cost savings for its fleet. Boeing will support Oman Air's 787s with its Component Services (formerly Rotables Exchange) program, Loadable Software Airplane Parts service and Airplane Health Management. Together, these services will help Oman Air minimize the time and cost of maintenance while increasing airplane availability. With the Component Services program, Oman Air will have access to a Boeing-managed, dedicated pool of high-value, mission-critical parts, enabling the airline to greatly reduce their inventory management costs while improving component availability. Through the Loadable Software Airplane Parts service, Boeing will handle software configuration and management tasks associated with operating the 787. Airplane Health Management will allow Oman Air to minimize maintenance delays and schedule disruptions by continuously monitoring airplane performance while the airplane is in flight, notifying ground crews in advance of potential maintenance issues.

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## Lots of big announcements from Rolls-Royce throughout the month

### Rolls-Royce and Hispano-Suiza (Safran) create 'Aero Gearbox International'

Rolls-Royce and Hispano-Suiza (Safran) have named their joint venture Aero Gearbox International and announced plans to construct a new production plant in Poland. The news follows the signing of a final agreement, on 24th October 2014, to create a jointly-owned company that will design, develop, produce and support accessory drive trains (ADTs) for all of Rolls-Royce's future civil aircraft engines. The new venture will capitalise on its parent companies' combined experience and expertise, encompassing the capabilities of Hispano-Suiza in the design and production of accessory drive trains, and the engine design and propulsion system integration skills of Rolls-Royce. Based on an initial exclusive 25-year contract, Aero Gearbox International will cover the entire range of civil aircraft, from business jets to widebody commercial jets. Accessory drive trains, sometimes referred to as accessory gearboxes, are a critical component of a gas turbine engine, harnessing its power to drive systems and accessories such as fuel pumps, hydraulic pumps and electrical generators. The accessory drive train for the new Trent 7000 will be one of Aero Gearbox International's first products. Rolls-Royce and Hispano-Suiza will manage Aero Gearbox International's operations. The joint venture will initially have a total of 60 employees from the two parent companies spread across Colombes (near Paris, France), Derby (UK) and Dahlwitz (Germany). It is headquartered at Hispano-Suiza's site in Colombes. The construction of a new production plant will start at the end of 2015. It will be located in the Podkarpackie Province in southeast Poland.

### Rolls-Royce appoints HAECO Group as Asia Pacific's first on-wing service provider

Rolls-Royce has appointed HAECO Group as the first authorised on-wing services provider in the Asia Pacific region. On-wing services are jointly provided by HAECO Hong Kong and Hong Kong Aero Engine

Services Limited ("HAESL"), and currently cover Rolls-Royce engine models RB211, Trent 500, Trent 700 and Trent 800 as well as the IAE V2500. The HAECO Group plans to extend on-wing services to the Trent 900, Trent 1000 and Trent XWB engine models.

### Rolls-Royce signs US\$580m (£340m) TotalCare engine support agreement with Vietnam Airlines

Rolls-Royce has won a US\$580m (£340 million) TotalCare long-term engine support contract with Vietnam Airlines for Trent XWB engines that will power 14 Airbus A350 XWB aircraft. The contract was signed on July 29th, at the Government Office in Hanoi in the presence of Vietnam's Prime Minister Nguyen Tan Dung and UK Prime Minister David Cameron, who is visiting the country as part of a trade mission to South East Asia. The signing comes just weeks after Vietnam Airlines became the second airline in the world to operate the Airbus A350 XWB.

### Rolls-Royce to invest up to £60m in Inchinnan

Rolls-Royce announced plans to invest up to £60m in its facility in Inchinnan, Renfrewshire, creating a new Centre of Competence (CoC) for the manufacture of aerofoils and a new location for the manufacture of mainline engine shafts. The new CoC will manufacture an extensive range of aerofoils, including turbine and compressor components, for Rolls-Royce engines that are no longer in high volume production, such as the Adour and BR715. This requires a flexible workforce with a high degree of specialist knowledge. "The new location for the manufacture of mainline shafts will produce components that sit in the core of all Rolls-Royce aero engines. The new location for the manufacture of shafts will provide Rolls-Royce with capacity needed to deliver on our multi-billion pound order book. It complements our existing facility in Derby and capacity in our external supply chain," said Mike Mosley, Rolls-Royce, Chief Operating Officer – Supply Chain. This invest-

ment will potentially mitigate the impact of the job reductions announced earlier this year in Inchinnan as part of the Aerospace restructuring programme.

### Rolls-Royce TotalCare services worth US\$1.3bn selected by Saudi Arabian Airlines

Rolls-Royce has been selected by SAUDIA, the national carrier of Saudi Arabia to provide long-term TotalCare engine service support, worth US\$1.3bn, for 20 Airbus A330 Regional aircraft. The Trent 700 is the market leader on the A330 with more than 60% of new orders over the last three years. The Trent 700 now accounts for 90% of A330 freighters in service and on order. The airline will operate the 20 aircraft in addition to the 12 A330s currently in service, also powered by the Trent 700.

### Rolls-Royce joins with ITP for UltraFan research programme

Rolls-Royce is to work with ITP to support a €43m research programme to test Intermediate Pressure (IP) turbine technologies that will go into its future engine design, UltraFan. UltraFan, which will be available for service from 2025, will offer at least 25% improvement in fuel burn and emissions compared with first generation Rolls-Royce Trent engines. ITP will develop and validate intermediate pressure turbine and rear structure capabilities for the UltraFan engine demonstrator including design, development, testing and manufacture. The IP turbine programme, which is receiving €23.5m of its total funding from the EU, is part of the wider EU Clean Sky 2 initiative. The remainder of the funding will come from ITP. Clean Sky 2 runs until end 2023. It is a public/private Joint Technology Initiative that brings together Europe's industrial aeronautics leaders, public research organisations and SMEs to develop and demonstrate breakthrough technologies for the civil aerospace market, reducing emissions and noise and securing the continued competitiveness of the European aviation industry.

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WHAT IT TAKES TO FLY.



OEMServices opens new service center in Paris CDG

Photo: OEMServices

### OEMServices opens new service center in Paris CDG

OEMServices has celebrated the official opening of its new service center and headquarters. Connected to Roissy CDG, this new platform provides 70,000 ft<sup>2</sup> dedicated to OEMServices' customers. The service center hosts OEMServices' operations (AOG Desk and Customer Support 24/7) and storage of aircraft parts. The platform deals with operations dedicated to 50 OEM partners and customers. Open since the end of 2014, this center is a strategic step in OEMServices' expansion, with additional land reserved which will permit a further 30% extension of premises.

### RTI International Metals to supply titanium structural parts for Airbus A350-1000

RTI International Metals has been selected to provide finished titanium structural parts by Airbus for its new A350-1000 aircraft program. The award from Airbus – which represents its first procurement of RTI parts manufactured entirely by RTI's vertically integrated supply chain – calls for RTI to supply two final-machined structural titanium fuselage parts for the Airbus A350-1000 aircraft model. Work to be performed by RTI includes providing titanium mill products, as well as extruding, forming, final machining and managing external suppliers. A portion of the extrusion, forming and machining will be performed by business units acquired by RTI over the last three years, as part of the implementation and build-out of RTI's vertically integrated supply chain. These facilities include

RTI Advanced Forming and RTI Extrusions Europe, both located in The United Kingdom.

### EVA orders GE90-powered Boeing 777 Freighter aircraft with OnPoint agreement

EVA Airways confirmed an order for five GE90-115B-powered Boeing 777 Freighter and signed a 12-year OnPoint solution agreement for the maintenance, repair and overhaul that covers these GE90 engines. The engine order and OnPoint solution agreement are valued at more than US\$750m at list price over the life of the agreement. Aircraft delivery will begin in 2017.

### Liebherr LAMC Aviation (Changsha) produces and ships first landing gear components

Liebherr LAMC Aviation (Changsha), the Joint Venture of Liebherr-Aerospace Lindenberg GmbH, Germany and AVIC's subsidiary Landing Gear Advanced Manufacturing (LAMC), China, has shipped its first consignment of landing gear components to Liebherr-Aerospace's OEM facility in Lindenberg (Germany). The first program completely managed by the Joint Venture is the landing gear system of COMAC's C919 aircraft. As the Joint Venture develops further, it will be given responsibility for other aircraft programs. Liebherr LAMC Aviation (Changsha) was established in 2011 to develop and manufacture landing gear systems for the Chinese aviation industry as well as the international aviation market.

