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MRO

Management

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Role Play

Aircraft find
new missions

DEEP CLEAN

Containing COVID-19
in the cabin

STAYING THE COURSE

The ATR family
continues to evolve

Holding pattern

REVIMA adapts
to the crisis

Opening the door

New facility, new style
training at STS

Fit to suit

MGT matches business
models to markets





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Editor's L E T T E R



IAN HARBISON

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Recent years have been a boom time for commercial aviation but those of us with a long experience in the industry can remember when there was some turbulence – 9/11, SARS, oil prices, economic crises – when growth stagnated or even stopped. However, this industry is remarkably resilient and the inexorable growth continues.

Coronavirus is possibly the biggest international crisis to hit the world apart from a major war. This time, commercial aviation has really suffered, with mass groundings of passenger aircraft as scheduled services were stopped, often at very short notice. In the short term, many people were stranded away from home and had to be repatriated, offering some relief to those airlines who managed to get some charter work. Now, the skies are a lot emptier, although freight flying has massively increased, with passenger aircraft being used to carry belly cargo, or even in overhead bins and on seats.

While no one is sure when the pandemic will be over, there is one aspect of its effects that offers a small gleam of hope. For the first time ever, legally enforced social isolation measures have locked people away from family and friends and, despite connections via

social media in all its guises, face-to-face contact (and actual contact) is being missed desperately.

When restrictions are lifted, it is likely that there will be an immediate upsurge in demand for air travel as people want to reconnect with each other. Many postponed or cancelled holidays will be taken, and businesses will want to physically check overseas subsidiaries as well as re-establish relationships with clients.

For the MRO industry, the interim period will see a struggle to get by with care and maintenance of all those parked aircraft, but there will be an upsurge in work to get them back in the air at very short notice, perhaps with new operators as some airlines fail to survive.

One unfortunate aspect of social distancing has been the suspension of training courses, so the next influx of urgently needed young technicians and engineers will have to be delayed. However, there should be plenty to do when they get there.

In the meantime, the Real Response Media team offer our best wishes to all our readers and advertisers. Keep safe and we hope to catch up with you again later in the year.

Ian Harbison

EDITOR



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PHOTO: STS AVIATION SERVICES

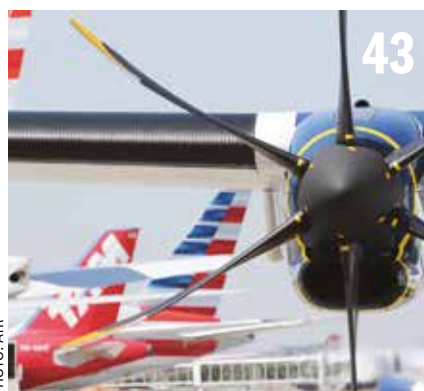


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Business Briefing

News from across the industry

TRAINING

Joramco scholarship moves ahead

Joramco, the Amman-based MRO and the engineering arm of Dubai Aerospace Enterprise (DAE), has announced that the first phase of selection for the Joramco Academy Scholarship is now complete and it will move into its second phase.

Over 1,000 scholarship applications were submitted during the February Open Day event held by Joramco under the patronage of the Minister of Labor Nidal Bataineh. After the first round of examinations, 201 applicants have moved on to the second phase, dexterity tests and interviews. The interviews will be performed by an external committee to ensure that the selection of 25 scholarship recipients is fair, unbiased, and based solely on the merit of the applicants.

The MRO scholarship is the first of its kind, and will not only cover the full cost of the aircraft maintenance training program, but also guarantee a career at Joramco after graduation. The scholarship was given full support by DAE as part of its CSR to give back to the community and will provide opportunities in line with the vision of His Majesty King Abdullah II to support the youth and create jobs through vocational training.

PHOTO: RED WINGS



MRO

Lufthansa Technik wins in Russia

Lufthansa Technik has signed support agreements with two Russian carriers, Red Wings Airlines and Smartavia.

Under a six-year contract with Red Wings Airlines, Lufthansa Technik will support IAE V2500 and CFM56-5B engines of the carrier's Airbus fleet with a full range of engine services, including engine condition monitoring (ECM). During the contract period, a shop visit is planned for each of the 24 engines currently used

by the airline. Lufthansa Technik will also maintain the landing gears of Red Wings' current fleet of eight Airbus A320s and four A321s on a fixed price basis over the next six years. The company already supports Red Wings Airlines with numerous other services, among them component support.

Smartavia has signed a long-term spares agreement covering the carrier's Boeing 737 NG fleet. The new contract provides Smartavia with guaranteed access to Lufthansa Technik's component and spare parts pool. Lufthansa Technik's support around the clock ensures that all aircraft spare parts can be supplied to the airline at short notice, reducing the time required to maintain the aircraft and therefore its ground time. Ultimately, this comprehensive support will allow Smartavia to increase its fleet renewal rate, to expand its route network and enhance the level of services provided to passengers.



ENGINES

AIESL for gtf mro

Pratt & Whitney has announced that Air India Engineering Services Limited (AIESL) will provide MRO services in support of PW1100G-JM engines at its facility in Mumbai. Pratt & Whitney powers more than 700 aircraft in service today in India, including more than 150 GTF-powered A320neo family aircraft.

AIESL's introduction to GTF maintenance will be a phased approach, starting with engine upgrade and module exchange capabilities as

immediate support of the GTF fleet in India. The facility has already received its first GTF engine.

HR Jagannath, CEO of AIESL, said: "It's an exciting time for us as we prepare for the GTF engine. AIESL has been engaged in providing engine MRO services to Air India and other operators for over 50 years now. Our association with Pratt & Whitney goes back a long time as well. The GTF engine provides us with the opportunity to showcase our capabilities and establish AIESL as one of the premier engine MROs in Asia."



CABINS

Cargo in the cabin

HAECO Cabin Solutions has launched four new, certifiable devices to allow airlines operating passenger aircraft on cargo flights during the current crisis to stow packages in the cabin.

The palletised variant can hold 450kg, the all-in-one seat frame can hold 225kg, and the seat and floor storage systems can each hold up to 108kg.

The solutions will be certified through STCs. They build on existing seating and interior technologies and can be delivered in four to six weeks. Variants can be combined for both single and twin aisle aircraft to achieve an ideal operational payload.

The installation process follows techniques used for economy seating, which can be accomplished quickly and without the need for special tools.

TRAINING

10k days in India

Pratt & Whitney has announced a recorded 10,000 student days of training at its Customer Training Center in Hyderabad, India. Launched in 2015, it is one of the three Pratt & Whitney Training Centers which offer specialised DGCA and EASA Part 147 approved trainings. The Center offers advanced training for airline customers and MRO operators, as well as industry and university skill development programmes, to spur the growth of the aviation sector in India. Several leading aerospace organisations have extended their support to the skill development

initiatives undertaken by Pratt & Whitney and will consider career opportunities to students trained by the company.

Ashmita Sethi, Pratt & Whitney Managing Director, India said: "In line with the Government of India's 'Skill India' and 'Make in India' programmes, we have strategically invested in a world-class customer training center in Hyderabad.

"We have nurtured and developed talent in the aerospace sector since 2015. Our Training Center underscores Pratt & Whitney's long-term vision and commitment of developing a robust skill

development base to support the growth of the aerospace ecosystem in India."

Underlining its contribution to the 'Skill India' initiative, the Center has delivered its programmes for students and faculty from states including Telangana, Tamil Nadu, Maharashtra, Gujarat and Haryana, and provided training for more than 30 airline operators representing 20 nationalities.

Additionally, the company has signed an MoU with leading global universities to provide aerospace and aviation skill development programmes in the country. These partnerships aim to facilitate the growth of an aviation ecosystem through development of an industry-ready talent pool in support of the massive growth in India's aviation sector.

ENGINES

NEW GRINDER FOR AERO NORWAY

Aero Norway has invested \$1.5 million in a Danobat mBTG-800 High Speed Blade Tip Grinding Machine for the precision grinding, deburring and measuring of the blade tips of finished assembled engine turbine and APU rotors.

Currently the machine is being used on every CFM56-3, CFM56-5B and CFM56-7B engine core performance workscope and is the only system approved by the OEM. The operation of the grinder is fully automatic, using all-digital technology to ensure the integrity of the system.

Neil Russell, COO of Aero Norway, said: "The biggest challenge we faced was the incorporation of the grinder into our machine park. This required the addition of bespoke concrete foundations to support the machine as well as a reorganisation of the shop floor.

"We focus heavily on lean production whilst maintaining competitive turn-around times and best serving our customers, and the investment in this state-of-the-art equipment will enable us to achieve these standards. The grinder has also augmented the capabilities of our shop floor technicians who have received specialist operational training from Danobat."

