MRO BUSINESS TODAY

Sept 15Th, 2022

Pratt & Whitney completes Delivery of 1,000th F135 Production Engine

The 1000th F135 production engine was handed over to the U.S. Department of Defense for the 5th Generation F-35 Lightning II fighter.

Pratt & Whitney (P&W), a producer of aircraft engines widely used in both civil aviation and military aviation announced that the company has successfully delivered the 1,000th F135 production engine. The engine was handed over to the U.S. Department of Defense for the 5th Generation F-35 Lightning II fighter. This milestone delivery was marked by a celebration with Pratt & Whitney employees, company leaders, Chair of the House Appropriations Committee Rosa DeLauro (CT-03) as well as representatives from the F-35 Joint Program Office.

P&W has invested more than 500 million dollars since the first F135 production engine was delivered in 2009. The investment was mainly for capital, process improvements and cost reduction initiatives to support the production ramp and reduce the average unit cost of the F135 by more than 50%. In addition to Middletown,

F135 production sites include P&W's West Palm Beach, FL facility as well as a Final Assembly & Check-Out (FACO) facility operated by IHI in Japan.

"The 1,000th F135 delivery is a testament to the hard work of thousands of P&W employees and hundreds of suppliers who play a vital role in every engine that comes off the production line," said Jen Latka, vice president, F135 program, Pratt & Whitney. "This milestone underscores the maturity of the F135, which has been proven in the field as the safest, most capable fighter engine in the history of military aviation. As the only 5th Generation fighter engine in production today, the F135 provides the warfighter with a critical technological advantage. We are proud to support our men and women in uniform as a partner on the F-35,"she further added.

The F135 engine has evolved from the F119 engine powering the F-22 Raptor. The engine delivers a step change in capability over the previous generation of engines. This includes 40,000+ pounds of thrust; a substantial increase in a thermal management capacity. This enables the full spectrum of F-35 weapons and sensor capabilities. The precise and responsive integrated engine control system of the F135 production engine allows the pilot to focus squarely on the mission, and an unmatched low observable signature enables the F-35 to conduct operations in modern Anti-Access/ Area Denial (A2AD) environments.

The F135 has ample design margin to grow for the F-35 missions of the future. Pratt & Whitney's proposed block upgrade to the F135, known as the Enhanced Engine Package (EEP), delivers the fastest, most cost-efficient, lowest risk path to fully enabled Block 4 capability for all F-35 operators. This will save the U.S. Department of Defense $40 billion in lifecycle costs and build upon a combat-tested architecture with more than one million flight hours of dependable operation.

"Every one of those 1,000 engines represents safe, affordable, reliable 5th Generation propulsion capability in the hands of our customers," said Jill Albertelli, president, Pratt & Whitney Military Engines. "The F135 is the pinnacle of combat propulsion, ensuring our women and men in uniform can complete their missions in the most advanced threat environments and return home safely," she further added.

The F135 has demonstrated a best-in-class safety record and the current production engine configuration is achieving double the specification for Mean Flight Hours Between Engine Removals (MFHBR). The F135 sustainment network is also maturing, and engine availability has improved by approximately 75% over the end of 2021.

MTU Maintenance completes 4,000th MRO for CF6 engine

MTU Maintenance remains committed to the CF6-80C2, also providing MRO services for the military variant of the engine, the F138.

MTU Maintenance, a provider of customized solutions for aircraft engines, recently celebrated the delivery of its 4,000th CF6 engine after a shop visit. The CF6-80C2 engine was from customer Air Transport International, Inc. which is a wholly-owned subsidiary of Air Transport Services Group, Inc. The shop visit for the milestone CF6 engine was performed by MTU Maintenance's North American branch in Vancouver. MTU Maintenance has been supporting the CF6 for over four decades since it began providing services for the CF6-50 engine in 1982.

The CF6-80C2 version was introduced in MTU Maintenance's portfolio in 1989 and has accounted for more than half of shop visits performed since. While MTU stopped providing services for the CF6-50 engine in 2020, the company remains committed to the CF6-80C2 engine. MTU Maintenance also provides MRO services for the military variant of the engine, the F138.

MTU Maintenance's long-term experience and the ability to serve both commercial and military customers make them the reliable MRO provider for this engine, also in the long term. MTU Maintenance has already performed upwards of 40 shop visits for Air Transport International, since 2019.

"We are glad to celebrate this milestone with Air Transport International as the customer's growing fleet allows us to further ramp-up our CF6-80C2 volume in the years to come," says Michael Schreyögg, Chief Program Officer, MTU Aero Engines. "We are engine experts and dedicated to achieving maximum performance and optimal engine life for our customer's engines. We thank all our customers for their trust in us in during the last 40 years. Without them, we would not have been able to reach such a milestone," he further added.

MTU Maintenance is the largest independent MRO provider worldwide and has over 30 engine types in its portfolio and operates a global MRO network. MTU Maintenance is part of MTU Aero Engines, which has defined the overall sustainability goals for the group. MTU's aspirations as a sustainable industrial company include responsible and environmentally friendly procurement and a safe and attractive working environment.

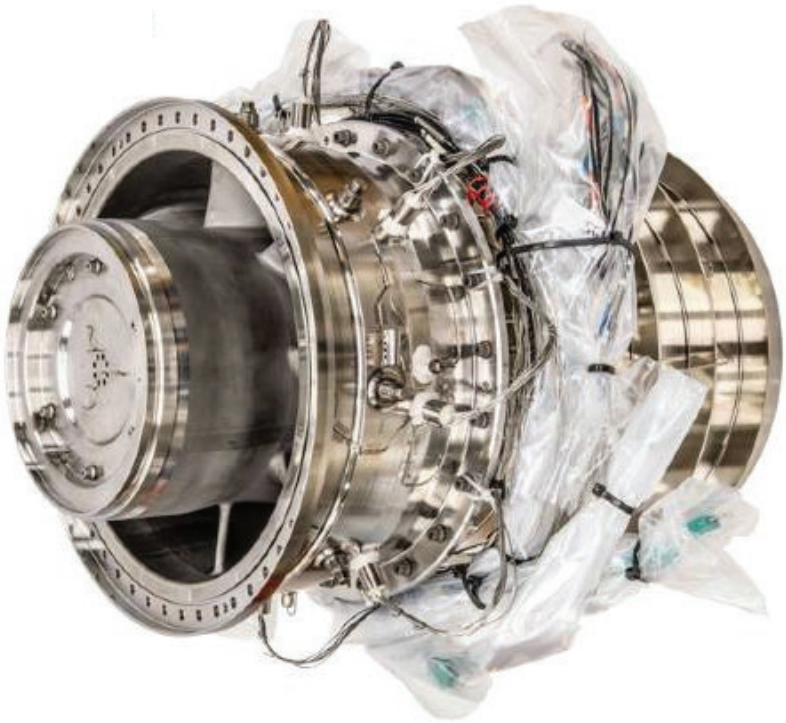
Overall, MTU Maintenance's activities cover six fields of action in the field of aviation i.e. product, manufacturing and maintenance, corporate governance, employees, society, and procurement practices. Alongside its initiatives to reduce the climate footprint of its sites, MTU is working on revolutionary propulsion concepts targeting climate-neutral aviation in 2050.

"MTU has done a tremendous job supporting our CF6 engine maintenance program," said Jim O'Grady, president of Air Transport International. "ATI provides the highest levels of service and expertise to our customers around the globe, so we demand the same commitment from our suppliers as well," he further said.

Air Transport International is a US-based airline with a fleet that includes over 40 CF6-equipped Boeing 767 aircraft. ATI has more than four decades and thousands of hours of cargo and combination passenger and cargo aircraft operations. Through this experience, the airline has developed the specialized equipment and valuable expertise to respond to emergency one-time charters as well as long-term scheduled programs.

GKN AEROSPACE supports the Clean Sky-2 programme with TE Module delivery to MTU

The Clean Sky-2 EMVAL demonstrator project includes the development and testing of a new MTU turbine module and a new GKN Aerospace turbine exhaust module.