### Pratt & Whitney holds ceremonial groundbreaking for global headquarters and engineering facility

Pratt & Whitney held a ceremonial groundbreaking on July 16th for its new state-of-the-art 425,000-square-foot building that will serve as the company's global headquarters and world-class engineering facility. Construction work, which is supported in part by the 2014 Connecticut Aerospace Reinvestment Act, will begin later this year and is scheduled to be completed in late 2017. The ceremony was held exactly 86 years to the day that ground was broken for construction of the company's current East Hartford campus, which remains its global headquarters



Nathan G. Patch, grandson of Pratt & Whitney founder Frederick Rentschler (middle), joined company leaders and state and local government officials in reenacting the ceremonial 1929 groundbreaking  
Photo: P&W



Magnetic MRO opens painting hangar in Tallinn

Photo: MMRO

### Magnetic MRO opens painting hangar

Total technical care organization Magnetic MRO (MMRO) enlarged its services portfolio by opening full aircraft painting capability in their Tallinn headquarters. MMRO commenced its first painting project already in July, with painting slots reservation open for the winter maintenance season. The hangar has the capability to offer services to all narrow-body aircraft including Airbus A320 family, Boeing 737 CL/NG,

Embraer ERJ, Bombardier CRJ, ATRs and others. In the near future capabilities will broaden to high quality, high gloss special painting for business jets and small aircraft painting services. MMRO's 2725m<sup>2</sup> facility is equipped with the latest electrostatic spray, ventilation systems as well as LED lighting systems. The Sherwin-Williams painting system from USA will be a preferred choice, but appliances from other manufacturers will be included to meet all customers' requirements.

### CTS overhauls 100th CF6 engine

CTS Engines, a leading independent provider of jet engine maintenance services, has completed its 100th full overhaul on a GE CF6 series engine. The engine, a CF6-80A owned by DHL and operated by Atlas Air Worldwide Holdings, also represented the 17th completed CF6 engine fully overhauled by CTS to date in 2015.

### GA Innovation China imports first-ever commercial aircraft into Mainland China for disassembly

GA Innovation China (GAIC), a joint venture between GA Telesis and Air China, has announced the import and delivery of the first-ever aircraft from overseas for teardown and parts redistribution in mainland China. Tianjin HAITE High Tech Co, has been contracted by GAIC for disassembly operations on the Boeing 767-300. Upon completion, GAIC will provide aftermarket component support for the Chinese and Asian markets. This acquisition marks another historic milestone for GAIC, following the company's completion of the first-ever aircraft disassembly and parts redistribution program in China in 2013. The new teardown project supports GAIC's initiative to introduce foreign aircraft for disassembly to the Chinese market, in order to help airlines reduce maintenance and operating costs for their aircraft.

## Finance News

### Berkshire Hathaway to acquire Precision Castparts for US\$235 per share in cash

The boards of directors of Berkshire Hathaway and Precision Castparts have unanimously approved a definitive agreement for Berkshire Hathaway to acquire, for US\$235 per share in cash, all outstanding PCC shares. The transaction is valued at approximately US\$37.2bn, including outstanding PCC net debt. "I've admired PCC's operation for a long time. For good reasons, it is the supplier of choice for the world's aerospace industry, one of the largest sources of American exports. Berkshire's Board of Directors is proud that PCC will be joining Berkshire," said Warren E. Buffett, Berkshire Hathaway chairman and chief executive officer. The transaction requires approval by a majority of PCC's outstanding shares. Closing is expected to occur during the first quarter of calendar 2016, subject to customary closing conditions, including clearance under the Hart-Scott-Rodino Act and competition clearance in certain foreign jurisdictions. PCC will continue to do business around the world un-

der the Precision Castparts name and maintain its headquarters in Portland, Oregon.

### TAT Technologies intends to acquire Chromalloy Israel

TAT Technology, a leading provider of services and products for the commercial and military aerospace and ground defense industries, has entered into a definitive agreement to acquire Chromalloy Israel for approximately US\$3.5m (subject to certain price adjustments) in cash payable at the closing of the transaction. TAT shall pay additional amounts of up to US\$ 2m in the event that Chromalloy Israel meets certain annual revenue targets in 2015 and 2016. The acquisition is expected to close before the end of September 2015. Chromalloy Israel, located in Kiryat Gat, Israel, specializes in overhaul and coating of jet engine components, including turbine vanes and blades, fan blades, variable inlet guide vanes, afterburner flaps

and other components. Chromalloy Israel, an FAA and an EASA approved repair station, is ISO 9001 and AS9100 certified and has been approved by major OEMs to perform unique coatings with specific substances. Following the completion of the transaction, Chromalloy Israel is expected to change its name to Turbochrome Ltd.

### Hawker Pacific acquires Aeromil Pacific

Hawker Pacific and Aeromil Pacific have entered into a definitive agreement under which Hawker Pacific has acquired Aeromil Pacific for an undisclosed amount. Aeromil Pacific, established in 1980, is one of the largest and most successful privately owned and operated aviation organisations in the region specialising in new Cessna aircraft sales, pre-owned aircraft sales, aircraft maintenance, parts support, aircraft management, charter services, and pilot training. The addition of Aeromil's operations to Hawker Pacific, creates a regional powerhouse in aircraft sales, aircraft support and aviation services. The combined business will also benefit from an enhanced product portfolio, providing access to the range of Textron's iconic products such as Beechcraft, Cessna and Bell Helicopter under one roof.

### Airbus Group reports solid half-year 2015 results

Airbus Group reported solid half-year results supported by an improved operational performance and confirmed its 2015 guidance. Group order intake in the first six months of 2015 increased sharply to €53.9bn (H1 2014: €27.7bn), with the order book value rising to €927bn as of June 30th (year-end 2014: €858bn) taking into account a positive revaluation linked to the strengthening of the US dollar. Airbus received 348 net commercial aircraft orders (H1 2014: 290 net orders), including 57 A330 Family aircraft. Demonstrating the continued strength of the commercial aircraft market, 421 firm orders and commitments were announced during the Paris Air Show. Airbus Helicopters received 135 net orders (H1 2014: 148 units), including 29 H175s. Order intake by value rose 40% at Airbus Defence and Space, with strong momentum seen across business lines including additional Earth observation satellites and A330 MRTTs. Group revenues rose 6% to €28.9bn (H1 2014: €27.2bn), reflecting the strong delivery mix at Commercial Aircraft and strengthening US dollar. Commercial Aircraft's revenues rose 9% with 304 commercial airplanes delivered (H1 2014: 303 units) including 4 A350 XWBs and 13 A380s. 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 six percent to € 1,883 million (H1 2014: €1,769m) with improvements in all Divisions. Commercial Aircraft's EBIT before one-off rose to €1,533m (H1 2014: €1,287m), driven by operational improvement and some favourable cost phasing including research and development (R&D) expenses. Net income increased 34% to €1,524m (H1 2014: €1,135m) while earnings per share (EPS) rose the same percentage to €1.94 (H1 2014: €1.45), driven by the improved operational performance. Both included the Dassault Aviation capital gain and A400M charge. The finance result was €-344m (H1 2014: €-252m) and included one-offs totalling € -100m mainly from negative foreign exchange revaluation of financial instruments.

### Spirit AeroSystems reports second quarter net income of US\$155m up 8%

Spirit AeroSystems reported second quarter financial results driven by positive operating performance of mature programs. Spirit's second quarter 2015 revenues were US\$1.7bn, down 6% compared to the same period of 2014 primarily due to the Gulfstream wing divestiture and lower revenues recognized on the 787 program. Operating income was US\$230m, up from US\$216m for the same period in 2014. Net income for the quarter was US\$155 million, compared to net income of US\$143m in the same period of 2014. The current quarter includes \$0.02 earnings per share for the partial release of the deferred tax valuation allowance as compared to \$0.03 for same period of 2014. Spirit's backlog increased to US\$47bn at the end of the second quarter driven by continued strong commercial aerospace demand.