\$1.5

MILLION

AERO NORWAY HAS INVESTED \$1.5 MILLION IN A DANOBAT MBTG-800 HIGH SPEED BLADE TIP GRINDING MACHINE FOR BLADE TIPS

PHOTO: HAECO



COMPONENTS

HAECO expands & acquires

HAECO Composite Structures in Jinjiang, China has added capability for preventive maintenance inspections and associated repairs on fan stator modules for GE90 engines on Boeing 777 aircraft. The scope of work includes ultrasonic inspections of composite panels and other metallic components of the fan stator module.

Preventive maintenance inspections of the fan stator modules for GE90-100/115 engines are mandated by the OEM to be performed on specified engines once they reach 50,000 flight hours. This new capability has been deployed by HAECO Composite Services on fan cases from a number of Asian customers.

Also in China, HAECO Landing Gear Services in Xiamen has attained Boeing 787 landing gear overhaul capability in advance of overhauls becoming due on regional and international Boeing 787 fleets. In addition to the Boeing 787, HAECO Landing Gear Services holds MRO capabilities covering a wide range of aircraft, including all series of Boeing 737, 747 (including the 747-8), 757, 767, 777

and Embraer E190/E195.

Meanwhile, in the US, it has acquired Jet Engine Solutions (JES), an engine MRO based in Dallas, Texas, that specialises in quick-turn repairs and lease returns for commercial aircraft engines. The acquisition of JES forms part of HAECO's strategy to grow its Global Engine Support business. This includes the opening of a new GES location near Amsterdam. This facility is EASA Part 145-approved and located 20 minutes by road from Schiphol Airport. The other engine overhaul facilities are Hong Kong Aero Engine Services and Taikoo Engine Services (Xiamen).

Christopher Gibbs, HAECO Group Director, Components and Engine Services, said: "JES has a strong reputation within the engine maintenance business for quality and delivery in the United States, which will complement the HAECO Global Engine Support business. We are looking forward to integrating JES into our growing network of engine maintenance facilities and being able to expand the services we offer our customers globally."

CABIN
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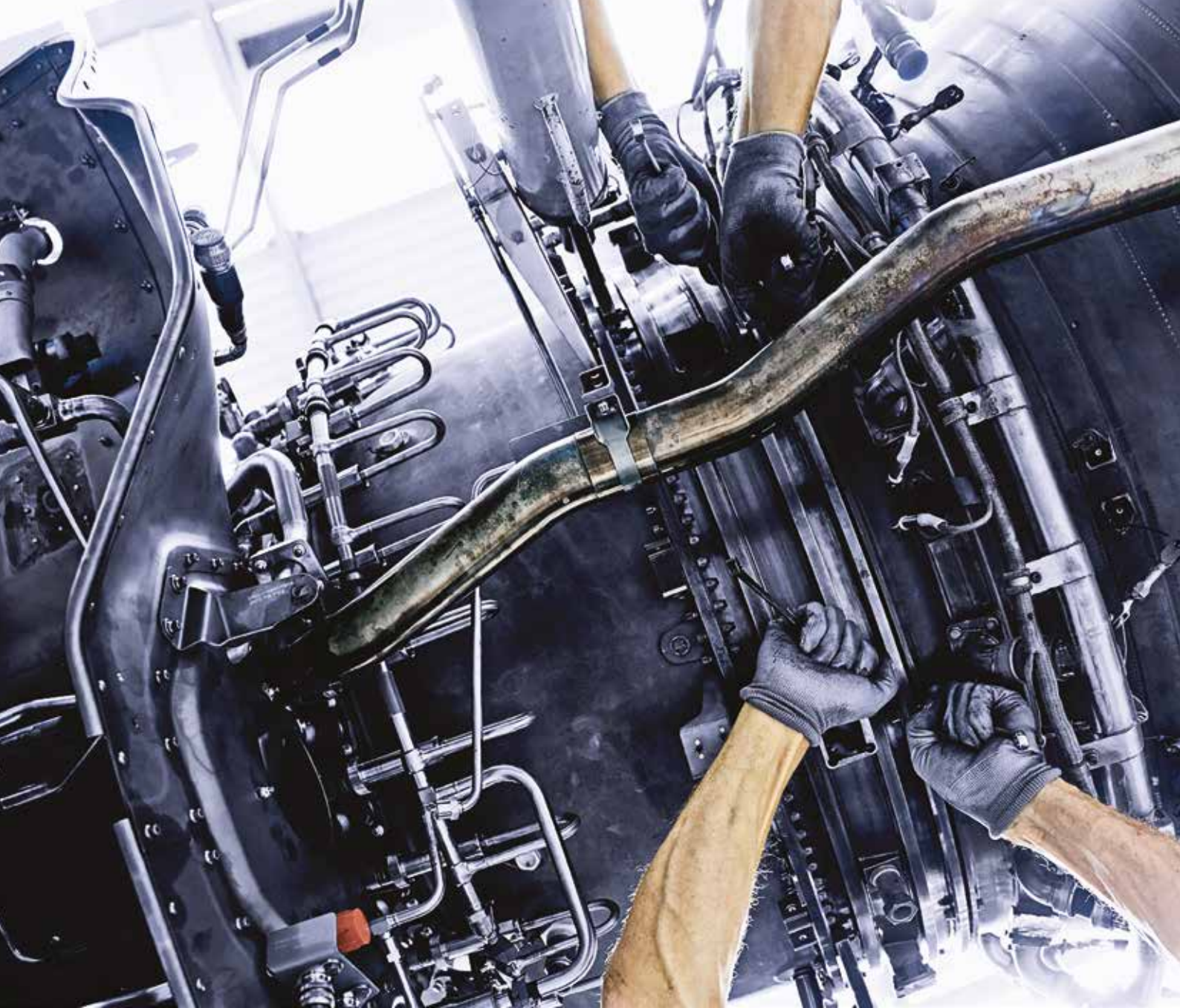


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Weather vane

The sheer size and diversity of the Lufthansa Technik organisation means its fortunes are a good indicator of how well the MRO industry is doing in general. So how was 2019?

5,018

AIRCRAFT UNDER
EXCLUSIVE CONTRACT

625

NEW CONTRACTS WITH
25 NEW CUSTOMERS

246

APPRENTICES AND DUAL
DEGREE STUDENTS

The company has now entered its 25th year, but 2019 saw record levels of revenue, which rose by 13% to €6.9 billion, while earnings before interest and taxes (adjusted EBIT) grew by around 11% to €493 million. That continued a trend that

has seen Lufthansa Technik's revenue grow by almost 60% over the past five years. Other operating income decreased by 4% to €260 million due to exchange rate effects. Overall, the total revenue generated by the MRO segment rose by 13% to €7,181 million.

Part of that came from the bread-and-butter work of aircraft, engine and component overhaul, which saw 25 new customers signing 625 contracts with new business worth €4.1 billion. In total, it is now looking after more than 5,000 aircraft from more than 850 customers. There was strong growth in America and in Europe, the company's most valuable market, with higher volumes in equipment and engine maintenance. Intra-group revenue increased primarily due to an increase in engine work for Lufthansa German Airlines.

Its international expansion has taken a new turn with the development of joint

In 2019, Lufthansa Technik's investment in new technologies increased by 28% to €313 million

ventures with major OEMs, including XEOS, a joint venture with GE Aviation for the overhaul of GENx-2B and GE9X engines, in Wroclaw, Poland (see MRO Management, February/March 2020) and EME Aero, with MTU Aero Engines, for Pratt & Whitney PW1000g GTF engine family overhauls, in Jasionka, Poland. Both opened in 2019. Its presence in Eastern Europe will be further enhanced by the opening in 2022 of Lufthansa Technik Miskolc in Hungary, a new addition to the Engine Parts & Accessories Repair (EPAR) network and will have around 400 employees. In Dubai, Lufthansa Technik Middle East has doubled its space to 5,000m² to meet the demand for composite repairs.

It is also responding to the increased digitisation in aviation, with further development of AVIATAR, its proprietary, independent and integrated software platform. More than 30 different modules are now available to operators to run complex fleet operations in real time and provide predictive maintenance for components. This has now been extended to the cabin, with the formation of AERQ, a joint venture with LG Electronics.

The company believes the international spread of its facilities means it can cope with the crisis and expects that the

industry will recover relatively quickly. Therefore, it is optimistic about the long term and expects the market to continue to grow at the previously forecast rate of 7% up to 2029, with growth areas being Asia and engine MRO. The latter may even reach almost 50% of the market by the end of the forecast period.

It says it has already start to prepare for the future by investing in new technologies (in 2019, investments increased by 28% to €313 million). This includes materials, manufacturing and repair methods as well as expertise, skills and new business models. This needed to meet expected consolidation in the industry as well as aggressive inroads being made by the OEMs, who see MRO as an attractive market.