GKN Aerospace will be presenting a paper on EMVAL and other demonstrator programmes on 8 September 2022 at the ICAS conference in Stockholm.

GKN Aerospace, a multinational developer of automotive and aerospace components, announced that the company has successfully designed, developed and delivered a new Turbine Exhaust Module to MTU. The module was developed by GKN Aerospace engineers at the company's facility in Trollhättan Sweden. The Turbine Exhaust Module was delivered to MTU in Germany as part of the EU-funded Clean Sky-2 EMVAL demonstrator programme. The ground testing of the full-scale Engine demonstrator will be conducted in the later part of 2022at MTU. The demonstration will be a key milestone in the validation of the concept.

The Engine Material VALidation engine (EMVAL) demonstrator project includes the development and testing of a new MTU turbine module and a new GKN Aerospace turbine exhaust module. The test will be done using an existing turbo shaft engine modified as a test vehicle. The Turbine Exhaust Module is paramount for heat dissipation and performance of an aero-engine and due for this reason is a key component in improving efficiency.

Lars Ellbrant, Technology Programme Manager for the exhaust module development at GKN Aerospace said, "This type of demonstrator project is absolutely vital for GKN Aerospace in order to validate our new technologies at high TRL levels (TRL 5-6) using a full engine test together with international partners."

GKN Aerospace will be presenting a paper on EMVAL and other demonstrator programmes on 8 September 2022 at the ICAS conference in Stockholm. The GKN Aerospace module includes a novel lightweight turbine exhaust case (TEC) design with separated thermal and mechanical functionality. It has been produced with extensive use of additive manufacturing (AM). The TEC consists of an inner load-carrying structure and aerodynamically shaped vanes (or heat shielding fairings). This concept can withstand higher temperatures than current TEC's, but it also saves weight as the axial length can be reduced.

The Clean Sky-2 EMVAL programme

- Innovative lightweight design and manufacturing of Turbine Exhaust Module under Clean Sky-2 EMVAL programme will contribute to lower carbon emissions.
- Module is 20% lighter and can withstand 150°C higher temperatures compared to existing technology, contributing to increased engine efficiency and lower fuel burn.
- The Clean Sky-2 EMVAL programme aims to validate new materials and designs for introduction in the next-generation geared turbofan engines.
- Development confirms GKN Aerospace's position at the forefront of the next generation of sustainable propulsion technology.

The engine demonstrations made within the European Clean Sky 2 programme will validate new solutions for the next generation of ultra-efficient aircraft engines. GKN Aerospace is a core partner in the Clean Sky-2 programmes. The aviation industry has unanimously agreed to become climate neutral by 2050 and reducing fuel consumption is fundamental to reaching this goal.

C&L Aviation Group boosts PMA part manufacturing for ATR operators

C&L Aerospace has partnered with a manufacturer to become the exclusive distributor on a PMA part alternative for a Rear Tail Cone Lens assembly for the ATR aircraft.

C&L Aerospace, a C&L Aviation Group company, has enhanced support for ATR operators with an increase in the manufacturing of Parts Manufacturer Approval (PMA) parts for aircraft. Most recently C&L formed a partnership with a manufacturer to become the exclusive distributor of a PMA part alternative for a Rear Tail Cone Lens assembly for the ATR aircraft. C&L Aerospace has been providing more parts, support programs, and offerings for ATR operators for several years.

Parts Manufacturer Approval (PMA) is an approval granted by the Federal Aviation Administration (FAA) to the manufacturer company of aircraft parts. The Parts Manufacturer Approval (PMA) holding manufacturers are permitted to make replacement parts for aircraft, even though they may not have been the original manufacturer of the aircraft. Parts produced under an FAA PMA have approved parts.

"C&L is not only focused on supplying new, repaired, and overhauled material to our ATR customers, but we're always listening to and working on products that benefit our customers," said Warrick Hood, Senior Vice President, C&L Aerospace. "C&L customers identified the ATR Rear Tail Cone Lens as a part with supply, quality, and economic concerns and we developed a solution to address all these concerns," he further added.

The Rear Tail Cone Lens and Static Port Covers are available and located in C&L warehouses located in The United States, Europe, and Australia. The units are the first PMA parts for the aircraft that C&L exclusively distributes with several more in the works. PMA part number S5387300500202-CL is compatible with OEM part numbers S5387300500202, S5387300500200, S5387300500201 and currently in stock and available for flat-rate exchange.

The company's ATR support program includes PMA development, rotables, leading edges, propeller support, engine support, consignment, and pool agreements. The support program combined with previous multi-million-dollar parts purchases and eight ATR teardowns completed in the past thirty-six months provide a significant inventory to support operators.

Lufthansa Technik signs TCS contract for Mexican carrier mas Airbus A330F fleet

The new Total Component Support contract governs supply for up to eight Airbus A330F aircraft over a period of eight years.

Lufthansa Technik, a provider of aircraft maintenance, repair, overhaul and modification services for civil aircraft, announced to have signed a comprehensive Total Component Support (TCS) with Mexican carrier mas, formerly known as MasAir. The contract will cover the repair and overhaul of components for mas´s Airbus A330F fleet. The new contract governs supply for up to eight Airbus A330F aircraft over the period of the next eight years. This is the second contract between the two companies as Lufthansa Technik already supports the Boeing 767F fleet with its Total Component Support (TCS) product.

With the A330F Total Component Support TCS agreement, Mexican carrier mas benefits from an individual supply concept that enables short and rapid transport paths. Component support of the Mexican carrier mas fleet will be ensured through an on-site stock to be established in Mexico City, Mexico. The A330F fleet will be supported by Lufthansa Technik's component pools located in North America and Europe.

Luis Sierra, Chief Executive Officer of mas, said, "Our new A330 logistic network is a global network with destinations in Asia, Europe and America. To support our network, we need a global player in technical aircraft services whose experience and reliability we highly value. Lufthansa Technik already proves day by day to deliver first class services, which is required for our operation. This is especially important now that we are on an ambitious fleet expansion plan."

Lufthansa Technik AG provides maintenance, repair, and overhaul (MRO) services for aircraft, engines and components. Certified internationally as a maintenance, production and design company, Lufthansa Technik AG has a workforce of more than 20,000 employees. Lufthansa Technik's portfolio covers the entire range of services for commercial and VIP/special mission aircraft, engines, components and landing gear in the areas of digital fleet support, maintenance, repair, overhaul, modification, completion and conversion as well as the manufacture of innovative cabin products. It is a subsidiary of the Lufthansa Group.

"We are very pleased to continue our service for mas's A330F fleet. We are proud to be part of mas's journey because the Mexican market remains highly competitive," said Soeren Stark, Chief Executive Officer of Lufthansa Technik.

Lufthansa Technik is headquartered at Hamburg Airport. Other important German sites are at Frankfurt Airport and Munich Airport. There are overseas sites located at Aguadilla Airport in Puerto Rico, in Manila, Philippines, or in Shenzhen, China. In Europe, there are major base maintenance facilities in Malta, in Budapest, Hungary as well as in Sofia, Bulgaria.

Image Courtesy:Rolandberger.com

MAPPING MRO RECOVERY

Introduction - impact of covid 19 on the mro sector

The five-year period between 2016 and 2020 (leading up to the tumultuous pandemic years brought about by the novel Coronavirus), exhibited a 0.8% CAGR for the aviation MRO sector. Effective early 2020, almost like a reflex action, major airlines went into large-scale grounding of their fleet with travel coming to a grinding halt. Countries across continents went into panic mode to contain the spread of this virulent Covid 19. Air transport was amongst the first to fall victim to this scourge.

Future Market Insights (FMI) in a recent study found that the air transport MRO market registered year-over-year growth of 5.0% between 2020 and 2021 - a result of travel restrictions worldwide.

This sudden contraction in the air travel market spelled gloom not only for airline companies, but the entire aerospace industry. After all, the key driver for airlines to spend on MRO services is flown capacity ASK (available seat kilometres, for passenger aircraft and available ton kilometres, (ATK) for freighters. The sudden resultant reduction in ASKs, led to an anticipated short-term drop in the aftermarket in 2020.