### GKN to acquire Fokker Technologies for €706m

GKN, a UK headquartered global engineering group with over 50,000 people working in the aerospace, automotive and land systems markets, has agreed to acquire Fokker Technologies Group B.V from Arle Capital for an enterprise value of €706m (£499m). The acquisition of Fokker further enhances GKN's position as a leading global supplier to the aerospace industry. The combination brings together two leading technology companies with broad product portfolios and established positions on major aircraft platforms. Fokker is a specialist Tier 1 supplier to the commercial, military and business jet markets. With almost 5,000 employees Fokker is headquartered in the Netherlands and has operations in Europe, North America and Asia. In the year ended December 31st, 2014, Fokker generated revenue of €758m. Fokker specialises in the design, development and production of lightweight aero structures, electrical wiring interconnection systems and landing gear. It also provides maintenance, modification and logistic services to aircraft owners and operators.

### MTU Aero Engines raises forecast in light of half-year results

MTU Aero Engines AG saw its first-half-year revenues rise by 21% to €2,202.0m in 2015 (1-6/14: €1,815.8m). The group's operating profit grew by 25% to €212.8m (1-6/14: €170.7m), while the EBIT margin increased from 9.4% to 9.7%. Earnings after tax climbed 33% to €147.2m (1-6/14: €111.0m). The greatest increase in revenues in the first six months of 2015 was registered by the commercial maintenance business, where revenues grew by 32% from €572.9m to €754.2m. The main source of these revenues was the V2500 engine that powers the Airbus A320 family. Revenues in the commercial engine business increased by 21% to €1,251.8m (1-6/14: €1,032.9m). Here, the key revenue drivers alongside the V2500 were the GP7000 engine for the A380 and the GENx for the Boeing 787 and 747-8. MTU's commercial maintenance business saw its earnings rise substantially in the first half of 2015, with a 53% increase in adjusted EBIT to €73.5m (1-6/14: €48.0m). The EBIT margin gained 1.3 percentage points, rising to 9.7%. "The continuing strength of the U.S.

dollar has boosted our revenues and earnings these past six months, throughout all business segments. These results have allowed us to revise our full-year forecast in the expectation of setting new records once again in 2015,” said Reiner Winkler, CEO of MTU Aero Engines AG. MTU now foresees revenues of around €4,600m for 2015, instead of the €4,400m predicted at the beginning of the year (2014: €3,913.9m). Adjusted EBIT is expected to rise to around €430m (2014: €382.7m) and adjusted net income to around €295m (2014: €253.3m). The corresponding amounts in MTU’s original outlook were €420m for adjusted EBIT and €285m for adjusted net income.

### Alcoa completes acquisition of RTI International Metals

Alcoa, a leader in lightweight metals, has completed the acquisition of RTI International Metals (RTI), a global leader in titanium and specialty metal products and services for the aerospace, defense, energy and medical device markets. The merger, announced on March 9th, became effective on July 22nd. Under the terms of the merger agreement, each share of RTI common stock has been converted into the right to receive 2.8315 shares of Alcoa common stock, plus an amount of cash in lieu of fractional shares of Alcoa common stock. With RTI, Alcoa expands its reach into titanium, the world’s fastest-growing aerospace metal and adds advanced technologies and materials capabilities for greater innovation power in aerospace and beyond. Alcoa expects RTI to contribute US\$1.2bn in revenue in 2019, up from US\$794m that RTI generated in 2014, with 65% of revenues supported by contracts over the next five years. RTI’s profitability is expected to reach 25% EBITDA margin in 2019. Contracts that underpin RTI’s growth include the recently announced contract with Airbus for finished titanium structural supply parts for the new A350-1000 aircraft program. Under the agreement, Alcoa will supply titanium parts for the fuselage, among other components.

### Boeing reports 33% fall in quarterly profit

Boeing reported second-quarter revenue increased 11% to US\$24.5bn on record commercial deliveries. Second quarter 2015 results included the previously announced US\$536mn after-tax charge on the KC-46 Tanker program reflecting higher estimated costs. Net earnings dropped 33% compared to the previous year. Core earnings per share (non-GAAP) guidance for 2015 has been adjusted to between \$7.70 and \$7.90 per share, from \$8.20 and \$8.40, to reflect the impact of the second quarter 2015 KC-46 Tanker charge (\$0.77 per share), partially offset by strong performance (\$0.27 per share). GAAP earnings per share has been adjusted to between \$7.60 and \$7.80, from \$8.10 and \$8.30. Commercial Airplanes second-quarter revenue increased 18% to US\$16.9bn on higher delivery volume and mix. Second-quarter operating margin was 7.1%, reflecting the previously announced US\$513 million pre-tax charge on the KC-46 Tanker program and the dilutive impact of higher 787 and 747 deliveries partially offset by strong performance on production programs. Commercial Airplanes booked 171 net orders during the quarter. Backlog remains strong with nearly 5,700 airplanes valued at US\$431bn.

### B/E Aerospace reports second quarter 2015 financial results

B/E Aerospace posted its second quarter 2015 financial results. Second quarter 2015 revenues of US\$700.6m increased 5.7% as compared with the prior year period (revenues increased 6.5% adjusting for the impact of unfavorable Euro exchange rates). In addition, revenues from the Company’s Russian customers were negatively impacted by the economic sanctions and the collapse in global oil and gas prices. Excluding sales to Russian customers and adjusting for the negative impact from currency, revenues increased 7.8%. Organic revenue growth was 2.2% and was 2.9% on a constant currency basis. Spares revenues which increased at a double-digit rate in the first quarter, grew at a more tepid 3.3% rate in the second quarter. Operating earnings of US\$127.3m increased 6.3% and operating margin of 18.2% expanded 10 basis points, each as compared with the prior year period. On a GAAP basis, operating earnings increased 14.1%. Second quarter 2015 net earnings were US\$78.9m representing an increase of 17.1%, as compared with the prior year period. On a GAAP basis, net earnings increased 26.6%.

### Lockheed Martin to buy Sikorsky for US\$9bn

United Technologies has reached an agreement to sell its Sikorsky Aircraft business to Lockheed Martin for US\$9bn in cash. The transaction, which is subject to regulatory approvals and customary closing conditions and adjustments, is projected to close by year-end or in the first quarter of 2016. Proceeds from the sale are expected to be used to fund additional share repurchase to offset the earnings impact related to the sale. “We are very pleased to announce this transaction,” said UTC President and Chief Executive Officer Gregory Hayes. “Exiting the helicopter business will allow UTC to better focus on providing high-technology systems and services to the aerospace and building industries and to deliver improved and sustained value to our customers and shareholders.” In addition, UTC’s Board of Directors has authorized a share repurchase program for up to 75 million shares of the company’s common stock, which would be worth approximately US\$8.3bn based on the NYSE closing price of UTC shares on July 17TH. The new authorization replaces a previous program, approved in February 2013, which was nearing completion. The precise timing and amount of repurchases will be determined based on the company’s evaluation of market conditions and other factors, and the program may be suspended or discontinued at any time.

### Bohai Leasing to acquire 20% strategic interest in Avolon for US\$429m

Avolon, the international aircraft leasing company, and Bohai Leasing, the Chinese leasing and financial services company affiliated with HNA Group, have entered into an agreement under which Bohai will make a cash tender offer for 20% of the outstanding common shares of Avolon at a price of US\$26 per common share. The Transaction will be open to all Avolon shareholders. The cash tender offer of US\$26 per share represents a 14.5% premium to Avolon’s

volume-weighted average price last week (July 6th – 10th, 2015) and a 30% premium to Avolon's Initial Public Offering at US\$20 per share in December 2014, reflecting the substantial embedded equity value of Avolon's existing portfolio and its sector-leading platform. This strategic investment by Bohai reinforces Avolon's position as a leading independent aircraft lessor and allows Bohai to more rapidly expand its exposure to the global aircraft leasing sector. Bohai's strong presence in the aviation and transportation finance and leasing sectors in China will help strengthen Avolon's relationships in the rapidly growing Chinese aviation market.