Other challenges include the lack of qualified labour and how climate change policies might affect airlines in the future. **M**

MARKET FORECAST

Lufthansa Technik says the MRO segment continues to benefit from air traffic growth, with the market increasing by 8% to \$96 billion at the end of 2019. Growth was strongest in the Asia Pacific region (11% to \$31 billion). With an increase of 8%, growth in the EMEA (Europe/Middle East/Africa) rose by 8% to \$36.5 billion, while the Americas saw a more modest increase of 4%, worth \$28.5 billion.

It added that the challenging supply chain situation in the engine sector eased somewhat during the year as the problems with new generation powerplants were gradually resolved, but it says a close eye still needs to be kept on the situation. There may be increased demand for maintenance for aircraft that are still in operation in existing fleets where they have been kept in service for longer as a result of the Boeing 737 MAX grounding.

Finally, it adds that the grounding of long haul fleets during the crisis may lead to the usually quiet summer period for overhauls seeing higher demand than usual as aircraft return to service, perhaps with work being brought forward from later in the year.



Role Play

Sometimes an aircraft can be reborn in a different guise to its original intended purpose, says *Ian Harbison*

Left: A Swedish Coast Guard Bombardier Q300 drops a life raft during a training exercise. Photo: Swedish Coast Guard

You are no doubt aware of the aviation myth that the Tupolev TU-144 supersonic transport was built using stolen plans from the Anglo-French Concorde. The reality is, of course, somewhat simpler – in order to meet particular mission requirements, an aircraft design will necessarily incorporate certain elements enabling it to achieve those goals.

In the case of regional aircraft, it is the ability to operate into short or restricted airfields, or even to land on unprepared runways. As a result, common features are:

- A high wing, to keep engines clear of the ground and avoid ingestion of any debris that might be kicked up
- Good ground clearance
- A wide undercarriage track for greater stability
- Good slow speed handling
- The ability to land and take off in short distances
- A rugged airframe design.

It soon became apparent that these characteristics would also be useful if the aircraft was to be used for operations other than carrying passengers and freight. The most popular aircraft meeting these requirements were the ATR 42/72, Bombardier Dash 8 and Dornier 228, all turboprops, and the sole jet, the BAE Systems 146/RJ.

One of the most popular was offshore patrol, as nations looked to protect their 200nm Exclusive Economic Zone. Fishing fleets move with the fish as they migrate, so their positions were known during the year, but no fishing areas were also introduced to preserve stocks. By dispatching an aircraft, a quick and accurate check could be made and surface vessels called in if there was an infringement. Airfield performance meant that it could be deployed to a forward operating base at a small airport, perhaps on an island, further reducing time in transit. Another important aspect of this is the

A large jet engine is being moved by a crane in an aircraft hangar. The engine is the central focus, with its complex internal components visible. The hangar's structure, including beams and other aircraft in the background, is visible but slightly out of focus. The word "LEASES" is prominently displayed in large, 3D, metallic letters in the foreground, reflecting on the floor.

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Left: The 146-300 modified for use by the Facility for Airborne Atmospheric Measurements. Photo: BAE Systems. **Below:** Foreign fishing vessels invading territorial waters continues to be a problem. Photo: Shutterstock

Some aircraft doors were modified to drop smoke markers, life rafts and survival packs

conversion of range (a distance between two points) to endurance (or the amount of time that could be kept on station in the patrol area).

The aircraft also had to be equipped for their new role. That ground clearance made it a relatively simple matter to install a radar under the fuselage, optimised for detecting ships in sea clutter, usually backed up by an infra-red camera in a retractable turret for identification at night. Bubble windows were installed, which enabled an observer to put their head inside for a better external view and for photography. The view was enhanced by the high wing.

Communications had to be extended to cover maritime frequencies, and a sophisticated intercom system connected the crew – the mission commander in the cabin determines the targets to be investigated from the sensor data, directing the pilots to intercept.

Navigation equipment is upgraded for greater accuracy, not just for safety but to ensure that a complete package of evidence could be produced if there was a legal case – position data was superimposed on the IR imagery and the photography, clearly indicating that the vessel was in the wrong position and had committed an offence.

While the aircraft's slow speed performance helped it land at remote airfields, it had another benefit in the operational area. To identify a fishing boat and take photos, it is usually

necessary to descend to about 150ft and circle the vessel a few times. This could be done in complete safety as the wing was designed to accept the loads imposed during these manoeuvres, as well as the much bumpier operating environment at those altitudes.

Search and rescue sometimes plays a role as well, with the infra-red camera able to detect the body heat of survivors, while some aircraft were modified with doors that could be opened in flight to drop smoke markers, life rafts and survival packs. Navigation systems on these aircraft often included automatic search patterns that could be selected according to the nature of the incident, such as creeping line ahead or expanding square.

Time on station and the turbulent ride means that crew comfort is important, so

galley, lavatory and special seats were also important elements of the cabin design.

At the other end of the spectrum, the Fokker 50, another high wing twin turboprop, added to maritime patrol with a full military capability in its Enforcer variant, being able to attack warships with missiles and detect and destroy submarines. Turkey ordered a similar version of the ATR 72, but these are exceptions. Usually, these aircraft offered smaller countries a way of protecting vital maritime assets at reasonable cost. Foreign fishing vessels invading territorial waters continues to be a problem, and so demand continues at a low level.

Unlike many aircraft conversions, these were not based on extending the useful life of older airframes with decreased asset values. Instead, they were ordered as new production aircraft. However, turning them into special mission variants was outside the scope of the OEMs, who were solely interested in turning out standard passenger aircraft as quickly as possible. As a result, aircraft were delivered off the production line and ferried to specialist contractors such as Field Aviation in Canada and RUAG in Switzerland for the





Right: The Italian Air Force uses the P72-A for maritime patrol purposes. Photo: Leonardo

role equipment to be installed. This was a lengthy process, similar to that for the installation of a VIP interior on a large business jet.

The BAE Systems 146/RJ took a completely different route in becoming a special missions aircraft. It became a popular choice for companies in North America specialising in firefighting. A typical mission involves diving on a fire, dropping retardant and then climbing steeply away. This has been carried out by former military types such as the Lockheed SP-2 Neptune anti-submarine aircraft and the Lockheed C-130 Hercules transport. Operating very elderly aircraft in such extreme conditions resulted in a number of fatal accidents involving massive structural failures.

As plenty of airframes were available, the 146/RJ became a good replacement. Its performance meant it could locate to smaller airfields close to the fire locations, the sturdy structure meant it could withstand the turbulence at low level and the manoeuvres required, and it could carry a useful load of retardant. Airbrakes on the rear fuselage and a high lift wing enabled it to slow down to around 120kts to allow precise dropping of the retardant.

Modifications have included an external tank faired into the fuselage, as used by

The BAE Systems 146/RJ became a popular choice for firefighting in North America

Conair, as well as internal tanks that vent through doors cut in the lower fuselage, as used by Neptune Aviation Services. Both aircraft have a capacity of around 3,000 US gallons.

Another unique 146 aircraft is the UK-based Atmospheric Research Aircraft (ARA), operated by the Facility for Airborne Atmospheric Measurements (FAAM), a collaboration between the Met Office and the Natural Environment Research Council (NERC).

The 146-300 has been extensively modified to carry a range of instruments, including optical sensors, pressure transducers, external cameras and satellite communications. Ground time has to be built into the operating schedule to allow sensors and equipment to be changed for each programme. The cabin can carry a wide range of instruments on equipment racks and has space for up

to 18 scientists. The two flight crew are supplemented by a Flight Manager and a Cabin Crew Manager. A cockpit jumpseat is also available for one member of the science team. The airliner toilet and galley have been retained for comfort.

The result is a flying laboratory that has a range of about 1,800nm, a ceiling of 35,000ft and a maximum flight duration of more than five hours. It can be called on to fly at high or low level and in formation with other research aircraft. The aircraft retains its full performance, allowing it to operate into short or confined runways.

Last summer, it was involved in a two-week campaign collecting atmospheric samples over the North Atlantic to detect changes in key atmospheric components, such as ozone, methane and aerosols. These can impact UK agriculture, fisheries, transport and health.

In March 2020, it was to be operating over the Atlantic Ocean again, flying from Cabo Verde, to investigate a new source of pollutants, known as NO_x, which can cause lung disease and respiratory infection. These may be the result of a chemical reaction when sunlight shines on aerosol particles, such as dust, which carry nitrate over the ocean.

The only way to establish the process is by direct observation, hence the use of ARA. With the new requirements for ADS-B (see *MRO Management*, February/March 2020), the aircraft underwent an avionics upgrade last summer by Avalon Aero at Cranfield, where it is based. This will enable it to transmit its location to air traffic management for increased safety, not only for collision avoidance but also when it is over the ocean, off established airways.

Versatility is a hallmark of regional aircraft as demonstrated by those operating in new roles. **M**

A man with short brown hair and a light beard, wearing a white button-down shirt, stands in the foreground of a large aircraft hangar. In the background, a large aircraft engine is being worked on, and the hangar's structure with blue beams and lights is visible.