Rapid cost-cutting measures went into play for this capital-intensive aviation sector. Grounded airline fleets led to cutting back of aircraft orders from airlines across the globe. With nearly 80% of regional fleets pulled out of service, at the height of the outbreak between February and April 2020, recovery to return to the new normal remained slow.

With the air travel industry continuing to see a southward slide in sales, the challenge of revenue loss loomed large for MROs, with airlines carrying out in-house maintenance and repairs in a bid to reduce expenditure or cash outflows.

However, with the majority of aircraft fleets parked, created a huge demand for maintenance and repair services for those assets. After all, the airlines needed to keep their aircraft fleets 'service ready' for operations, the soonest COVID protocols permitted. Thus, airline MROs have had their work cut out.

A Roland Berger prediction (see image below scenario 3b) expects moderate growth of 3.6% CAGR for the MRO sector, in the 'new normal'. This would, of course, be the outcome of vaccination drives executed on a war footing, cautious lifting of travel restrictions, and resumption of air travel mainly in Europe and Asia where economic activity has seen a better pick up. During this period, larger markets like those of the

USA, India and Brazil were seen to be grappling with the effects of the covid stranglehold, and growth prospects will take longer to realize.

with rising air travel and cargo transportation, and this alone can justify investing in these regional hubs, for MROs.

extensions by airlines during the pandemic years.

This encouraging regional growth story, is leading many reputed MRO players to set up service hubs to take advantage of market opportunities and for growing their businesses. Some fine examples are:

- In 2020 Pratt & Whitney GTF the global engine maintenance arm of the aircraft engine manufacturer network by setting up two new MRO service providers in China.
- Aircraft Maintenance and Engineering Corporation (AMECO) (a JV between Air China Limited and Lufthansa Airlines) and MTU Maintenance Zhuhai Co. Ltd (a JV between MTU Aero Engines and China Southern Airline Company Limited) established a new hub for GTF's MRO network for maintenance and servicing PW1100G engines for the Airbus A320neo aircraft family.

With low-cost labour availability in markets such as Vietnam and Thailand, the opening up of MRO facilities and growing their businesses have become an attractive proposition for industry players. Such developments will boost the MRO business further in this region.

Updated scenarios – now with variation in retirement

	Baseline	Scenario 1 Fast recovery	Scenario 2 Delayed cure	Scenario 3a Recession	Scenario 3b Recession
Shut down period	–	2 months	3 months	6 months	6 months
"New normal" reached by	–	Winter 2020	Summer 2021	Summer 2022	Summer 2022
Level of "new normal"	100%	100%	90%	80%	80%
CAGR after "new normal"	4.6%	4.6%	4.1%	3.6%	3.6%
Recovery to 2019 RPKs	–	2020	2022	2024	2024
Fleet retirements	–	Pre-crisis retirement plans	Accelerated retirement of older aircraft	Pre-crisis retirement of Widebody aircraft	Accelerated retirement of Widebody aircraft
Likelihood of occurrence	–	Out of reach by now	Unrealistic	Likely	Very likely

Image Courtesy:Roland Berger

Ascertaining future travel demand for airlines remained nebulous due to lack of data, making it difficult to accurately plan capacity. There is no one-size-fits-all solution for the sector and a variety of strategies are being applied to get back into normal service.

Given the focus on capacity planning, the currently grounded widebody aircraft, such as Airbus A380s and Boeing 747s, will not return to service. Some of these that have not yet reached the end-of-life- cycle, are likely to be replaced by newer versions of widebodies such as Airbus A350s, route-specific Airbus A 321XLR, and the Boeing 787s. This will no doubt come as a boon for MROs.

However, aircraft in the second half of their life, (those that have reached 10 plus years), account for more than half of assets owned by airlines, and spend on MRO services will naturally be more towards heavy maintenance checks. If these older planes are replaced by new aircraft, this MRO requirement would drastically reduce until the newer aircraft go in for their heavy maintenance schedules.

Recovery opportunities through service hubs

According to forecasts, the pick of sales of air transport MROs is expected to be realized through an increasing number of MRO 'service hubs' spread internationally. All this is made possible

Commercial Aircraft Maintenance, Repair, and Overhaul (MRO) Market - Growth Rate by Region (2022 - 2027)

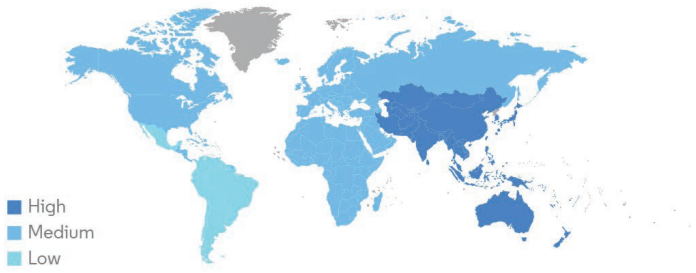


Image Courtesy : Mordor Intelligence

According to the Mordor Intelligence infographic, MRO spending in the Asia Pacific region by airlines will be higher and the industry is expected to bounce back to pre-pandemic levels the fastest. Late 2022 as forecasted.

Growth of service hubs

Asia-Pacific Region

The Asia-Pacific region is tipped to witness the fastest growth over the next decade, supported by strong demand for narrow-body aircraft in the region. With 1/3 of the world's commercial aircraft concentrated in this region and growing, the MRO sector will get much fillip for servicing the newer and existing fleets out here.

Industry experts further foresee growing business for MRO services, given the increase in average fleet age of aircraft in the APAC region, on account of lease

Latin America and Africa

Elsewhere, in comparison, the recovery of the Latin American and African markets remains slow with the effects of the coronavirus pandemic lasting longer in those regions. Projections for the 2022 – 2027 period show 2023 as the year of returning back to 2019 levels of air transportation and economic movement.

Europe and North America

Another factor impacting the travel

sector and in turn MRO services support, is the adoption of hybrid work culture and remote working. Expected is a resultant drop in potential business travel across Europe and North America and recovery back to 2019 levels is expected to be much slower. The European travel market is expected to spring back earlier in 2024, as per forecast, and so will demand pick up for MRO services, whereas in North American, getting back to 2019 levels for both air travel and resultant MRO services is pegged for late as 2025.

Observations made by Roland Berger say that "the industry will adjust to the 'new normal'. We anticipate this will be a balance between recovered demand for air travel and new requirements around physical distancing, sustainability and de-globalization."

The period is expected to see an increase in focus on aircraft maintenance, bettering safe and comfortable customer experience by providing the latest onboard services, and the continuous demand for cost-effective solutions. All of this is expected to spur growth in the MRO sector. The modifications segment is expected to gain importance through the crisis. Installing new health and disinfection measures as mandated by health authorities during the pandemic, called for cabin modifications. These are HVAC upgrades, antibacterial surfaces, and touchless cabin items, and this will add to the earnings somewhat for MROs in the modification activity. Cash-strapped airline companies may not be able to pay for these upcoming changes immediately, impacting MRO earnings in the short term.

Airlines may be forced to divest their captive MRO activities to free up cash and manage their survival. Some strong in-house MRO shops could benefit by gaining higher shares of third-party businesses.

In the short term, MRO companies are resorting to the usual cost-cutting measures, such as cross-utilization of a reskilled workforce, cash conservation by spend curtailments, and postponement of investments. Such measures have been undertaken across the sector by nearly all players, with governments doing their bit with financial support.

However, any market recovery plan will need to budget requirements for the mid-to-long-term impact of the downturn. All seen during the period will be shuttering of several smaller and more vulnerable MRO units, takeovers and industry consolidation.

Consolidations and path to recovery

Another Roland Berger research finding said, 'recession as the most likely outcome' and predicts 'consolidation as the solution' for the pandemic hit aviation MRO sector.

The recovery phase will see MRO companies embrace consolidations more and more, going forward.

Some notable developments in that area have been that of United Technologies, Rockwell Collins and Raytheon all merging to form a formidable aftermarket entity - Raytheon Technologies.