### Macquarie Infrastructure Corporation discloses performance Fee payable for second quarter of 2015

Macquarie Infrastructure Corporation (MIC) announced that a performance fee of US\$135.6m is payable to its external Manager, Macquarie Infrastructure Management (USA), as a result of out-performance by the Company of its benchmark index over the sec-

ond quarter of 2015. The fee represents outperformance of MIC's benchmark of approximately 10.8% during the quarter ended June 30, 2015. Performance fees are payable when total shareholder returns are positive and exceed the total return for the benchmark index in both the quarter and cumulatively. The Company will settle the fee in two payments with US\$67.8m paid in cash in July of this year and the balance settled in shares of MIC to be issued in July of 2016. The number of shares issued next year will be based on the volume weighted average share price at which a performance fee for the second quarter in 2016, if any, would be reinvested. The MIC board requested, and the Manager agreed, that the payment of a portion of the fee be in cash rather than entirely reinvested in shares as means of minimizing any dilutive impact of a share issuance to settle the full amount. The settlement of this particular performance fee in part in cash and shares in 2016 represents neither a change in policy nor a modification of Macquarie's views on the value of MIC shares.

## Other News

**STG Aerospace** announced the completed installation of a saf-Tglo SuperSeal UltraLite (SSUL) emergency floorpath marking system with OverCarpet and a liTeMood LED cabin lighting system on the Boeing 757-200 operated by DreamJet trading as **La Compagnie**. La Compagnie operates scheduled flights to New York from both Paris and London, business class only. The 757 aircraft's cabin is fully equipped in a business-class configuration with only 74 lie-flat seats. Installing both systems enabled STG Aerospace to demonstrate its holistic approach to cabin lighting – ensuring that different areas of lighting within the cabin are not only task-optimised but also integrated and optimised within an overall cabin aesthetic that enhances both the passenger experience and the airline's brand identity. Certified by the EASA and FAA, SSUL is the latest version of STG Aerospace's saf-Tglo – a product that is currently installed on over 9,000 aircraft worldwide. SSUL will be an option for airlines to select on new Boeing 737 MAX and Embraer E2 aircraft and is fully certified and available for retrofit.

**CMD Flight Solutions'** recent FAA approval for an Automatic Dependent Surveillance-Broadcast (ADS-B) Out Approved Model List

(AML) Supplemental Type Certificate (STC) provides aircraft operators with an expanded certification path. The solution includes the installation of **Universal Avionics** SBAS-Flight Management System (FMS) and **Rockwell Collins** TDR-94(D) Mode S Transponders. This comes at an opportune time to allow operators to take advantage of Universal Avionics and Rockwell Collins' ADS-B Out Incentive Package Program. The companies recently joined forces to bring an affordable, integrated ADS-B Out solution, allowing operators to add the Rockwell Collins TDR-94(D) Mode S Transponders to their Universal Avionics SBAS-FMS installation. In addition to meeting the ADS-B Out mandate, these operators are also able to provision for Controller-Pilot Data Link Communications (CPDLC) and Localizer Performance with Vertical Guidance (LPV), unlike other stand-alone ADS-B Out solutions.

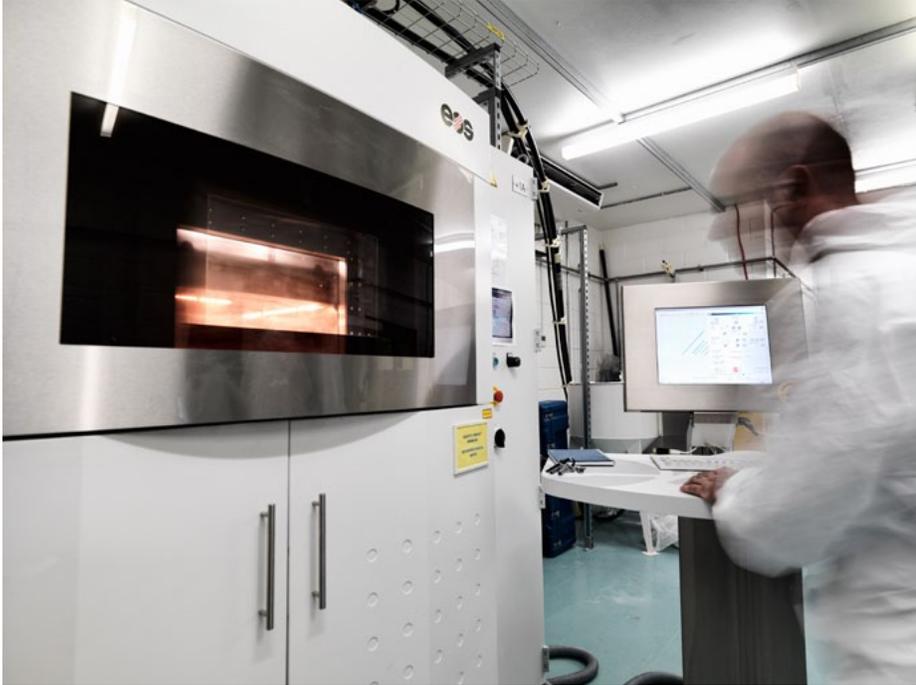
**RJE International** has appointed **Avio-Diepen** as a worldwide distributor for its ELP362D product line of underwater locator beacons which are mounted on every "black box" (cockpit voice recorders and flight data recorders). Together with **AD-S&Co**, their subsidiary company which specializes in the rotary wing market, Avio-Diepen will provide a

full spectrum of support to RJE and the entire underwater locator beacon product line. "The addition of RJE's underwater locator beacons to our assortment is yet another milestone for our safety equipment portfolio. RJE's beacons are best-in-class with a vastly improved battery life." says Kees Burger, Director of Product Management for Avio-Diepen.

**Garmin International**, a unit of **Garmin (GRMN)**, and **Jeppesen**, a part of **Boeing Commercial Aviation Services**, announced an expansion of the Garmin Connex ecosystem, which broadens compatibility to include Jeppesen Mobile FliteDeck. With compatible Garmin avionics, customers can wirelessly receive ADS-B weather and traffic, as well as display precise GPS position data and back-up attitude information within compatible products and devices. Jeppesen Mobile FliteDeck is expected to support the display of ADS-B traffic and weather, as well as WAAS GPS position information from a compatible source. Additional details regarding avionics compatibility and features will be introduced in a future release.

## Adapting to 3D

MRO providers need to invest in new capabilities over the next few years as manufacturers deliver aircraft and engines with new technology and services. **Keith Mwanalushi** looks at how far 3D Printing will influence MRO procedures.



3D metal printer in process.

Photo: Airbus

The MRO landscape is changing and continuously evolving – and rightfully so. The MRO sector has become, over the past couple of decades, a fiercely competitive environment within the context of a shrinking global village and ever-changing demands from customers where price, service, expertise and turnaround times are business-critical selling propositions.

New technologies such as 3D printing (additive manufacturing) will significantly influence how the industry does business. To compete as technology changes MRO's and other supply chain service providers will have to innovate.

"We are actively pursuing possibilities to enhance the use of additive manufacturing in the airline industry," declares Johan Bank, VP Engineering at AF KLM E&M. "We are seeing first opportunities for usage of this kind of techniques inside the cabin, such as small series of 3 D repairs, much plastic materials, but also looking for possibilities to make certification of this kind of produced parts more easy and less costly. We own a 3D printing in house at- AFI KLM E&M and use it also for prototype production when designing a repair, it is faster and cheaper," says Bank.

Risto Mäeots, COO at Magnetic MRO observes that 3D printing brings another tool to the engineer's kit that allows them to offer solutions that previously didn't exist. "We recognise the value of the technology and are evaluating a partnership with a company (Addaero Manufacturing) that specialises in 3D printing for the aerospace market. With our knowledge of the European aerospace market and their experience in 3D printing it should make a powerful combination to offer more solutions to customers," he says.

FL Technics have considered, explored and already invested in new technologies at its facilities: composite workshops, NDT and GSE departments already have some hi-tech equipment that are used, according to the Lithuanian-based MRO. "However, the final decision using 3D printed spare parts will be made following a general market consent," remarks Zilvinas Lapinskas, the CEO of FL Technics.

At the same time, Lapinskas feels there are good reasons to believe that 3D will become a common procedure in the hangars of tomorrow as this tool, according to him, provides significant advantages in reducing aircraft and component weights, as well as spare part support.