EXCELLENCE

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At Lufthansa Technik, excellence is part of our corporate DNA. For more than six decades we have been providing the technology that keeps fleets flying and turns a good aircraft into a great one. Today, we are proud that our company's name is synonymous with high quality and in-depth knowledge. And we continue to shape the aviation industry – by embracing new challenges and exceeding our customers' expectations.

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Lufthansa Technik

FIT TO SUIT

With facilities on either side of the Atlantic, MGT is finding different business models in different markets



Headquartered in Florida, where it was founded in 2002, MGT has developed close relationships with various landing gear overhaul shops throughout the Americas and Asia. In 2011, it opened a second facility at Aéroport de Toussus le Noble near Paris, from where it supplies customers in Europe and Africa.

Olivier Mongenot, CEO, says the two facilities are similar but operate in slightly different ways. In the US, demand is for brand new smaller parts, with sales being carried out worldwide. In Europe, it is the supply and support of life-limited and larger parts, such as actuators and pumps. Another difference is that the US market is more pragmatic, driven by business reasons, while

The US market is more pragmatic, while European companies put emphasis on their own way of working

European companies are more conservative, with more emphasis on their own way of working, expecting suppliers to prove themselves as dependable.

As opposed to new parts, larger components have to meet specific remaining aircraft versions, and MGT's activity in the market means it can often find sales outlets. This is an important part of the company's relationship with landing gear MROs. Most of them are focusing on their repair activity



and thus have less of a focus on turning their surplus or dead inventory. By focusing only on the landing gears, MGT has been able to sell items on the open market that had been held in stock for some time, generating revenues for both parties. MGT also has access to items that may not be widely available, as well as other surplus stock, which Mongenot says is a result of being recognised as reliable and trustworthy.

This has become an important part of the company's relationship with Safran Landing Systems. Since 2018, MGT Europe has been officially authorised to re-sell a selection of Safran Landing Systems landing gear spares and hydraulic component surplus and used stock. The programs involved include the major aircraft and helicopters families the OEM has been working on.

In return, used material purchased by MGT is also sent to landing gear MROs for inspection and/or refurbishment and then returned to MGT with proper certification.

That reputation is further enhanced by holding ISO 9001: 2015 certification, meaning a quality assurance system is in place and those elements of reliability and trust are equally reflected in its own choice of suppliers, manufacturers, distributors and repair stations, with regular audits by its own quality control department.

He adds that Safran Landing System's own repair facilities worldwide have become more aggressive in the market and the relationship means they will often come to MGT as a source for spares demand, helping each other.

Of course, Safran Landing System was

MTG's reputation is enhanced by holding ISO 9001: 2015 certification, meaning a quality assurance system is in place

Above: MGT selected the A320 Family as there is a huge fleet. Photo: Ian Harbison.



MGT's strength in the US market saw it establish an Aero Distribution business unit in 2014

the original manufacturer of the landing gear for the Airbus A320 Family. This is the basis of the relationship as a decision was made in 2005 to focus MGT on this product range, as the huge numbers of aircraft in service made it an attractive market. The Boeing 737 is around in similar numbers, and MGT does have an involvement, but the OEMs work in different ways and MGT's preference is for the European approach.

It has also become involved with a number of regional aircraft, such as the ATR 42/72, Dassault Falcon business jets and Dauphin and Super Puma helicopter landing gear but this remains a small part of the business.

Recently, there has been an interest in the Airbus A330/A340 family (especially the Growth versions). This market is much smaller than the A320 Family, with fewer aircraft, meaning it can be hard to find life-limited parts for MROs working on such overhauls for these landing gears. Here, again, MGT can be the right partner to locate parts thanks to its specific knowledge of landing gear

maintenance landscape. This is valuable since these parts are usually at higher risk and need greater investment, especially as teardowns of these aircraft types are much less common, therefore creating a scramble for removed parts.

The company's experience is recognised in other areas as well, allowing it to offer services such as AOG support, repair and overhaul management, parts exchange pools, inventory consignment, customised kits and storage and distribution.

In the latter case, its strength in the US market saw it establish an Aero Distribution business unit in 2014, dedicated to helping smaller European manufacturers to market and distribute their products. Clients include ARV (quick release pins and tooling), Caillau (clamps), SKF (bearings, bushing and ball assemblies) and Stacem (seals, O rings and moulded parts).

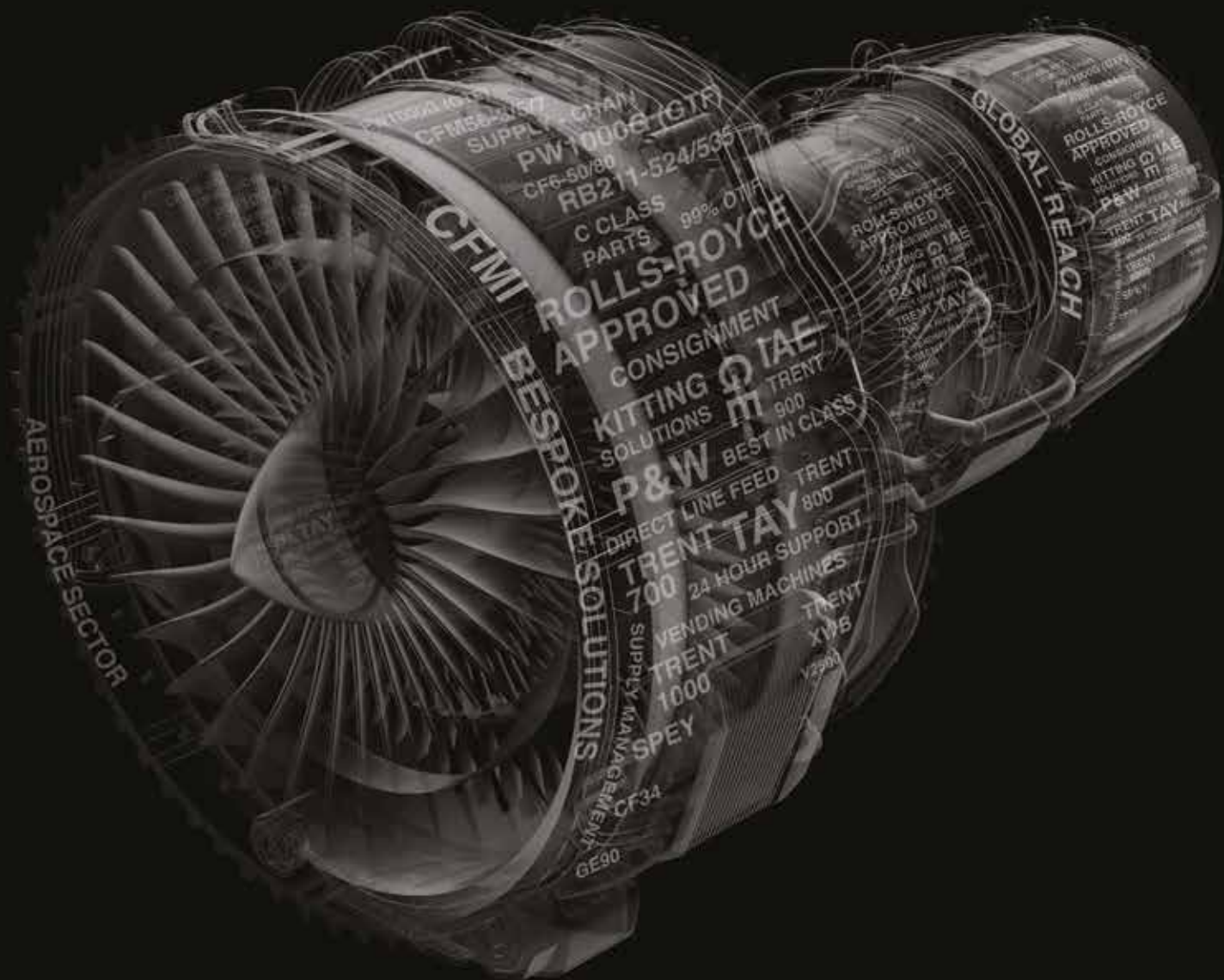


THOUSAND FLIGHT CYCLES

WITH LANDING GEAR OVERHAULS GENERALLY BASED ON TEN YEARS OR 10,000 FLIGHT CYCLES, ANY SUSPENSION OF FLYING PUSHES THOSE DATES TO THE RIGHT

Mongenot says the company has steadily improved its performance in the last few years, as has the MRO industry in general, with 2020 looking strong at the start of the year. Of course, uncertain times now lie ahead. With landing gear overhauls generally based on ten years or 10,000 flight cycles, any suspension of flying pushes those dates to the right. While the cargo industry is flying heavily right now, MGT really needs the narrowbody passenger fleets to get back in the air. Mongenot says the business is still going well but, at the time of going to press, there were signs of a slowdown developing. Another challenge for international companies is that local and government health requirements can differ to a large degree, so France is in lockdown while the US is more relaxed for the present. 