Then again, Zodiac Aerospace's absorption into Safran is a reflection of strengthening positions through integration, as also capturing value-chain coverage.

Investment firms too have been active in the MRO growth story. For example, The Carlyle Group's strategy of 'Buy and Build' brings smaller companies that offer complementary specialisations, under their powerful umbrella brand StandardAero.

Aircraft OEMs on the other hand have focussed on acquiring specific businesses like aftermarket parts sales.

Digital solutions to remain relevant and cost effective

With maintenance costs outstripping fuel costs during the period, airlines have been quick to adopt digital applications for cost savings and efficiency. Digital solutions allow airlines to monitor physical assets like engines and cockpit parts, in real-time. Simultaneously, MRO players are getting innovative to remain relevant in the market and are foraying into research and development in areas of technological advancements. The idea is to offer cost-effective solutions to their customers, and modernise service standards, in order to get a better share of the market.

Cloud services, and mobile solutions are some of the areas MROs are developing 'software as a service' (SaaS) in itself. For instance, mobile solutions are of great advantage, allowing aircraft management remotely. Importantly, technological innovations introduced in the system reduce overhead costs of hardware owning and maintaining.

Concepts such as predictive maintenance remain novel in the MRO industry, and the challenge here has been both adapting the technology and adequate manpower skilling. Working with for example 'digital twins' that predictive maintenance allows, are rapidly being adopted by established MRO firms at a fast pace, for remaining relevant.

However, there are only a few MROs that can and are willing to invest in such advanced technologies, and raise an army of skilled personnel. While there are others with limitations and are

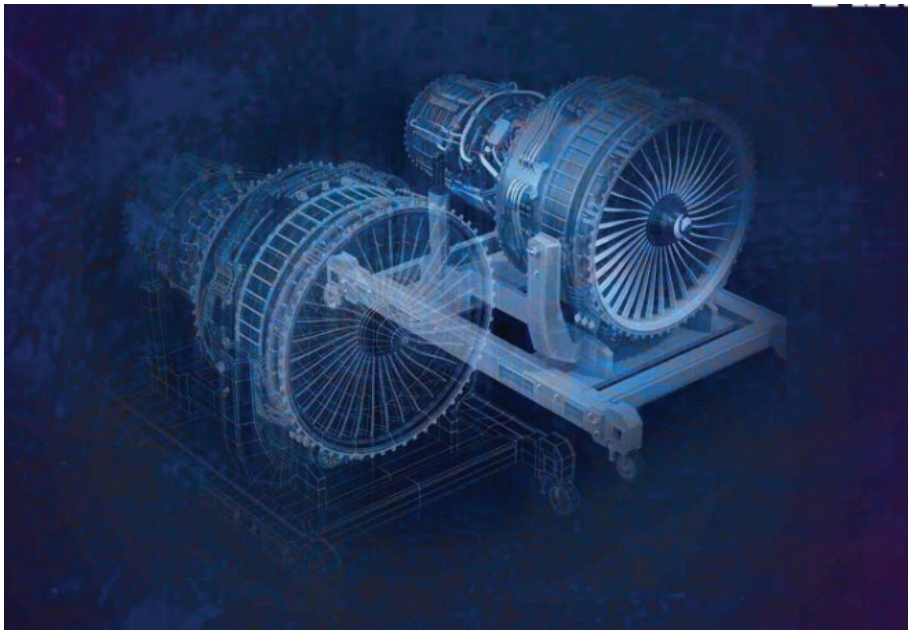


Image Courtesy : analyticsindiamag.com– AI enabled digital twins

unable to harness the true potential of these latest concepts. The market is then riddled with varying repair and maintenance service standards, the demand from OEMs for the superior quality of service, given new equipment and components - all of this challenge the MRO process with complexities, and that has dampened the pace of steady growth, in the new normal. Key players in the segment reported a downturn in revenues of 50-70% in Q2 2020, for example.

Impact effects on individual sub-segments

Commercial Aircraft Maintenance, Repair, and Overhaul (MRO) Market: Revenue (%), by MRO Type, Global, 2021

Source: Mordor Intelligence

All aspects of the MRO business (engine, airframe, line and component maintenance) have been affected by the pandemic with varied intensity, depending on the nature of the business or sub-segment.

1)Out of these the engine maintenance segment is poised to dominate the market during the recovery. The MRO activities include both field and depot maintenance. However, OEMs have an advantage here as they dominate nearly half the engine MRO market, while the balance is owned by independent MROs and airline maintenance and overhaul shops.

Business generation for independent MROs is realized through tie-ups such as Saudi Arabia's low-cost airline flynas, finalizing a multi-year Rate Per Flight Hour (RPFH) agreement (December 2021), with CFM International for the LEAP-1A engines, across the carriers 80 Airbus A320neo aircraft. By means of similar RPFH agreements, CFM is able to offer aftermarket support to their clients that drive revenue and growth for the engine MRO segment, during recovery.

However, the short-term earnings from engine maintenance will be conservative, with airlines making optimal use of useful flight cycles and 'green time' engines from grounded aircraft. Airlines will part out engines of aircraft that are being retired and will have a lesser need of spare parts. Plus, in the long-term, newer fleet orders mean less time spent in engine MRO workshops.

2) With aircraft closer to comprehensive checks being grounded, and several of the widebodies not returning to service airframe maintenance will be deeply impacted. This is true especially with newer aircraft replacing the older generation aircraft in some fleets. Again, airlines will make the best use of engine 'useful life' and push back heavy maintenance checks. Splitting C and D checks into smaller groups allows airlines to manage capacity better and there is some modest earning opportunity for MROs toward airframe maintenance during the downturn.

3) Line maintenance is directly proportional to the number of flight cycles, correlating to ASKs. The demand for line maintenance drops with drop-in ASKs and the downturn has seen huge amounts of loss for MROs' line maintenance activity. However, the recovery of this segment is linked to picking up air transportation by the same logic.

4)Component maintenance has been a mixed bag MRO of life-limited components linked to flight cycles, hours or other mandatory replacement limits, while other components can be maintained based on their actual condition. Airlines are likely to utilize useful components from grounded aircraft not returning to service or those retiring earlier than planned. Thus, the value of their components will command a higher price if made available in the spare market.

Major players in the mro domain

Amid soaring competition, Hong Kong Aircraft Engineering Company Limited, Singapore Technologies Engineering Ltd, Air France–KLM, AAR Corp., and Lufthansa Technik AG remain the top 5 players, holding 11% of the total market share.

Conclusion

In conclusion, the aerospace industry has experienced the biggest downturn thus far, and getting back to normal has been a herculean task, dependent largely on travel and economic activity pick-up. The pain points for the MRO sector have been acute. However, few business opportunities have presented themselves such as the consolidation game and extension of footprint, digitization that results in significant cost savings and increased efficiency, and a larger presence through the creation of service hubs. Each MRO entity will need to weigh and balance out what the best fit would be, for a way out of this downturn.

In the near future, the aviation MRO sector will see a smaller number of players which may come from consolidation. It would bode well for MROs to invest in innovation, and advanced technology, and be able to offer best-in-class services to customers in order to retain and gain business.

With the industry stabilizing at a lower level, the positive outcomes would be of sustainability, innovation (digitally mainly) and an ecological-oriented approach.

Reference Credit: Mordor Intelligence
Roland Berger Research
FMI- Future Market Insights

GE Aviation inaugurates new Asia-Pacific MRO facility in Austral

The GE Aviation MRO services facility is strategically positioned to support a higher number of customers with an aim to expand the company's presence across the Asia-Pacific region.

GE Aviation, an aircraft engine supplier that offers engine services for the majority of commercial aircraft, announced the opening of a new state-of-the-art facility in Australia. The new facility will provide maintenance, repair and overhaul services for customers and aircraft operators across the Asia-Pacific region. The new Asia-Pacific Service Centre was built at a budget of $8 million at the Brisbane Airport.