"We can see first pioneers, such as Airbus, Pratt & Whitney and GE are preparing for mass metal 3D printing thus encouraging smaller companies to follow down the same path. Nonetheless, those being only the first steps, there is still a lot to do in terms of certification and control of quality. Both, manufacturers and authorities will have to work closely in order to make additive manufacturing a tool we can use industry-wide," Lapinskas notes.

Speaking of GE, Mark Meyer, Advanced Manufacturing Programmes Manager at GE Aviation confirmed that GE Aviation has been using 3D printing technology for 15-20 years on tip repairs of turbine blades. "It is well integrated into our processes and has proven to be very successful," he says.

The Satair Group, working closely with Airbus and Airbus engineering, is using the latest technology to develop the area of 3D printing as a new technology for the aftersales business, "even for out of production or legacy aircraft programmes," Dr Mareike Boeger, the Head of Additive Manufacturing Solutions at Satair Group.

Boeger explains: "Out-of-production is a major opportunity for 3D printing in the spare parts business, offering a new solution for ensuring the availability of parts, but also active aircraft programmes will benefit from the technology. The goal is to use the existing established capabilities and to develop new logistics and even more effective business models for our customers."

Further into the future, as part of the "concept plane vision", Airbus imagines additive manufac-



Zilvinas Lapinskas, CEO of FL Technics

ture taking centre stage as a key technology for producing very large parts or even the entire fuselage structure.

Following the certification of titanium and other alloys, the scope of parts available for printing greatly increases, as aircraft such as the A300/A310 and even the A380 were designed and built largely using metals according to Boeger.

“Continuing the theme of customisation, with a wider range of materials and processes certified, it will be possible to offer a high level of customisation and one-off parts to customers in ways that have not yet been explored. Bionic parts will also become available which will see parts being optimised for the specific application which is simply not possible using today’s traditional manufacturing techniques,” Boeger foresees.

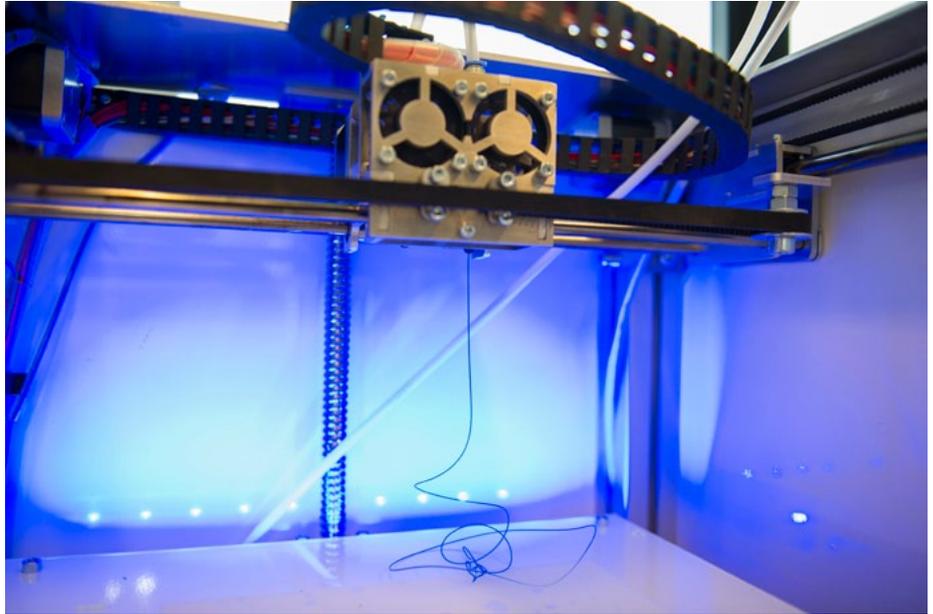
According to industry analysts technological advances such as 3D printing could cut a considerable amount of MRO spending from the aftermarket and spawn new business models and revenue streams.

“I see one of the biggest immediate opportunity for 3D printing is the manufacturing of tools needed to work on engines and fix components,” says Meyer from GE Aviation. “Currently there is a long lead time to obtain tooling, and MRO providers and airlines can quickly produce the tooling using 3D printing.”

Sebastian Beermann from InteriorsDIRECT in Germany says the savings highly depend on the application of the technology. “The main advantages of 3D printed parts are the manufacturing of small lots, no investments in tooling’s and a



Mäeots recognises the value of the new technology.  
Photo: Magnetic MRO



At AFi KLM 3D printing is done in-house.

Photo: AF KLM E&M

related shorter lead-time. In competition to other traditional technologies the material price and can be seen. So as with every technology, 3D printing has its pros and cons.”

**“Out-of-production is a major opportunity for 3D printing in the spare parts business, offering a new solution for ensuring the availability of parts, but also active aircraft programmes will benefit from the technology.”**

Dr Mareike Boeger, Head of Additive Manufacturing Solutions at Satair Group

Back at AF KLM, Johan Bank recons other production techniques are cheaper when you have to produce large quantities. “Development also depends on the position of the OEM in sharing design information. At this moment ‘reverse engineering’ is the most promising approach. It will be required to define a common standard of method of working across the industry and collecting large quantities of data towards authorities on material properties. This enables the certification processes.”

Although there are many areas where the technology will add value one of the areas that Magnetic MRO is most excited about is out of production spares as Boeger also mentioned. “This will be possible with the combination of our EASA Part 21 approval,” says Risto Mäeots.

The ability to streamline logistics for the legacy aircraft could have a profound effect on the current MRO market. “Our goal is to align with the major OEM’s to help drive the adoption of the technology and ultimately provide them the abil-

ity to help support their customer’s legacy fleet. From our perspective this makes us a more competitive option in the MRO market by providing more reliable access to hard to find spare parts or spares, which due to different reasons are unreasonably expensive,” Mäeots adds.

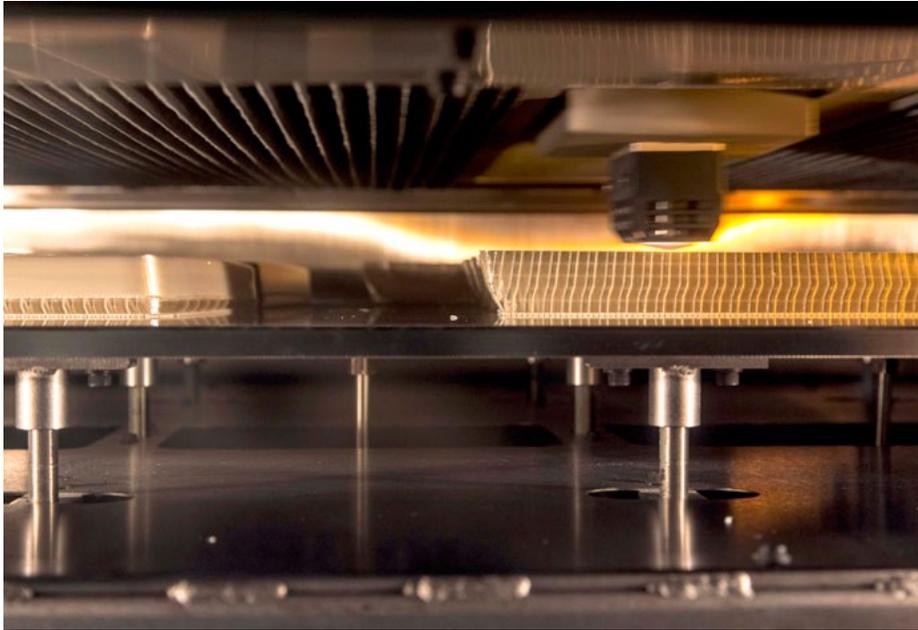
In general, Lapinskas from FL Technics thinks 3D printing could make MRO companies’ life a lot easier. He says firstly, replacement of end-of-life components could become

much easier and moreover, the need for extensive part inventories would greatly diminish.

“However, knowing that at this stage 100% of the printed parts need post-production work, including polishing or machining, it is still unclear whether the advantages will outweigh the time implied,” suggests Lapinskas.