Above: The relatively small market for the Airbus A330 can make it hard for MROs to source life-limited parts. Photo: Airbus **Left:** MGT offers a range of services including AOG support, parts exchange pools and customised kits. Photo: MTG



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Landing gear work is less affected by the current crisis as maintenance is calendar-based. All photos: REVIMA

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REVIMA is coming to terms with a rapidly changing situation and reconsidering its future strategy

Olivier Legrand, President of the REVIMA Group, says 2019 was a good year for the company. Landing gear overhauls hit an all-time high, with over 400 legs passing through the facility. APU work was flat, which had been expected but, at over 500 units, this was a more than respectable number.

This year, which was also expected to be another high growth year, kicked off with one significant contract win and a new collaboration. The first was a six-year exclusive contract with Sharjah-based low-cost carrier Air Arabia for 40 shipsets of Airbus A320 landing gear. The second was a collaborative agreement with Malaysian Airlines to provide landing gear replacement services for REVIMA customers at the airline's hangar in Kuala Lumpur. In turn, REVIMA would support landing gear overhaul services for the airline's MRO customers at any of its facilities.

Both parties will also have a role in marketing and promoting their joint services to airlines within the region.

Another key element of REVIMA's 2020 growth was the newly constructed landing gear overhaul facility in Chonburi, Thailand. This has been delayed as some of the machinery was still being installed and engineers are currently not able to visit and carry out the work. Of course, representatives from the certification authorities have similar travel restrictions. Fortunately, training can still continue to be carried out.

Plans for REVIMA Engine Parts Repair are also under review. This was the former Chromalloy France facility in Saint-Ouen-l'Aumône, northwest of Paris, which was acquired last year. It specialises not only in APU component repairs but some powerplant components as well, extending REVIMA's competencies. It also has equipment for special coatings, brazing, welding and machining as well as additive manufacturing capabilities.

In the meantime, work still continues at the company's main facility at Caudebec-en-Caux in Normandy, between Le Havre and Rouen. Legrand is pleased with the way the company and the personnel have reacted to the virus, redesigning work stations to allow for social distancing and avoiding overlapping shift patterns.



There could be opportunities in the used serviceable material market as aircraft are broken up

Above, right & below: REVIMA personnel have adapted work stations to allow for social distancing and are avoiding overlapping shift patterns

He notes that landing gear work is less affected at the moment as maintenance is calendar-based – it will simply shift as aircraft return to service. APUs are maintained on condition, so if they are not being used, there is no demand. However, the company has a number of cargo operators as customers who will be flying as much as they possibly can, so there is some work to be expected, although some workers have been furloughed.

The return to normal air services will be interesting and challenging, he says. Demand will certainly recover in the long run, but initially location and frequency will depend on where and when travel restrictions are lifted. He expects airlines to start using newer aircraft as they will have less of a maintenance burden but deferred deliveries of aircraft on order could see older types stay in service as an interim measure and that would generate additional MRO demand.

Another question is which aircraft will not return to service. He cites the example of Lufthansa, which has announced that it is decommissioning six Airbus A380s, seven A340-600s, 11 A320s and five Boeing 747-400s. Lufthansa Cityline will withdraw three Airbus A340-300s while Eurowings will retire 10 Airbus A320s. REVIMA is exposed on the A380 APU, and although the 747-400 passenger market drop was



already factored in he thinks that the 777-200 may be another type at risk. However, there could be opportunities in the used serviceable material market as aircraft are broken up. Again, customers for the older types in the REVIMA portfolio are mainly cargo operators, so he sees demand continuing.

While there is inevitably some uncertainty about what the future will bring, he praises the confidence, dedication and commitment of the employees and the full support of the shareholders and financial partners. This is a time for review, he concludes, and it may be that REVIMA will decide to go after new opportunities as the market recovers. **M**





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OPENING THE DOOR

Opening a new facility offers the chance to provide creative and supportive training for new recruits



Mick Adams, Senior VP and CEO of STS Aviation Services, has a deep commitment to provide quality training and solid career development for his technicians and engineers. His latest task is to get a maintenance hangar up and running in

Birmingham in the UK (see MRO Maintenance, February/March 2020), including recruitment of new staff.

The hangar was previously under his control when he was Managing Director of Monarch Aircraft Engineering but the restart comes without the previous company's legacy practices. That means he can start with a clean sheet and establish a structure that is leaner, stronger and more flexible. That is not to say that things were all wrong before – a two-day recruitment produced more than 350 applicants, many of whom were previous Monarch employees. Some had moved away to new jobs but were willing to return for personal reasons, others had stayed locally

but wanted to come back to the hangar.

The aim was to recruit up to 100 people by the end of 2020 and 250 by the end of 2021, although this has now been deferred by circumstances. Each successful applicant has been contacted personally and he says they are understanding and can wait.

Another pleasant surprise in the recruitment process was the number of B2 engineers with avionics experience – an increasingly rare breed. This is vital as the facility, which received CAA Part 145 approval to conduct base maintenance operations in March, is not intended to run nose-to-tail heavy checks but to specialise in

Top right and right: Brand new STS recruits will benefit from the innovative Career Passport, giving them ownership of their career path



A pleasant surprise in the recruitment process was the number of B2 engineers with avionics experience





Adams plans to introduce engineers to management review meetings to gain insight into the company's direction

Far left, left and below: STS recruits will gain hands-on training across a range of maintenance procedures rather than specialising at an early stage, and will be examined by a range of inspectors to fully assess their abilities

can be some time before feedback is received and discussed in the hangar. If it was an internal problem, that means a delay in identifying and rectifying the cause. If it was a problem with the customer, perhaps late delivery of spares, that might not be known to management. Either way, face-to-face meetings with the end user can be educational and confidence building for mechanics and shows trust in them by management.

A similar situation exists with engineers, where gaining a licence is similar to becoming a Lead Mechanic – there are suddenly a lot of expectations and involvement in previously unknown areas, all without formal training. Some have experience in areas such as people management, as they will have been leading a team of mechanics, but it is the business side that is usually lacking.

Areas to be covered include safety, company infrastructure and the business itself, including, once again, customer relations. To meet these needs, Adams plans to introduce engineers to the regular management review meetings. That would see up to 24 people attending over the course of a year, gaining insight into how their actions can have a consequence and also why decisions are being taken that affect the day-to-day

modifications, structural repairs, engine changes, A checks, C checks, lease transition and bridging checks. Those are short notice tasks with tight turnaround times, so that new structure is even more important.

For brand new recruits, as Entry Level mechanics, an innovation will be the Career Passport. This is an actual document, he says, not electronic, and looks and feels like a passport to give them ownership of their career path for those that are determined to progress. He points out that some people prefer to stay at the same level and do a good job on a daily basis.

The passport contains a variety of tasks that have to be signed off by an inspector when completed to their satisfaction. In this way, mechanics will gain experience across a range of maintenance procedures, rather than specialising at an early stage of their employment and perhaps staying in one section – Adams would prefer an engine change specialist to also have some knowledge of flight control surfaces, for example. By involving several inspectors, the mechanic is also subject to examination by different people, bringing a wider perspective to the assessments of their ability.

After 18-24 months, the successful Entry Level mechanic can make the transition to Tier 1 mechanic and continue to build up stamps in the passport. After a further year comes the upgrade to Lead Mechanic. This is where Adams feels that support has been lacking in the past.

Suddenly, people management skills become a key requirement, while the additional responsibility brings pressure. Usually, there is no formal training programme so newly promoted people are thrown in at the deep end. The passport ensures that a much wider exposure across the company and over time helps to develop those attributes as part of the process. He says the company also has to make training available, with troubleshooting and systems testing being vital to identify and correct a technical problem as quickly as possible.

This is also a good time to let them meet the customer to discuss how a project went, either good or bad. If there were problems on a particular aircraft, it





Candidates are encouraged to develop their current skill sets or acquire new ones

Combining technical and business knowledge should develop future leaders with a rounded set of talents

running of the company. As that then gets transmitted back to the hangar, there should be a greater understanding of where the company is going and why. For the individuals, it once again provides practical training that may not be on a syllabus, but is perhaps more useful for that very reason.

Another important element of Adams' approach is helping people at any level in the company to develop themselves. This might be paid time off work to attend a course, additional training if a weakness is identified, or even funding to help with a degree course or similar. In the latter case, he points out that it must have some benefit for the company and so be aerospace-related. That means a

candidate can be steered towards acquiring a skill set that then has some industrial benefit.

He uses the example of an aeronautical engineering degree, where the candidate might be asked to look at 3D printing as a specialisation. This is at a research phase at STS at the moment, but the candidate could also become part of the early project team as an incentive. They would get the best of both worlds – real-life, hands-on experience to help their course work alongside knowledge of the latest techniques and developments.

Many engineers go into management at a later stage in their careers, but that lack of formal training in business skills is having an effect throughout the industry.