Sam Maresh, Australia Country Leader, GE Aviation said, "A key part of GE Aviation's global customer services network, this truly world-class facility offers cutting-edge technology and highly skilled technicians at a one-stop shop for aviation customers from across the Asia-Pacific region. We are delighted to mark a new chapter in our Australian operations and our near two-decade relationship with Brisbane Airport with the opening of a leading aviation servicing facility that creates fresh opportunities for GE Aviation."

The Maintenance, Repair and Overhaul (MRO) services facility is strategically positioned by GE Aviation to support a higher number of customers with an aim to expand the company's presence across the Asia-Pacific region. The new facility was officially inaugurated by Queensland Assistant Minister to the Premier Bart Mellish MP in a ceremony held at Brisbane Airport.

Annastacia Palaszczuk, Queensland Premier said "I welcome the expansion of GE Aviation's new facility in Brisbane, building on aviation services based at Brisbane Airport servicing the Asia-Pacific region. GE Aviation's increased investment is an investment in Queensland's future and is a signal to young people in particular that good jobs are available in a range of industries."

The new modern facility will be the largest GE Aviation Systems service centre in the Asia-Pacific region. The facility supports avionics, flight management, electrical power and DOWTY propeller systems on various aircraft including the Boeing 737 and 787, Q400 and F-50 regional aircraft, and the Royal Australian Air Force's fleet of C-130J Super Hercules and C-27J Spartan Military Transport Aircraft.

Gert-Jan de Graaff, CEO, Brisbane Airport said "GE Aviation's partnership with Brisbane Airport continues to go from strength to strength, and we really look forward to building our relationship. This hi-tech workshop is important for the future of the airport, and we welcome the commitment from GE Aviation as a sign of confidence in the growth outlook."

The new technologically advanced Maintenance, Repair and Overhaul (MRO) facility will provide employment to more than 80 people. According to GE Aviation, The facility is set to boost the local economy, while also contributing to the growth of Brisbane Airport.

Rolls-Royce to open new facility in France for Pearl 10X engine production support

The new facility will play an important role in the production support of the Rolls-Royce Pearl 10X engine, which exclusively powers Dassault's new Falcon 10X flagship aircraft.

Rolls-Royce, the world's second-largest aircraft engines manufacturer, recently finalized the decision to construct a new facility in Le Haillan near Bordeaux, France. The new facility will play a vital role in the production support of the Rolls-Royce Pearl 10X engine. The new 2,000 sqm production support center, will house offices, a workshop and a warehouse for the engine. The construction of this facility will begin in the latter part of 2022 and will be completed in the first half of 2023. Dassault's brand-new Falcon 10X flagship aircraft is exclusively powered by the Rolls-Royce Pearl 10X engine.

Dr Philipp Zeller, Senior Vice President for Dassault, Rolls-Royce, said, "While the Pearl 10X engine development programme for the Dassault Falcon 10X is making good progress, we are already working in parallel on establishing the infrastructure to support Dassault's flight test activities and its production line. This new facility will further strengthen our partnership with Dassault and it will ensure the delivery of the class-leading customer support already associate with the name Rolls Royce."

The new facility will be a part of the global Rolls-Royce support network. The engine support center is complemented by Rolls-Royce's powerful customer service infrastructure of more than 75 Authorized Service Centers, by On-Wing Services specialists in the USA, Europe, Middle East and Asia as well as a number of spare parts, lease engines and storage locations, all placed strategically around the world.

Rolls-Royce and Air China form Joint Venture to open MRO facility in Beijing

The new facility, Beijing Aero Engine Services Company Limited (BAESL), will provide MRO support on the Rolls-Royce Trent 700, Trent XWB-84 and Trent 1000 aero engines.

Rolls-Royce, the world's second-largest maker of aircraft engines has announced that the company is entering into a new 50/50 Joint Venture (JV) with Air China, the flag carrier of the People's Republic of China. The Joint Venture between the two companies will create a new maintenance, repair and overhaul (MRO) facility in Beijing, China. The new Beijing facility, Beijing Aero Engine Services Company Limited (BAESL), will provide MRO support on the Rolls-Royce Trent 700, Trent XWB-84 and Trent 1000 aero engines. Air China currently flies all three engine types in its fleet.

The facility is expected to achieve its full functional capacity by the mid-2030s. The Beijing Aero Engine Services Company Limited will be able to support up to 250 shop visits per year. The facility will offer MRO services to Air China as well as our other airline customers based in Greater China and beyond. Currently, Rolls-Royce powers 60% of China's widebody fleet, powering more than 550 aircraft in service or on order. The Rolls-Royce Trent 700 engines also power 90% of the country's Airbus A330 fleet and the Greater China fleet represents 20% of all Trent engines flying currently.

Chris Cholerton, President – Civil Aerospace, Rolls-Royce, said, "The announcement of this JV is an important milestone for Rolls-Royce in China, where we have been powering the nation's airlines for more than 50 years. Air China is a strategic partner for us, having successfully grown together over many years, and I am delighted to now expand our relationship with this exciting partnership in MRO and look forward to continued growth of our collaboration."

This Joint Venture is an important part of Rolls-Royce's strategy for China, in terms of deepening our relationship with Air China, giving customers the best level of service, improving the cost-competitiveness of the company's business and generating incremental MRO capacity as shop visits grow. It aligns in-region growth with in-region capacity providing customer proximity, which supports Rolls-Royce's sustainability goals by reducing overseas transportation of engines for MRO activity.

Ma Chongxian, President of Air China, said "With safe operation as top priority, Air China has long been committed to developing aircraft maintenance capabilities and ensuring the reliability of the fleet, meanwhile striving to promote the industrialisation of aircraft maintenance. In the future, Air China and Rolls-Royce will continue to deepen our profound partnership and start a new journey of cooperation in the field of high thrust engine maintenance. We look forward to building the Joint Venture into a world-class aero engine MRO company and increasing the volume of China's civil aero engine MRO industry."

The new facility will also support the continued expansion of Rolls-Royce's capable, competitive and flexible global Care Network. It is part of the company's strategy to expand the MRO network in a cost-effective way in order to support the growing fleet, as outlined at the Rolls-Royce Investor Day in May 2022.

The Beijing Aero Engine Services Company Limited will be able to support up to 250 shop visits per year.

Collins Aerospace begins expansion at Jamestown Cargo Systems facility

The Jamestown expansion includes space for new state-of-the-art chemical processing and paint lines designed to maximize operational efficiency, and improve site ergonomics.

Collins Aerospace, a supplier of aerospace and defense products recently broke ground on an expansion of the company's Cargo Systems facility in Jamestown, North Dakota U.S. The new expansion to the facility will add a space of 20,000 square feet. It will be the first phase of a plan to modernize the operations of Collins Aerospace at the facility. A total of four phases for expansion are planned. The first phase of the Jamestown facility expansion is expected to be completed by May 2023, with the entire project to be completed by 2027.

The current 200,000 square-foot facility at Jamestown is a supplier of powered cargo systems for commercial widebody aircraft and an innovative solutions provider for military aircraft. This also includes the Collins Cargo On/Off Loading System (COOLS) for the Boeing CH-47 Chinook helicopter.

"As our cargo systems business has grown in both the commercial and military segments, so too have the needs of our Jamestown facility," said Brad Haselhorst, vice president and general manager of Military, Safety & Cargo Systems for Collins Aerospace. "The current and future success of our cargo business is largely dependent on the critical work performed from our Jamestown site. This re-investment helps ensure Collins is best equipped to deliver our customers the advanced cargo systems that enable the swift and efficient movement of freight across the globe," he further added.

The expansion of the Jamestown facility will include space for new state-of-the-art chemical processing and paint lines. These lines are designed to maximize operational efficiency, improve site ergonomics and provide customers with expedited delivery schedules. The chemical processing line will further grow to include 8-10 additional tanks, expanding the internal parts processing capabilities of the facility.

"Our facility expansion is not only a gamechanger in terms of maximizing our site's operational effectiveness, but it's also a re-investment in this great community we've called home for more than 50 years," said Wayne Jones, general manager of Cargo Systems for Collins Aerospace. "The decades of support and collaboration from the city of Jamestown, the state of North Dakota and the 450 dedicated people who make up our incredibly talented employee base have been the keys to our past success and will continue to pave the way towards our future progress," he further added.