Furthermore, he says engines and other components would have fewer parts, which would translate into fewer man-hours for their MROs. “Yet again, while it could cut spending on repair or restorations of spare parts and engines, it could also lead to losses in volume, meaning loss of profit. In addition, there is a significant opportunity in using 3D printing to eliminate huge amount of waste as opposed to traditional subtractive manufacturing that is broadly used today. This would not only offer savings on waste material, but could reduce buy-to-fly ratio as well.”

Interestingly, a 2015 MRO survey by Oliver Wyman shows that 3D printing has the lowest priority in



3D plastic printer in process.

Photo: Satair Group

terms of new MRO technologies, compared to new repair technologies or predictive maintenance techniques which seem to have more potential to upset current market dynamics.

Beermann anticipates that the success of the application depends on the combination of technology execution and application knowledge. He suggests that due to the fact that there are only a few 21J/21G organisations working with 3D printing for more than three to five years and after-market application just started, it will still need some time to get people confident about the 3D printing approach. "A higher step even is the application of 3D printing for partly repairs and so on. This is what we do with cabin parts and we see that it needs material and process knowledge coupled with qualification background."

James Kornberg AF KLM E&M Director Innovations admits that there are still large hurdles to be taken; he says the business case is not yet clear and airlines and MRO's are dependent of authorities on certification process and on OEM design data. "We will have to find in which area the 3D process will have the most added value."

"Without a doubt the introduction of 3D printing is going to take time," contributes Richard Merlino, President at Addaero Manufacturing. "The current focus of the Industry is getting the process approved for new production. In the coming years you will see an explosion in the use of the technology in the current production system but it will take time to start impacting the MRO industry. That being said there is significant benefit today with using 3D printing for customised jigs and fixtures. MRO's that are not taking advan-

tage of this are at a competitive disadvantage," Merlino warns.

Meyer agrees with the findings of the survey; "It is a low priority in MRO. At GE, we've been using different types of 3D printing in MRO for many years and are already applying this technology at various levels." He adds that GE continues to evaluate this technology in MRO and will expand its use where it makes the right sense.

It seems one area of concern is integrating these new technologies successfully with legacy systems. As noted already in this article, one of the application fields is serving ageing fleets. "This

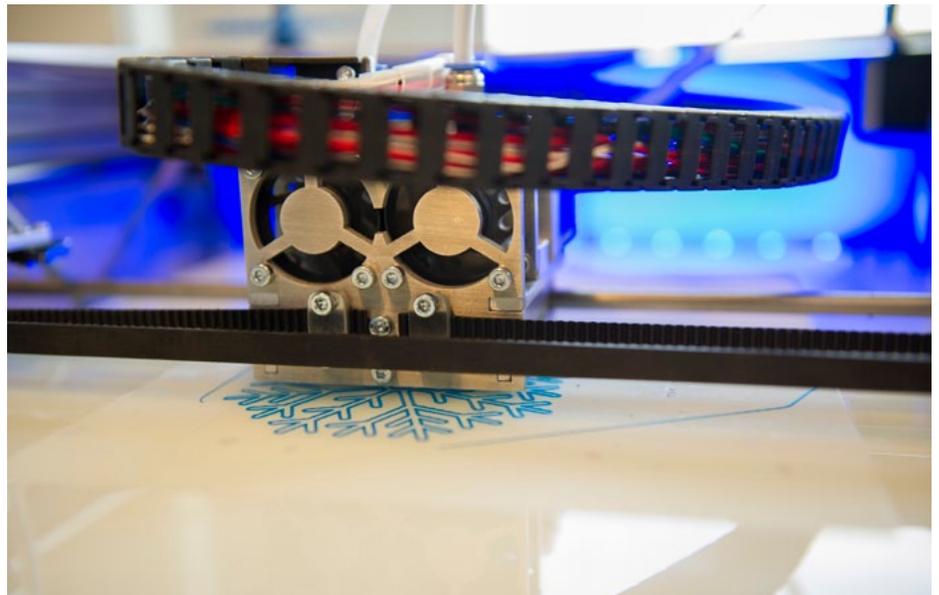
causes additional process steps, for example, typically no 3D models exists for the older parts which means these have to be produced," says Boeger.

Lapinskas says legacy systems are an integral part of every MRO and were so for many years. "Nonetheless, if one wants to work in a lean way, we have to develop and improve. This means adopting a system that would work well with such new technology as 3D printing. Even though it might be pricey, but changing your system in order to be open to the future technologies is now a must rather than an option and FL Technics understands that very clearly."

Over at AF KLM E&M they are fully aware that it is always a big concern, not only with 3D printing. Kornberg states that introducing new technologies in legacy systems can ultimately prevent further development. "And therefore we are pushing our engineers to implement new technology also to legacy systems. New technology can help to improve older design of current aircraft."

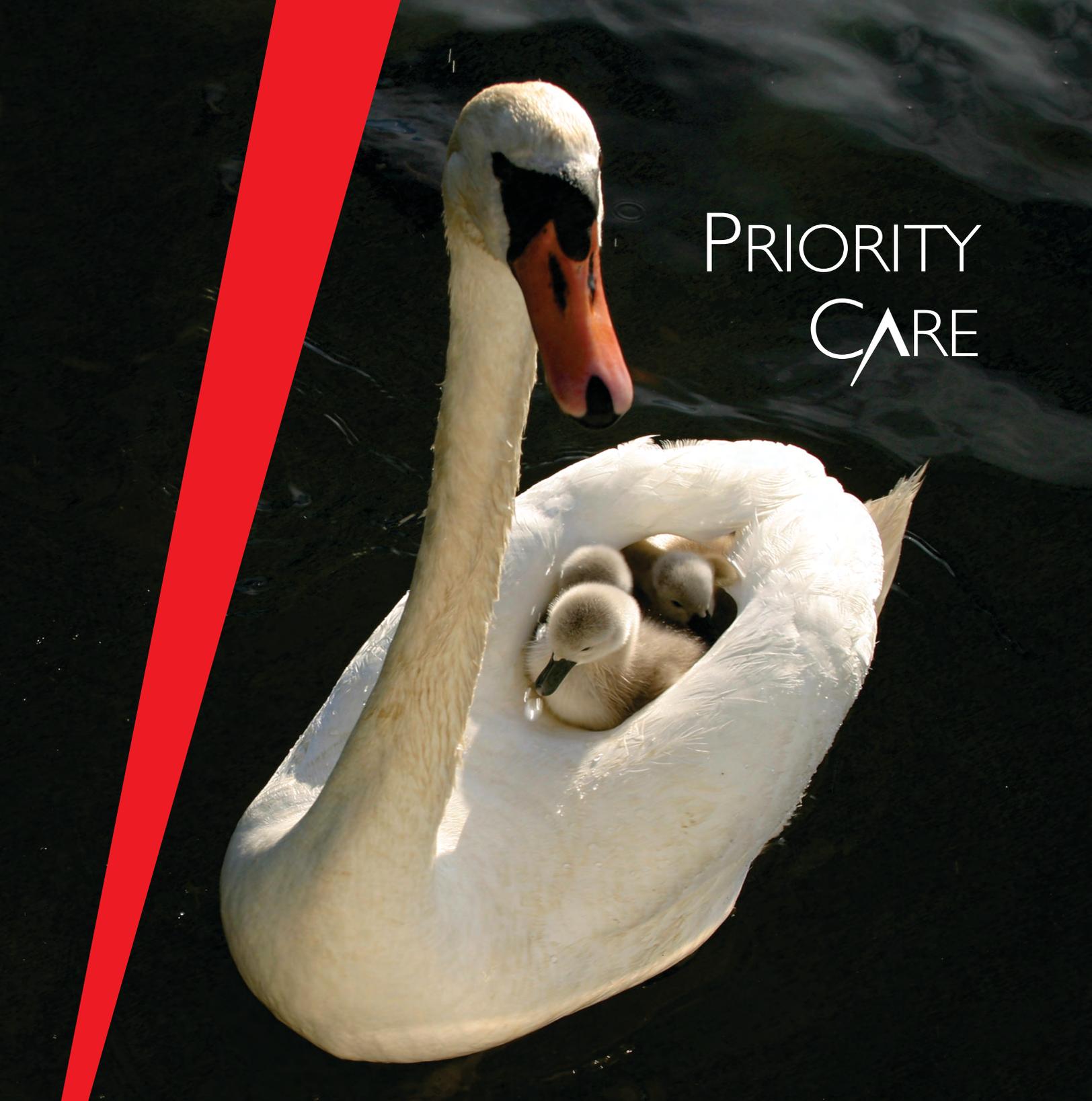
Mäeots anticipates the technology will become more proven on the new production systems and it will slowly filter down to the legacy aircraft. "Our goal is to closely align with the OEM's and help drive the path forward and ensure Magnetic MRO is a leader in the technology."