Finding suitably qualified and experienced people for his senior team was the biggest challenge for Adams, harder than finding the hangar staff. That may also explain the apparent revolving door at this level between MROs around the world. It will take some time, but this holistic approach to combining technical and business knowledge should develop a generation of future leaders with a much more rounded set of talents.

Finally, Adams says the training procedures will be rolled to the Newquay facility, as part of a wider process in aligning the company's UK operations. He also adds that the Career Passport has generated some interest with the parent company in the US. **M**



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A LIFE IN THE DAY OF...

We speak to *Mimi Correa*, Director of Fleet Management at Revima

What is your typical day to day activity?

Typically, I wake up early, get coffee, check out the world news and then team together with my Revima colleagues and review our customer's APU operational health news. Revima utilises a set of online tools that predicts and visualises real time APU health alerts. Our sister company Flight Watching provides the latest web-based software technology, and Revima has the expert knowledge, which combine to give highly effective predictive maintenance solutions.

A large part of my time is spent with Flight Watching and Revima's fleet management team, to sharpen our tools and skills through adapting the latest predictive technology along with our expertise on leading maintenance indicators to improve APU on-aircraft availability and operating costs.

How did you get into aviation?

My mother was a Chemistry Professor at Embry-Riddle Aeronautical University. Mathematics and science were my favorite subjects. I had a talent for them and studied engineering and computer science. I graduated and joined General Electric Aircraft Engine Group in Cincinnati, Ohio working in development test and evaluation.

I was hooked on aviation. I enjoyed the hands-on environment of development, building, testing, and repairing engines. As the engines were in research and development, there were many learning opportunities, and I gained a wealth of experience. It was an intimidating environment, but I had several mentors

who gave me the support and encouragement I needed to prove I was as capable as my male colleagues. Of course, I had some difficult times, but for the most part, my large family of six brothers and a sister prepared me with the tools and sensitivities I needed to navigate a male-dominated career.

What attracted you to aviation as a career?

In high school, I wanted to be a marine biologist and work with Jacques Cousteau, but my mother encouraged me towards a more practical field. She showed that you could do anything you set your mind to; and more than you thought possible.

She created a new curriculum in the area of environmental science, as she went back to school to get an additional degree in chemistry, all the while taking care of my father who had suffered a stroke. Following her lead, I believed that with hard work and education anything was possible. Also, growing up in Florida, near the Kennedy Space Center, I learned to love space exploration and Star Trek.

What was the most professionally satisfying experience of your career?

For me, it has never been about money or job titles, but in solving a problem and earning the recognition of my peers. I enjoy collaborating, solving problems, and taking calculated risks. In the early 1990s, while at United Airlines as a young engineer, I worked as part of a team that qualified the Boeing 767 for extended twin engine operations (ETOPS). It was a challenge to get the APUs in the

configuration needed to ensure it could reliably start when cold-soaked for four hours at 30,000ft, as required for ETOPS operation. I had the opportunity to fly around the country to work with flight and maintenance crews to improve APU start reliability and availability. I was in my late twenties, a mother of a toddler, with a husband who was also travelling for work. It was challenging but rewarding and gave me the recognition and confidence to accept more challenging and leadership positions.

What was the most personally satisfying experience of your career?

At United Airlines, I worked with a team of talented engineers and we were tasked with finding out what was causing engine





Left: Collaboration with everyone from designers and engineers to operators and mechanics is essential
Opposite: Revima utilises a set of online tools to predict and visualise real-time APU health alerts.
 All photos: REVIMA

heavy repairs to have unreliable performance margins. It took us six months to find the primary culprit, which created a profile shift in the exit gas temperatures. Along this journey, we also found many other opportunities for improvements. This problem-solving led to implementation of statistical process control, where I found my passion which I continue to utilise today in Revima Predictive maintenance tools. Data-driven problem solving and statistical analytics is the key to predictive maintenance.

Good data collection and cool analytics without knowledge of the system will create unnecessary burden on an airline, with little cost improvement while wasting effort. I have spent my work life trying to prevent APU issues on aircraft and now I have the tools in real time through Flight Watching with the expertise to provide prescriptive maintenance with a high degree of confidence. Providing these real and timely savings to our customers is quite satisfying.

What advice would you give to a young person looking for an aviation career?

For aviation, like any career, if you want to enjoy it and feel rewarded, you must put in the time and hard work of developing your knowledge and your network. Collaborate not only with designers and engineers, but also those that operate and repair the system.

Data and collaboration are key. There are no new ideas, we build from others and make them our own for a moment in



I've spent my work life trying to prevent APU issues on aircraft... now I have tools through Flight Watching

MIMI CORREA
 DIRECTOR OF FLEET
 MANAGEMENT AT REVIMA

time and, with luck, those ideas are improved upon by the next generation. Continuously collect data, validate your assumptions and change them as the science and analysis informs. Know your system and hardware, especially in the used condition, to inform your understanding with reality.

What are the biggest changes in the industry you have seen over the years?

Airlines and OEMs have outsourced a lot of their knowledge to subcontractors. This outsourcing also transitions the expertise to the subcontractors. In addition, people move from company to company more frequently, and their knowledge moves with them. It is important for companies to capture such experience and knowledge into expert systems that new personnel can learn from and build upon.

What do you think will be the biggest future challenges to the industry?

I remember flying to Seattle sitting next to 3 young 'techies'. They began a conversation on how exciting the cell phone industry was and compared it to the boring aircraft that never changed, while cell phones and the tech economy were revolutionising the world. They were not impressed that they were flying at 30,000ft in a wonderful marvel of ingenuity, and how designers' passion for safety and the skills of the pilots, flight attendants and mechanics were critical to themselves and their tech economy. It made me proud to be part of aviation and how, for the most part, the flying public take it for granted.

COVID-19 will change what our workplace looks like and change the demand of business and tourism travel for several years to come. This is likely to create financial pressure on the industry greater than observed in the last few decades. I suspect environmental concerns will continue to put pressure on travel and aviation in the future as well.

As the aviation industry returns to normal operations, we will need to ensure good practices of the past are integrated with the ambitious cost savings initiatives to come. Those of us getting ready to move forward from our long tenure in aviation must gift our experiences, knowledge and safety culture to the next generation for them to build and improve upon. The public has entrusted us in the aviation industry with their safety, and we need to earn that trust every day with every decision we make. 🛩️

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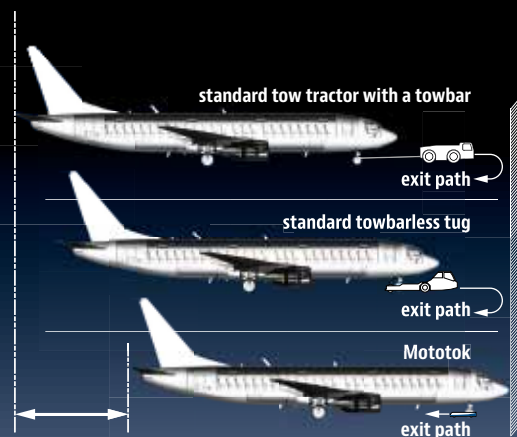
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DEEP CLEAN

Aircraft cleaning has gained prominence in recent weeks as airlines announce enhanced procedures as part of their action plans to help contain COVID-19. That does beg the question what happened before? The answer is quite a lot

There have been a few health scares over the years, most notably SARS in 2002/3. Like the current pandemic, it is a coronavirus that is spread in small droplets of saliva coughed or sneezed into the air by an infected person. It can also be spread indirectly if an infected person touches surfaces such as door handles with unwashed hands.

Passenger 'expulsions' are the main source of any harmful organisms in the cabin, and studies over the years have shown just how far a sneeze, for example, can travel in a confined space. Similarly, studies into outbreaks on aircraft of norovirus, the vomiting bug usually associated with cruise ships, have tracked the way passengers carry the

virus from the lavatory to the toilet door handle to the seat back (probably touching several as they make their way back through the cabin) and finally to the tray table. That means cleaning can be targeted to some extent.

The SARS outbreak also saw airlines respond by fitting HEPA filters in the environmental control systems of their aircraft. These highly efficient filters, which have become fairly standard, can remove 99.97% of particles less than 0.4 microns in diameter, which includes bacteria and viruses as well as dust, allergens and microbes. Combined with higher cabin air refresh rates, the cabin has become a safer place.

Social patterns can also play a part. Cabin designers are being pushed towards incorporating touch-free controls in lavatories as this is a distinct preference in the Asia Pacific region,



Above: A team of 36 workers is needed to clean an Emirates Airbus A380 during a one-hour turnaround. Photo: Emirates

Right: Seat belt buckles have been identified as a passenger touch point requiring an extra level of cleaning. Photo: Southwest

Below: Every section of the aircraft interior is targetted in a deep clean. Photo: Southwest



The disinfectant used leaves a long-lasting protective coating against viruses, bacteria and fungi

also the largest passenger market. Anti-microbial materials in lavatories have also started to appear, with silver being a well-established solution used in other sectors.