Collins Aerospace is a Raytheon Technologies subsidiary. The company stated that the decision for the expansion is a result of much-needed manufacturing space and to best position the facility to meet both current and increasing processing needs.

Expert Opinion: MRO Growth Strategies for Turbulent Times

The last few years have been the most challenging in aviation's history as the industry endured an unprecedented travel demand shock. But you know what they say, "pressure makes diamonds."

During these times, it's common for people and organizations to narrow their focus to what is most important and what they do best. "What I see is airlines going back to their core -- their core markets and their core segments," said Iván Vallejo González, Director of Strategy and Supply Chain at Iberia.

Therefore, these challenges have provided the catalyst for much-needed change. Although we're still in the midst of a recovery, the industry is trending in the right direction.

Iván Vallejo González, Iberia

Patrick Coval, United Airlines

The Key Issues of Today

Before we look ahead, let's take a step back and learn from where we came from while analyzing where we are now.

Right now, not just aviation but the world as a whole is faced with rising inflation and an impending recession, which will force individuals and companies alike to control costs and accelerate efficiency. This will undoubtedly spill over to airline MRO functions, which have already been massively affected by the demand shock from the last few years.

"The world is worried about how year-on-year pricing is increasing," said Iván Vallejo González, Director of Strategy and Supply Chain at Iberia. "In aviation, we've seen this for the last couple of decades. And basically, every ten years costs double up, whilst revenues for airlines go down 2-3%."

When supply chain transparency is discussed, most of the time, the topic is supply. The other half of the equation is "demand", and suppliers need to be aware of this. Knowing changes in demand as soon as possible allows suppliers to take smarter actions. Slow down production, not stop it altogether.

Beyond visibility, another significant challenge is long lead times. A significant contributor to the long lead times is the amount of manual activities and redundancies in the order management and delivery processes.

"When a part takes 15 minutes to be received into inventory instead of 2 minutes, it's a problem," said Coval. "You might say that 13 minutes is not going to cause problems, but when you realize that this 15-minute part is behind 50 other 15-minute parts, now you're pushing 12 hours to receive the last part."

Much of this time goes to manual, non-value-added work, and beyond inefficiencies, manual work also leads to errors, which only compounds problems. Errors contribute so much to delays and excess demand in the supply chain that are avoiding them is reason enough to digitize every order and shipment.

MRO Market Drivers

As for looking into market developments, there are several key indicators that we can look towards. At the crux of all of it will be technological development and adoption, which will enable us to receive more and better information quicker, ultimately leading to better decisions and outputs.

Information is relatively cheap compared to expensive machines and inventories, and the lead time to move to better information is relatively short and impactful.

As we have seen in other industries, speed and the ability to provide services and goods promptly — in this case, aerospace components — quickly distinguish leaders from followers. Good information is the key to responding timely and accurately.

"The sooner you know something the more prepared you are for what's to come. As always, MRO vendors are under pressure from both customers and suppliers," said Coval. "Most of this bottleneck is due to cost and price, but at the root of it is information, specifically the reliability of that information."

The MRO industry needs to be very careful about the kind of information it receives in order to provide the repair and overhaul services that airlines need, even with detailed parts, services, and even complex sub-assemblies. In addition to the part pedigree, the MRO needs to know the status of the parts already ordered and the availability of parts that may be needed for repairs appearing in the workshop.

"This traditionally requires heavy investment capital, which creates a lot of parts sitting on shelves," said Gonzàlez. "We've seen technology change this in other industries by creating a share of assets. Airbnb is a great example as being the largest hospitality provider in the world but owning zero assets. Uber is another example. Why can't this happen in MRO?"

Additionally, OEMs and third-party


Erkki Brakmann, CEO, SkySelect

PMAs are one of the most exciting things that have happened in aerospace and many industries over the last three decades, including 3D printing and more specifically, additive manufacturing.

Additive Manufacturing, as it means, takes the opposite route of historic casting and forging, milling, and machining, basically creating new parts from raw metal powder. A few expensive parts are the best environment for laminated molding.

A supplier who has used this to move to a just-in-time or Kanban approach, making available a wide variety of inventories with very short lead times, will be the supplier to work with in the future, creating the most reliable supply chain. And, of course, fast and reliable communication with them is an advantage for MROs, so going back to information!

What makes all of this work is digitization. Providing customers with the digital information they need is easier than printing all the documents provided in the past.

"Investing in technology or information is way cheaper than buying parts or material handling equipment and other physical assets," said Coval.

The need is even more explicit due to the current labor market as airlines are facing a serious resource crunch. We have seen experienced airline professionals permanently move on to new opportunities, airlines have to rely on technology (i.e., machines) to eliminate the low-value tasks and become more agile and scalable, so they empower the people to work on more strategic tasks.

The MRO industry digitalization progress is visible and unstoppable because airlines have realized that by using smart technologies, they can improve their bottom line.

86% of airlines are investing in aircraft maintenance IT services, which is especially impactful for aircraft component/parts management because it has traditionally been a labor-intensive and manual process.

Thanks to digitization efforts and rising technologies, the fleet maintenance and parts purchasing process can be tangibly improved. This shift allows organizations to lower costs, keep operations lean, and their movements agile. The key is to build a digital ecosystem so all IT technology resources can function as a unit.

Those that don't adapt and leverage digital technology will have a hard time competing in this highly competitive market to stay afloat.

How to Leverage Technology for Business Growth

It's clear that the way forward is through technology. However, adopting and configuring technology and processes around it can present challenges of their own. However, as technology advances, it's becoming simpler than ever before to implement it.

"Historically, it's been a major lift for airlines to incorporate new technologies or change their systems. There's countless horror stories about airlines investing millions of dollars into tech that never is properly set up or put into use at all." said Erkki Brakmann, CEO at SkySelect. "Fortunately, there are a number of solutions, including SkySelect, that can be installed in mere hours and without ripping out any existing systems."

As for what approach to take and how to leverage technology, there are numerous approaches. Coval offers up one such solution.

"Perhaps the easiest approach to leveraging technology in the MRO supply chain comes from the use of Business Process Automation (BPA)," said Coval. "At an airline, I was at a few years ago, we automated the activity to evaluate whether we needed to repair a rotable when it was removed. The bottom line for us was that after automating this evaluation process, we saved about $4 million dollars the first year."

"There's a lot of things that can be done, even on an individual basis. For example, we've launched our own machine learning (ML) team and our own artificial intelligence (AI) team to predict demand based on production plans," said González. "This will help us forecast a lot of repairs and maintenance."

These are just a few of many examples of where technology can improve the supply chain and overall MRO efforts of airlines. While the exact strategy and tactics can be debated, one thing is certain — technology is the way forward!

"I really honestly think that technology can help so much and help all parties", said Gonzalez. "I even think that it should be a free-of-charge type of service to understand the shareholder demand, and the inventories, and the capacity to understand what is better to remove, manage or not."

Coval completely agrees and sees technology as a no-brainer to invest in because the ROI is so high. "As far as investing in technology in the supply chain, I think you get 10X back very easily. So if you put $100,000 into technology, you'll get $1 million back, said Coval. "And you're probably more likely to have a 20x multiplier in that investment."

Safran opens communication lines with Thales to acquire its aero electrical systems

The proposed acquisition from Safran includes Thales Avionics Electrical Systems and Thales Avionics Electrical Motors companies in France.

Safran, a manufacturer of aircraft engines announced that the company has entered into negotiations with Thales, a manufacturer of electrical systems to acquire its aeronautical electrical systems business. This electric power conversion activity also plays a role in power generation and electric motors in the civil and military aeronautics sectors. Thales Group is a French multinational company that designs, develops and manufactures electrical systems as well as devices and equipment for the aerospace, and defence, sectors.

The acquisition proposal between Safran and Thales includes Thales Avionics Electrical Systems and Thales Avionics Electrical Motors companies in France. The Thales electrical system business has sites in the Paris region in Chatou, Meru, and Conflans-Sainte-Honorine, as well as the support, maintenance and production activities for aeronautical electrical equipment in Orlando (USA) and Singapore.