Meyer concludes and says GE continuously introduces new technology in MRO and understands how to integrate it with legacy systems. "3D printing is no different. If a new technology is introduced onto an engine or MRO, we have extensive experience working any integration concerns."



Despite the growing popularity 3D printing remains a low priority in the industry.

Photo: AFI KLM E&amp;M



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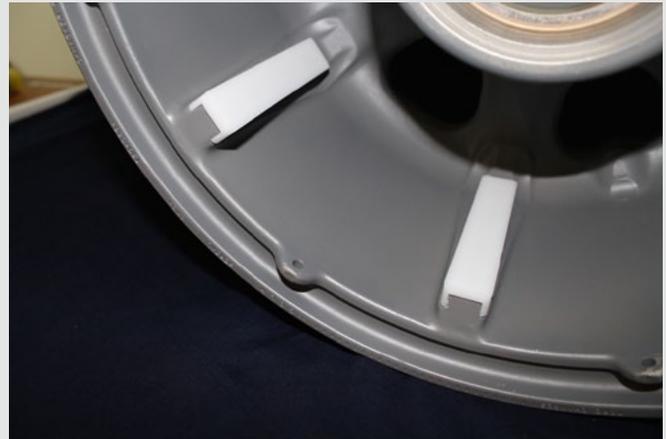
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## Wheels and brakes: A paint job solution

Aircraft wheels and brakes are seriously damaged during the two most critical phases of flight - take-off and landing. With such wear and tear, these two essential components of every aircraft require continuous overhaul for their safe operation.

Currently, after wheel and brakes are repaired, most overhaul centres rely on old-school masking tape to cover specific openings so their housings can be primed, repainted and coated. The tape is stretched and then trimmed to size with razor blades – a process that’s both tedious and labour-intensive.

After listening to constant complaints from paint shops, Rich Brown and Jason Rayman used their 30 years of aviation maintenance experience to develop a practical and lean solution. Their result is Blackbird’s unique patented masking kits. With a Blackbird kit, an aircraft wheel or brake can be masked or unmasked in less than two minutes – a dramatic savings in both time and expense over the current method. For example, a basic Citation wheel requires 40 minutes to tape. The Blackbird masking kit can accomplish the same task in just 38 seconds.



All photos: Blackbird



The team at Blackbird have also pioneered other solutions for aircraft wheel and brakes. Wheel stands can secure a tire in place to easily install the wheel. High quality, affordable and easy to use custom stencils quickly help to identify tire changes and dates of install. Valve stem wheel protectors prevent breakage in transit. Blackbird’s brilliant turntables can handle up to 1k lbs and makes it cinch to turn a wheel with one hand. Wheel cone stands are used during the wheel primer process. Just spray and flip - there is no waiting for one side to dry. These workhorses ensure your business is as efficient as possible saving you time and money.

Blackbird masks snap on easily and are manufactured to the industry’s highest standards, ensuring product consistency. The paint masking’s meet OEM specs detailed in the overhaul manuals and have been tested and specifically engineered for aircraft wheels and brakes. Using Blackbird’s paint masking’s eliminates the potential for personal injury, overtime costs, waste and excessive disposable tape purchasing. All of Blackbird’s products can be custom-manufactured to a client’s specifications. Blackbird’s kits are currently used in Aviall, Honeywell, Aerolineas Argentinas, Copa Airlines, Messier-Bugatti-Dowty and many other repair maintenance facilities.

Orbs are another great aviation tool for product and brand recognition. This easy to install name plate fits in the bearing bore area of a wheel and is used to protect bearings in transit while promoting your business. Your wheels can stand out from the rest simply by incorporating your logo or company information. They can also be attached on the outside of wooden boxes and crates to instantly identify your company and/or products.



# In the hot seat.....

**Keith Mwanalushi** speaks to Lee Burgess Head of Engineering, Monarch Aircraft Engineering

**AviTrader MRO:** What attracted you to this business?

**Burgess:** What's not to like! As a child I always had an interest in all things aviation and enjoyed disassembling things to see how they worked and then putting them back together to see if they still worked, so a career in aircraft maintenance was ideal for me and I was lucky enough to gain an apprenticeship with Monarch Aircraft Engineering when I left school. Since then the opportunity to meet new people, learn new skills, and travel have kept me motivated in my role.

**AviTrader MRO:** What does a typical day's work entail in your job?

**Burgess:** I have recently taken on a new role and so things are yet to settle down for me but as Head of Engineering for Monarch Aircraft Engineering I am responsible for the strategic direction of the Engineering division and its financial performance. My responsibilities include continuing airworthiness management for contracted Part M customers, aircraft lease management, design services, fleet technical support, maintenance planning and production planning. At present I am focused on team development and getting to better understand the services that we provide to each of our customers.

**AviTrader MRO:** What is the most challenging part of your job?

**Burgess:** Aviation is a 24/7 industry and so the real challenge is getting a good work/life balance. There is always a lot to do but I have a good team around me with a huge amount of experience so working together is key.

**AviTrader MRO:** MAEL recently announced an extension of its FAA approval at bases in Birmingham and Copenhagen. How significant is the market from North America at the moment?

**Burgess:** For us it is hugely significant. We have a major contract with a large North American operator and we want to ensure that we can offer them the maximum in terms of flexibility. Birmingham is a key facility for us as it gives us huge scope in terms of the type and number of aircraft it can accommodate and gaining FAA approval always formed part of the roadmap.

**AviTrader MRO:** MAEL's new maintenance hangar in Birmingham is now fully operational. What opportunities have you seen in terms of new engineering activities?

**Burgess:** The hangar opened in November 2013 so we have completed two winter and one sum-



Lee Burgess Head of Engineering - MAEL

mer season in the facility so far, in fact to date we have generated over 300,000 direct man-hours since it opened. The additional capacity has given us a significant amount of extra flexibility when it comes to accommodating customer aircraft and as it is a key operating base for Monarch Airlines and our third party customers it means we can better meet their maintenance needs.

**AviTrader MRO:** Line maintenance seems to be a growing business. Are you making any further investments in this area?

**Burgess:** We identified some years ago that line maintenance was a growing opportunity as maintenance schedules developed and more tasks were broken out of the typical A and C check requirements and airlines wanted to benefit from this by reducing hangar downtime and undertaking work in the line environment. We are always reviewing possible new locations and importantly customers who would like to work with us, an example of this is Warsaw where we have a line station supporting a B787 customer.

**AviTrader MRO:** In terms of overall capabilities, what's next in the pipeline at MAEL?

**Burgess:** In the last few years we have taken on new line and base types with B787, Embraer 195/175 and Bombardier Q400, in terms of another key business area we continue to expand our CAMO technical support services with customers around the world, tailoring this service to the exact needs of the customer being our speciality.



MAEL opened a new hangar facility at Birmingham in 2013.

Photo: MAEL



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# Right shoring MRO

## How Improving US Competitiveness Is Shaping Maintenance Investment Decisions

By Kevin Michaels, Senior Adviser – Aerospace & MRO Advisory – ICF International.

**A**erospace manufacturing “right shoring” has received significant attention in recent years as a result of shifting comparative advantage and morphing OEM supply chain philosophies. The Southeastern US and Mexico are the new hotspots for aerospace manufacturing investments.