There has been increased recognition in recent years that a smart cabin enhances not only the passenger appeal on that particular journey but can give an impression of a newer and safer aircraft and hence a better airline. As a result, cabin appearance teams have been established, carrying out regular checks and instigating immediate remedial action if a problem is found.

This is often achieved by having a van stocked with the most common problem items available airside, allowing them to then be rapidly dispatched to the gate where the aircraft is located. Overnight checks now often include cabin work to ensure the interior is neat and clean for the first flight of the day. Premium cabins also require additional work to maintain their luxurious appearance. An added benefit is that the cabins are cleaner.

However, cleaning crews sometimes have to compete for space with catering and maintenance personnel, especially during turnarounds. This can cause





Above: If COVID-19 has been suspected onboard, Emirates replaces all HEPA cabin air filters. Photo: Emirates

Right: Current deep-cleaning practices cover everything from windows to armrests. Photo: Southwest

Below: Soft furnishings are misted as part of a process of disinfection. Photo: Delta

congestion, and the cleaning may not be as effective as a result. The crews also face unusual hazards on a daily basis. Passengers do not discriminate about what they leave in and around their seats, and items can range from the dangerous to the disgusting. Seat designs that incorporate literature pockets at the top of the seat back, featuring cut away corners to show what is inside, have proved increasingly popular.

To provide extra protection in flight, Air France and KLM provided their cabin crew with cleaning wipes, vinyl gloves, disinfectant sprays, protective masks and cleaning kits consisting of gloves and wipes.

Emirates put some numbers on its cleaning processes, which covers 248 aircraft every day. Within a one-hour turnaround, a team of 18 will go through a Boeing 777, while it takes 36 for an Airbus A380.

If an aircraft has transported a suspected or confirmed COVID-19 case, Emirates go even further by implementing deep cleaning and disinfection in a process that takes between six to eight hours to complete. This includes the fogging with disinfectant of cabin interiors and misting across all soft furnishings, and replacement



of seat covers and cushions in the affected area. The aircraft's HEPA cabin air filters will also be replaced.

Southwest Airlines says their aircraft routinely undergo more than six labour hours of cleaning every night, while Delta says the overnight cleaning procedures are now used before every flight, overseen by a Customer Service Agent and a Flight Leader to ensure the aircraft is up to what it calls the 'Delta Clean' standard. It adds that they are empowered to request a cleaning crew to return to the aircraft for additional cleaning.

The current deep-cleaning approach by the airlines covers a wide range of areas. The more obvious ones include windows, tray tables, seatback screens, armrests, seats,





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in-seat controls, panels, air vents and overhead lockers, as well as lavatories, galleys and crew rest areas. However, seat belt buckles are now also receiving attention as they are another touch point, while some airlines have removed cushions and reading materials.

Rick Lockhart, President of SkyPaxxx, which manufactures carpet tiles for aircraft, points out how much gets spread across the floor from passengers' shoes. If they stow their bags under the seats, it then passes to their hands. He explains that his product has a permanent, proprietary antimicrobial certified by the US Environmental Protection Agency as well as a dry cleaning foam that ensures proper coverage and has a prescribed contact time to be effective.

This needs to be considered as low cost and leisure carriers often carry out much more frequent carpet replacement due to the high footfall in their daily operations, especially in gangways and entrance areas. In fact, one leisure airline requires a deep clean of the cabin every seven days during high intensity summer operations, but extends the interval to 14 days in winter.

Another effective antimicrobial treatment is silver. Silver ions are highly reactive and interrupt vital processes in the bacterial cells, ultimately killing them, while having no effect on human cells. Products containing silver, such as ALEXIT FST, a top coat from Mankiewicz, have been increasingly used in lavatories, showing continuous protection for several years.

Aircraft operating in high risk health areas have always been disinfected as a routine, such as cabin crew walking through the aircraft spraying insecticide on services from India, but this has now been extended to regular operations. Indeed, Delta started overnight fogging with disinfectant on all domestic aircraft at the start of April, having started the procedure on international aircraft in February. Like other airlines, the disinfectant is similar to those used in hospitals and leaves a long-lasting protective coating on surfaces against new contamination of viruses, bacteria and fungi. 



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Many ATR operators are in remote areas and islands. All photos: ATR

STAYING THE COURSE

The ATR family is one of the longest serving in the regional airline industry but support has been changing to match changes to the aircraft

The ATR 42 first entered service in December 1985, followed in October 1989 by its larger sister, the ATR 72. The company, now jointly owned by Airbus and Leonardo, will be celebrating its 40th anniversary in 2021.

Last year, it achieved orders for around 80 aircraft, compared to 52 orders in 2018 and 113 in 2017. That included 35 from leasing company NAC (which also took 35 options and 35 purchase rights), a trend that has become apparent in recent years as the aircraft is seen as a good investment. That is partly because the aircraft has found a niche market.

The only real competition is the Dash 8-400 from De Havilland Aircraft of Canada (which is the Bombardier Q400 rebranded following its acquisition in September 2018). At the same time, there are many regional turboprops coming to the end of their service life that need to be replaced.

NO PAX PLEASE

The freighter market is expected to grow in response to e-commerce expanding at 19% per annum. In addition, second tier cities are not well connected. There are more than 120 converted ATRs and there is plenty of feedstock, as the residual values of older aircraft are now decreasing to the point where conversion is economically viable and attractive but new build freighter aircraft are also possible.

This year will see the delivery of the first of 30 ATR 72-600Fs ordered by FedEx in 2017 (It also holds 20 options). These will be the first to be produced in Toulouse with the Large Cargo Door (an STC originally developed by Aeritalia and then acquired by IPR, itself recently acquired by ACIA Aero Capital).

With a payload of 8.9 tonnes, it is the largest turboprop freighter on the market. The fuselage cross section means it can carry seven LD3s or five 88in x 108in pallets or nine 88in x 62in pallets, plus bulk cargo in the rear fuselage. However, the ATR 72-600F makes sense for the big integrators as using smaller aircraft means smaller airports become available as distribution centres closer to the end customer, ensuring fast delivery times.

8.9

T O N N E S

WITH A PAYLOAD OF 8.9
TONNES, THE ATR-72
600FS IS THE LARGEST
TURBOPROP FREIGHTER
ON THE MARKET



It might be thought that in the ever-growing aviation industry, this bottom sector would have declined over the years, with propeller driven aircraft being replaced by jets but, again, the ATR family has a particular niche. A significant number of the 200 ATR customers operating in 100 countries are small airlines with small fleets, located in remote places, many on islands.

The only turboprop replacement is another turboprop and Embraer has been discussing such a new project for some years, so there may be competition in the future. At the same time, many other customers also operate Airbus A320/Boeing 737 aircraft, using the turboprop on feeder routes into hub airports to connect to jet flights.

In fact, the development of shorter air routes suited to turboprop operations (around 300nm or less) is set to grow according to Zuzana Hrnkova, Vice President Marketing at ATR. She points out that 58% of the current worldwide regional network did not exist 15 years ago and a further 2,700 routes are predicted in the next 20 years as developing countries improve their domestic networks and a growing middle class can afford to fly.

In addition, she says 30% of the world's 3,800 airports have scheduled services that are provided exclusively

The development of shorter air routes suited to turboprop operations is set to grow

by turboprops. As an indicator of the growth trend, she adds that ATR operators added 150 new routes in 2017 and 113 in 2018. Overall, ATRs are used in 75% of all turboprop operations and 36% of combined turboprop and regional jet operations.

To meet the demanding operational environment of some of its customers, the company has been introducing improvements and modifications to make flying in those regions safer and more efficient. A good example of this is ClearVision Enhanced Vision System (EVS) from Elbit Systems.

Using a multi-spectral sensor system mounted in the nose of the aircraft, it produces a synthetic view of the outside world in reduced visibility or night operations, overlaid in the pilot's Skylens head-wearable display or head-up display with flight information. The first aircraft equipped with the system (and the first of three on order) was delivered to Guernsey-based Aurigny in October 2019.