Stéphane Cueille, Chief Executive Officer of Safran Electrical & Power said, "We are delighted with the prospect of joining forces with Thales's electrical teams, which will give us even greater competences over the electrical chain, thanks in particular to their leading skills in electrical conversion. The complementary nature of our expertise will also enable us to provide the market with ever more relevant and effective solutions."

Thales's aeronautical electrical systems business employs nearly 600 people and generated revenues of 124 million in 2021. The Thales electrical conversion business would make a significant contribution to Safran's portfolio of activities, which would expand further in the area of electrical power generation, particularly in the defense and helicopter markets.

For Thales, the potential sale is part of the Group's strategy to refocus on its core businesses in aerospace, defense and security, and digital identity and security. With this acquisition, Safran Electrical & Power aims to pursue its strategy as an equipment manufacturer positioned across the whole electrical chain.

"This project would provide our aeronautical electrical systems teams with an excellent environment in which to develop and would enable them to bring their leading expertise in electrical conversion, power generation and motors to Safran Electrical & Power. In consequence, the proposed acquisition would provide these activities with solid prospects in a market that is showing dynamic growth. More than ever, it would allow Thales to focus on developing its world-class critical avionics solutions." Yannick Assouad, Executive Vice-President, Avionics of Thales.

Safran is a multinational company that designs and develops rocket engines as well as various aerospace and defense-related equipment or their components. The proposed transaction is subject to the information and consultation procedure with the relevant employee representative bodies of Thales and Safran, as well as the usual regulatory approvals. The transaction for acquisition is expected to take place in 2023.

Southeast Aerospace awarded FAA certification for BELL 407 operator station

Southeast Aerospace has received FAA Supplemental Type Certification for the installation of their SEA special mission operator station in the Bell 407 helicopter.

Southeast Aerospace, Inc. (SEA), an Aerospace Solutions company, has announced to have received the Federal Aviation Administration (FAA) Supplemental Type Certification (STC) for the installation of the Southeast Aerospace special mission operator station in the Bell 407 helicopter. The operator station will replace the left-side aft-facing passenger seat in the Bell 407 helicopter meanwhile, maintaining three aft cabin passenger seats. The existing left-side aft-facing passenger seat is removed and replaced as part of the modification.

The operator station for Southeast Aerospace was designed and manufactured as an ideal mounting solution for housing mission equipment in the Bell 407 helicopter to support Airborne Law Enforcement (ALE) missions. Being awarded the STC certification for the operator station will provide a seamless path to meet the regulatory and safety requirements of an FAA-approved installation in the Bell 407. This will mitigate additional costs or requirements for both the customer and installation facility.

"With a dedication to local, state, and federal law enforcement agencies, SEA is proud to announce STC certification for the latest addition to our special mission product line, the Bell 407 operator station. We worked closely with some of the finest TFOs and our engineering team to design a comfortable, effective, and practical operator workstation. By having certified options, we can help agencies access high-quality products while still working with their local avionics modification team. We look forward to providing more options to the ALE community as we continue to develop and certify additional products." stated Nathan Hernandez, Business Development Manager, Southeast Aerospace.

The standard configuration provides provisions for two Macro-Blue MB15W 15 tactical displays. The two identical monitor frames are independently adjustable. Each monitor pivots at the center of the assembly allowing the monitors to be independently rotated towards the operator, up to a maximum of 20°. Once the monitor is adjusted it can be locked in any position within the range of motion. The monitor mount assembly also features a tilting function controlled through a knob below the monitors, giving the monitor mount assembly a tilt of up to 25° to customize the TFOs viewing angle.

The operator station was designed to utilize an integrated electrical disconnect panel allowing for quick and easy removal of the entire cabinet for maintenance and inspections. No changes to the rotorcraft interior are required as the operator assembly poses no interference with the existing interior design. Permanent modifications are negligible during this installation so the aircraft can be returned to its original configuration if desired.

Willis Lease subsidiary to provide dedicated aircraft CAMO for Peach Aviation Limited A320 aircraft

Willis Asset is selected by Peach Aviation Limited as a dedicated CAMO support provider for Airbus A320 aircraft redeliveries taking place at various MROs in Asia and Europe.

Willis Lease Finance Corporation (Willis Lease), a one-stop complete resource for Commercial Aircraft Jet Engines Leasing announced that the company's wholly owned subsidiary, Willis Asset Management Limited (Willis Asset), has been selected by Peach Aviation Limited as its dedicated aircraft Continuing airworthiness management organization (CAMO) provider in support of Airbus A320 aircraft redeliveries taking place at various Maintenance, Repair & Overhauls (MRO's) in Asia and Europe.

Willis Asset Management Limited carries a longstanding technical asset management experience in the field of aviation. Willis Asset confirms the company's commitment to providing efficient, customized and cost-effective solutions while supporting airlines, lessors, MROs and financiers around the globe.

"Willis Lease, and our subsidiaries, are well placed to support our customers with fleet transitions due to our broad capabilities, ranging from CAMO and airframe maintenance to fleet purchases and engine exchanges. We are honored to have been selected by Peach and look forward to exceeding their expectations," said Austin C. Willis, CEO of Willis Lease.

Willis Lease Finance Corporation leases large and regional spare commercial aircraft engines, auxiliary power units and aircraft to airlines, aircraft engine manufacturers and maintenance, repair and overhaul providers in 120 countries. These leasing activities are integrated with engine and aircraft trading, engine lease pools and asset management services supported by cutting-edge technology through its subsidiary, Willis Asset Management Limited, as well as various end-of-life solutions for engines and aviation materials provided through its subsidiary, Willis Aeronautical Services, Inc.

Rolls-Royce awarded engine maintenance contracts worth $1.8 billion by the U.S. military

The first contract includes intermediate, depot-level maintenance for Rolls-Royce F405 engines and the second contract includes engine repair services for AE 2100D3 turboprop engines.

Rolls-Royce, the second-largest maker of aircraft engines in the world has announced to have received two contracts, valued at over $1.8 billion over the next 5 years, to service engines for U.S. Navy and Marine Corps aircraft. The contract was awarded by the U.S. Department of Defense. All branches of the U.S. armed forces operate aircraft powered by Rolls-Royce engines. These jets include the C-130 and C-130J transports, V-22 tiltrotor aircraft, and Global Hawk and Triton high-altitude unmanned aircraft.

The Rolls-Royce engine also powers the Navy's MQ-25 unmanned carrier-based refueling aircraft and has recently won the B-52 re-engine program for the Air Force. Rolls-Royce provides engines, propellers and other equipment for Navy ships and Army vehicles. Rolls-Royce has over 5,000 employees across the U.S. The company has invested over $1 billion in new manufacturing, assembly and test facilities in America since 2015, providing state-of-the-art advanced capabilities.

Adam Riddle, Rolls-Royce, President, Defense Services, said, "We are committed to providing the best engine service possible for our customers, and we are laser focused on ensuring their aircraft are mission ready. We appreciate this vote of confidence from the U.S. Department of Defense as we continue to support our brave men and women in uniform."

The first contract includes intermediate, depot-level maintenance and logistics support for over 200 Rolls-Royce F405 engines that power U.S. Navy T-45 flight trainer aircraft. The contract is based on availability metrics, providing engines as needed to facilitate training Naval and Marine aviators. The maintenance work on the engine will be performed primarily at Naval Air Stations in Meridian, Mississippi, and Kingsville, Texas. The contract is valued at up to $1.013 billion, spanning five years.

The second contract includes the depot-level engine repair services for Rolls-Royce AE 2100D3 turboprop engines powering C-130J and KC-130J transport airport aircraft flown by the U.S. Marine Corps and the government of Kuwait. The contract is valued at $854 million over the next five years, with the work performed at multiple sites in the U.S., Canada and Portugal.

According to Rolls-Royce the contracts reflect the continued confidence shown by the U.S. Department of Defense in the company and its defense services, which support multiple U.S. and allied military fleets around the world.