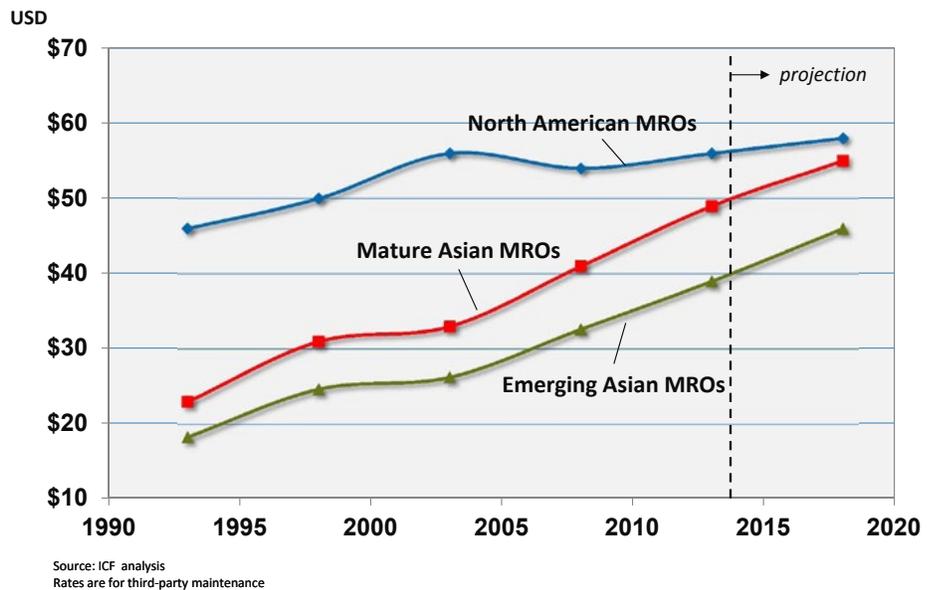
What about Maintenance, Repair and Overhaul - is the same thing happening in the U.S.? The answer is a qualified yes. Consider the following recent investments in labour-intensive airframe heavy maintenance:

- AAR is establishing new facilities in Rockford, Illinois and Lake Charles, Louisiana, and the latter will cater to widebody aircraft
- After years of anticipation, Lufthansa Technik has its first major North American heavy maintenance facility in Puerto Rico
- Aviation Technical Services just opened a new facility in Lake Moses, Washington
- Airborne Maintenance & Engineering Services just expanded its Wilmington, Ohio facility to target A320 heavy maintenance
- Delta Airlines and Aeroméxico opened a joint heavy maintenance facility in Querétaro, Mexico

Recent analysis by ICF International indicates that North America led other regions for major MRO investments in the 2012-2013 timeframe, and momentum appears to be accelerating. Just a few years ago, it was China that was the MRO investment hot spot.

Underpinning this shift is a convergence of labour rates between North America and Asia. A decade ago, a customer could expect to pay \$50-55/hour for heavy maintenance labour from a US MRO – 50% more than established Asian MROs in Hong Kong or Singapore, and an even larger differential with emerging Chinese MROs. Not surprisingly, many North American operators shifted wide body heavy maintenance to Asia. Today, labour rates for North American MROs are nearly the same as a decade ago thanks to the 2008/09 recession and modest wage rises, while rates in Singapore and Hong Kong are approaching \$50/hour. In China, it is around \$40/hour. ICF International expects the labour rates to converge further this decade. Add to this the higher cost of ferry flights to Asia and the lower man hour intensity of heavy checks on new platforms, and it is no surprise that North American operators are increasingly pursuing in-region suppliers for airframe maintenance.

### Average Widebody Airframe Heavy Maintenance Hourly Labor Rates



Does this mean that MRO investment will inexorably shift to North America? Not necessarily. One way that MRO differs from manufacturing is the significant importance of proximity to customers for maintenance services. And maintenance spending growth will be led by customers in emerging economies. Today’s \$60B in air transport maintenance spending will increase to \$90B in the next decade. Approximately half of this growth – about \$15B -- will come from Asia and the Middle East. North America will grow by less than \$3B. Demand growth inevitably will support growing investment in other regions. So the best way to explain the recent shift in investment is that the days of easy labour arbitrage in Asia are drawing to a close, and new investment in North America reflects the likelihood that more maintenance will take place closer to home.

What is happening in the other major maintenance categories? Aero engine maintenance is capital and material intensive, with labour comprising just 25% of total costs. Logistics, solid processes and skilled labour count for more than low cost labour. Operators prefer in-region shops, but will ship engines overseas for a good supplier. Not surprisingly, most aero engine MRO facilities are in North America and Europe, although Asia continues to add capacity. Change here will be gradual, as new engine facilities are very expensive and plenty of capacity exists for most engine models.

Component maintenance is much the same as aero engines, with labour accounting for 40% or less of total costs for most systems. Component maintenance facilities are much more dispersed than aero engine shops, and customers desire rapid turn times to improve service levels and reduce inventory holdings. Not surprisingly, new component MRO facilities are increasingly clustered around major logistics hubs such as Singapore, London, or Dubai. Miami also remains a popular location to serve Latin America.

Comparative advantage in aerospace, like most industries, is ephemeral. A decade ago, the notion of setting up a new wide body maintenance base in the US would seem farfetched. Right shoring means that the decision of where to locate new MRO facilities will be nuanced, and will reflect the ongoing tension between customer proximity and supplier quality and productivity. Expect the change to continue in the years ahead.

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Following the successful launch of their new mobile applications at the Paris Air Show, **ADSoftware** announced the signing of **Skyward Express Limited** (Kenya) and **Asia Atlantic Airways** (Thailand) for their AirPack maintenance software. Bangkok-based carrier Asia Atlantic Airways operates two Boeing 767-300ER jets, while Skyward operates a fleet of 3 Fokker 50s, 1 Fokker 100 and 2 Dash 8-300s. ADSoftware is a seventeen year old IT company based in France, with offices in Thailand, Brazil and South Africa. Specialising in solutions dedicated to the aviation industry, ADSoftware counts 56 clients worldwide. The strength of ADSoftware is the accessibility of its products which are Microsoft Windows ready, web-enabled, and multilingual. The company provides 24/7 online technical support.

**Commsoft**, a world leader in aviation engineering and maintenance systems, reported that **Travel Service**, the largest airline group in the Czech Republic, has signed a five year contract to use OASES to manage its current fleet of 31 Boeing 737NGs and two Airbus A320s. The contract provides for 25 concurrent users. Founded in 1997, Travel Service operates an extensive European route network under the SmartWings brand as well as charter flights and ACMI operations. With subsidiaries in Poland, Hungary and Slovakia, each of which operates under a separate AOC, Travel Service aircraft fly to more than 300 airports on four continents. The OASES project team will commence implementation in late 2015 in readiness for the summer 2016 season,

## People On The Move



Andy Mackay

Monarch Aircraft Engineering has announced two new appointments to its senior leadership team. **Lee Burgess** has been appointed Head of Engineering and **Andy Mackay** as Head of Maintenance. The new roles have been created following the resignation of Keith Earnden, Engineering Director who will leave the business.

Dynamic Aviation has hired **Glen Ackermann** as the new Vice President of Business Development. In his new role Mr. Ackermann will lead Dynamic Aviation's worldwide business development effort through his focus on finding and building new customer relationships.

PEMCO World Air Services has appointed **William Huntley** as Senior Manager of Regulatory Compliance and Safety. Bringing 30 years of aviation experience, Huntley is responsible for enhancing PEMCO's quality systems in order to maintain a high level of operations safety and improve customer and employee satisfaction. He joins PEMCO with a



Lee Burgess

multitude of both commercial and military aviation experience, having held a number of leadership positions in operations, compliance and engineering. Most recently, he served as Director of Corporate Safety for AAR Corp. where he oversaw compliance of their MRO businesses.

Commercial Jet Services a provider of heavy Maintenance, Repair & Overhaul (MRO) to the passenger and cargo aviation industry appoints **Mr. R. Keith Johnson** to the position of General Manager, taking the place of **Mr. John Schildroth** who resigned to pursue other interests.

328 appointed **Andreas Bulić** as its new chief financial officer reporting to CEO, **Dave Jackson**. Andreas will be responsible for 328 group financing and information technology activities. Andreas brings more than 20 years of accounting, finance and IT experience to the Oberpfaffenhofen, near Munich based aviation services company. Prior to joining 328 he worked for more than 10 years as CFO for CAE Inc, a prominent Canadian company with subsidiaries in Europe, and a global leader in modelling, simulation and training for civil aviation and defense.



Andreas Bulić