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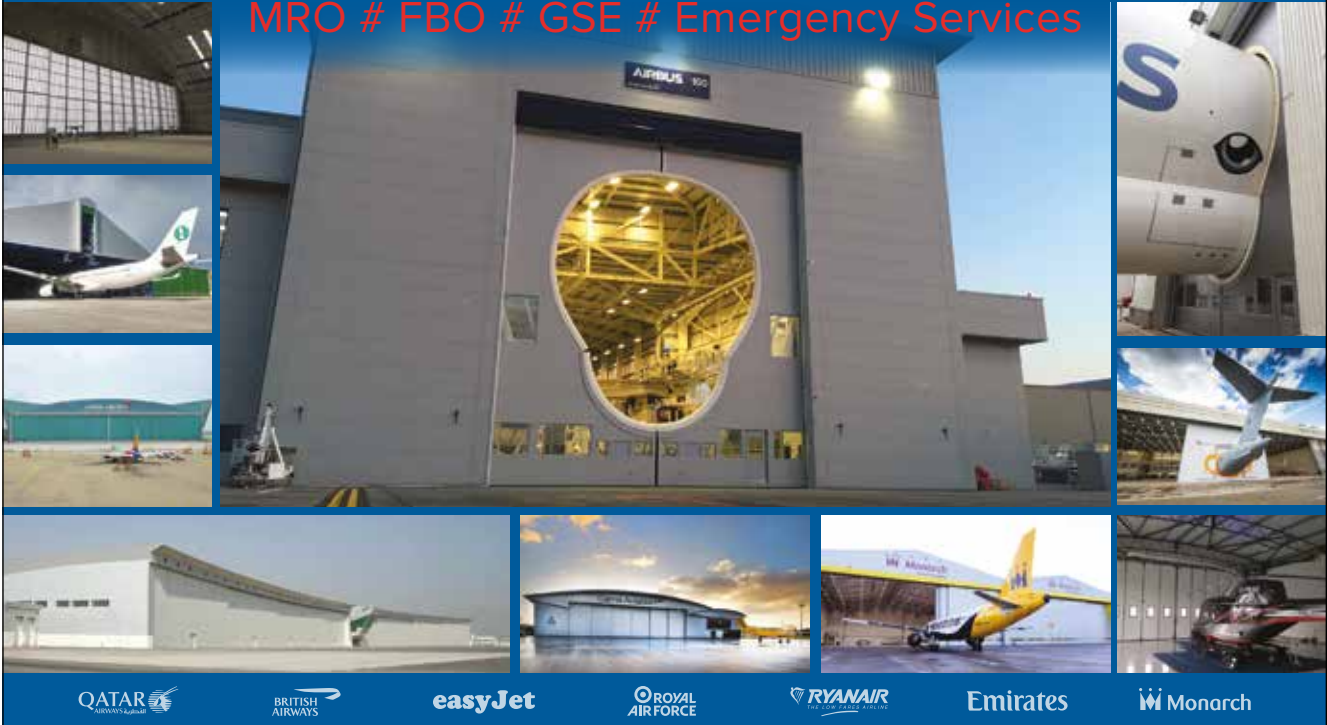


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The ATR 42-600S will be able to use runways as short as 2,625ft with 40 passengers on board

Above: The ATR is also used to feed long haul flights at major hub airports.

Below: The Armonia interior is popular with passengers.

The Channel Islands are susceptible to fast moving fog that can disrupt airline schedules very quickly.

This has been combined with the Standard 3 avionics suite, which features an Inertial Reference System from Thales that provides RNP-AR 0.3/0.3 (Required Navigation Performance with Authorisation Required). This means that the aircraft can be accurately flown inside a flight corridor that is just 0.6nm wide (0.3nm is the half-width), especially useful in narrow valleys in mountainous areas or tightly controlled airspace in congested areas. It was

developed with active participation from Air New Zealand.

In response, in October last year, the ATR 42-600S was launched, the S representing Short Take-Off and Landing (STOL). The aircraft will be able to use runways as short as 2,625ft with 40 passengers on board in standard flight conditions (15°C airfield temperature, sea level, dry paved runway and a route of 200nm).

The principal modification is a larger rudder, which provides increased control at lower speeds, while symmetrically deployed spoilers and an autobrake system will reduce the landing run. The power rating of the Pratt & Whitney Canada PW127M turboprops can be switched to the higher level of the larger ATR 72-600 version for take-off from short runways, then operated at a lower level for the rest of the flight or operations into larger airports.

To date, ATR has recorded more than 20 commitments from operators and lessors for the ATR 42-600S, including Elix Aviation Capital, Air Tahiti and PNG Air. Certification is expected for the second half of 2022, with first delivery expected immediately afterwards.

ATR says there are close to 500 airports with runways between 2,625-3,280ft, nearly a third of which are in Asia Pacific. This represents a 25% expansion of the market for the aircraft.

The cabin retains the Armonia design





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ATR has recorded over 20 commitments from operators and lessors for the ATR 42-600s

Right: The ClearVision Enhanced Vision System produces a synthesised view of the outside world when required. **Below:** Air Tahiti is adopting the new Expliseat, which offers a 300kg weight reduction

from the Italian design house Giugiaro, development of which started in 2009 along with ATR and seat manufacturer Geven, which supplied its Prestige and Privilege models. In 2017, they were replaced by the Neo Classic and Neo Prestige. As well as offering more comfort – some ATR routes can be several hours long – it also gave airlines an opportunity to introduce a two-class configuration. As the passenger entry door is at the rear of the aircraft, premium seating is usually at the back as well.

Another aspect of the new seats was increased space, with the standard configuration for an ATR 72-600 changing from 70 seats at 30in pitch to 72 seats at 29in pitch. They also offered a 200kg weight reduction per shipset, but for airlines seeking even more, there is the option of Expliseat, which has a composite and titanium construction offering a 300kg reduction. Customers taking the option include Cebu Pacific, Air Tahiti and Air Caledonie.

As noted above, there are some long routes but the average is around 60 minutes, so 2018 saw the introduction



of a simple wireless IFE system that fits in an overhead bin. As well as amusing passengers, it can also provide useful ancillary revenue for operators.

The company also takes inclusivity very seriously. Every aircraft has an onboard wheelchair to ease seat access; safety instructions in Braille; and, introduced last year, Audioback, which enables passengers with hearing aids equipped with a Telecoil to hear inflight announcements via a magnetic field signal from a loop embedded in the seat headrest.

Support

The far flung customer also presents challenges for the support side of the business, says Laurent Caballe, Vice President Product & Services. One of the most important offerings by the OEM is the General Maintenance Agreement, which offers a comprehensive support agreement with airlines.

Under a GMA contract, ATR will handle the complete management of equipment, including the repair of line replaceable units (LRUs), the maintenance and availability of propellers, the advanced exchange pool of services, plus an inventory of spare parts on lease at the airline's main operating base.

The company uses a network of qualified MRO facilities, distributed around the world for customer proximity, although landing gear and propellers usually return to the OEMs. The company has warehouses in Paris, Miami and Singapore. He notes that it now uses reusable boxes for transfers between the warehouses.

He says a GMA, especially for a smaller operator, increases utilisation, hence revenue, while keeping down maintenance costs, adding that the growth in GMAs is greater than that of the market, which shows no sign of slowing. **M**



TOP TABLE

A new series in which we catch up with an industry leader and get their view of the industry. Our first guest is **Gareth Hall**, CEO of Ontic



PHOTO: ONTIC

Ontic is well positioned for the recovery, with a good balance of military and commercial products, and a diverse portfolio on newer and older aircraft

What do you see as Ontic's particular niche in the market?

Ontic supports Tier one OEMs through collaborative agreements, license and acquisition for the exclusive production their IP and the provision of customer support for the duration of the market need.

Ontic specialises in complex carveouts of entire aircraft systems and lines of business. Focused on sustaining these non-core, or legacy products, we are a long-term trusted partner to these OEMs and not a competitor.

Given that the company works with older technologies, are there components systems that you expect to disappear in the next five years?

Certainly, there is an eventual end to a product's lifecycle. However, Ontic specialises in sustaining engineering and supply chain expertise which enables us to ensure longevity of the products we are responsible for.

Will this be because particular aircraft will have retired, or will it be because items have been superseded, for example, cockpit upgrades?

A combination of both. Until a particular fleet of aircraft has completely retired, Ontic is able to help the operators by providing new spares or repairing the OEM products until they are ready to invest in upgrades.

What do you expect to see as the replacement technologies in that time frame?

This is a difficult question to answer given the wide range of product that we manufacture and the number of platforms we support.

Given the inevitably increased complexity that will be involved, is this a barrier to entry into the maintenance market?

The industry will invest and grow their expertise with supporting the new technology as it is introduced.

With few new aircraft under development in the near future, do you think OEMs will try to control the aftermarket?

We see those efforts; however Ontic remains focused on supporting OEM's through acquiring and licensing their non-core or legacy product lines.

How resilient do you think the airline industry is, and how will that affect Ontic?

Very resilient. The demand will return and surely the mix will be different than anyone thought prior to COVID-19. Ontic is well positioned with a good balance of military and commercial products, and a diverse portfolio on newer and

older aircraft. We are well positioned for the recovery and very well positioned to help OEMs with their turbulent year, and choices on which products they should focus on going forward.

How do you see the market recovering after this crisis, and how long do you think it will take?

Like all OEMs, we are looking at factors that will paint a better picture of what the recovery will look like. Right now, it changes from week to week. However, the picture will be clearer when we see all of the plans to reopen put in place. The exact length of time to recovery is difficult to predict right now. 



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