Embraer conducts flight tests on KC-390 for Portuguese Air Force

The contract for the KC-390 aircraft also includes services and support, as well as a flight simulator for the Portuguese Air Force pilots.

Embraer, a multinational aerospace manufacturer that produces commercial and military aircraft, further strengthened the company's test campaign for the first KC-390 aircraft. The aircraft is being tested for the Portuguese Air Force (FAP). The flight tests are being carried out at the Embraer unit in Gavião Peixoto, in the São Paulo State of Brazil. The test campaign is focused on tests that meet the specific requirements of the Portuguese State, and get certification by the Brazilian authorities, including the National Civil Aviation Agency (ANAC) and the Institute for Industrial Development and Coordination (IFI).

Embraer signed a contract with the Government of Portugal in August of 2019 for the delivery of five KC0390 Millennium aircraft. The contract was part of FAP's process to modernize capabilities and increase readiness for public interest missions. The contract also includes services and support, as well as a flight simulator for the Portuguese Air Force pilots.

The current phase of the test campaign precedes the aircraft's departure to Portugal, where North Atlantic Treaty Organization (NATO) standard equipment will be integrated and certified by the National Aeronautical Authority (AAN) of Portugal and with the involvement of OGMA, a subsidiary of Embraer in Portugal. All activities are being monitored by the Portuguese Air Force (FAP) with the first deliveries scheduled to commence in 2023.

The C-390 Millennium and its aerial refueling configuration, the KC-390, are the new generation of multi-mission military transport aircraft. The aircraft offers unparalleled mobility and payload capacity, rapid reconfiguration, high availability, enhanced comfort, and flight safety, as well as optimized management of reduced operational costs throughout its lifecycle, all on a single platform.

Portugal is the largest international partner of the KC-390 program. Their participation in the development and production of the aircraft is recognized for having a positive economic impact on the generation of jobs, new investments, increased exports and technological advances.

Saab to deliver training aircraft fuselage systems to Boeing

Boeing's order for the advanced training aircraft aft fuselage systems is valued for Saab is USD 71.2 million i.e. (approximately SEK 750 million) with deliveries expected in 2023.

Saab, a Swedish aerospace and defence company has announced that the company has received an order from Boeing for the advanced training aircraft aft fuselage systems. The advanced training aircraft fuselage systems will be produced in Saab's new facility in West Lafayette, Indiana, U.S. The order for the advanced training aircraft aft fuselage systems is valued for Saab is USD 71.2 million i.e. (approximately SEK 750 million). The first deliveries to Boeing are planned for 2023.

"This is an important milestone and underscores that we are delivering on our commitments to our customers and the state of Indiana. This order will allow Saab to continue ramping up production and hiring in West Lafayette. We couldn't be more excited about this new chapter, and the future of our growing aerospace operations in Indiana," said Erik Smith, President and CEO of Saab in the U.S.

The Boeing Company is an American multinational corporation that designs, manufactures, and sells airplanes, rotorcraft, rockets, satellites, telecommunications equipment, and missiles to customers worldwide.

Menzies Aviation secures contract to provide engineering services to LATAM

The agreement will see Menzies provide a full suite of engineering services to LATAM at Sydney Kingsford Smith Airport (SYD) and Auckland International Airport (AKL).

Menzies Aviation, the global aviation logistics specialist, has announced that the company has been awarded its first engineering contract in Australia by long term customer, LATAM Airlines. According to the agreement, Menzies Aviation will provide a full suite of engineering services to LATAM at Sydney Kingsford Smith Airport (SYD) and Auckland International Airport (AKL). LATAM Airlines is one of the largest airlines operating in Latin America with headquarters in Santiago, Chile.

Alistair Reid, Executive Vice President Oceania, South-East Asia and China – Menzies Aviation said, "We are thrilled to announce our latest contract win with LATAM Airlines. We have built a strong relationship with the airline in Latin America, which has assisted with the growth of the partnership through this extension in Australia and New Zealand. Not only does this contract mark a significant expansion of our services for LATAM but introduces our engineering offering to Australia. This milestone paves the way for the growth of our engineering capability across the region in the coming years."

Menzies Aviation an aviation services business providing ground handling, cargo handling, cargo forwarding and into-plane fuelling, based in Edinburgh, Scotland. The contract is a significant success for Menzies as the company plans to grow its engineering services throughout Australia, New Zealand and South-East Asia.

Menzies Aviation currently provides engineering services for a number of other domestic and international, narrow and wide body airlines at Macau International Airport (MFM), Auckland International Airport (AKL), Christchurch Airport (CHC), Wellington Airport (WLG) and Hamilton Airport (HLZ). Menzies will be expanding engineering services to Queenstown Airport (ZQN) by the end of 2022.

Aero signs MoU with Airborne Technologies GmbH to develop reconnaissance systems for L-39NG jet trainer

The MoU between Aero and Airborne Technologies GmbH was signed for joint development and integration of reconnaissance systems (pod) onto the L-39NG jet trainer.

Aero, has signed a Memorandum of Understanding with Airborne Technologies GmbH, a ONE STOP SHOP in the fields of airborne surveillance and airborne geodata acquisition for the joint development and integration of reconnaissance systems (pod) onto the L-39NG jet trainer. The L-39NG aircraft is developed by Aero Vodochody which is the largest producer of aircraft in the Czech Republic. The L-39NG jet trainer has already received type certification without restrictions; hence the jet can be operated worldwide and is compatible with all requirements within the European Union and North Atlantic Treaty Organization.

Aero was presenting the L-39NG jet at the Airpower Airshow in Zeltweg, Austria. The signing of the Memorandum of Understanding between representatives and Airborne Technologies GmbH took place during the event, further extending Aero's collaboration with the Austrian industry. Aero is an aircraft manufacturer and an air forces partner that specializes in the development, assembly, production and servicing of jets.

"The L-39NG platform from Aero is a very attractive choice for our customers. In the case of Austria, the Czech Ministry of Defence fully supports the project and offers full government to government sale and collaboration via its Agency for Intergovernmental Defence Cooperation (AMOS). In addition, the Czech Republic is also offering to Austria participation in jet pilot training and therefore sharing logistics and operational cost," says Filip Kul trunk, Vice President Sales & Marketing at Aero Vodochody.

Aero within the program will offer strategic, long-term industrial cooperation to Austria for at least 20 years. Operating the L-39NG in Austria will bring significant cost savings when compared to training fighter pilots in other countries. The jet will also deliver additional indigenous mission capabilities to the Austrian Air Force.

Currently, Aero is discussing other strategic industrial collaborations with multiple Austrian companies that can be directly involved in the manufacturing process, as well as in the maintenance and support of the L-39NG training platform. L-39NG is the most cost-effective platform for training, light attack and air surveillance missions in its class.

GA Telesis signs MOU with China Southern Airlines Leasing to integrate with GA Telesis Ecosystem

The intention of the collaboration is to integrate with the GA Telesis Ecosystem in order for CSAL and its affiliates to maximize the value of their fleet.

GA Telesis, LLC ("GAT"), a full-service aircraft engine overhaul and repair station has announced the signing of a new memorandum of understanding with China Southern Airlines Leasing ("CSAL"). The two companies have agreed to explore and collaborate on the provisioning of services by the robust GA Telesis Ecosystem. With the GA Telesis Ecosystem, the Company is distinctly positioned, across six continents, to leverage its resources to create innovative solutions for its customers.

China Southern Airlines Leasing's access to the GA Telesis Ecosystem will provide comprehensive solutions related to Component and Asset Life Cycle Management, Asset Value Maximization, Tooling Services, and Ground Support Equipment, as well as integrated processes that include the three MRO Services business units and GA Telesis Engine Services. The intention is to integrate with the GA Telesis Ecosystem in order for China Southern Airlines Leasing and its affiliates to maximize the value of their fleet.

"The commercial aviation market in China ranks as one the most important sectors across all industry categories," said Abdol Moabery, CEO of GA Telesis. "We have played an instrumental role over the past two decades and plan to use that expertise towards the successful execution of this partnership" he further added.

GA Telesis in conjunction with China Southern Airlines Leasing will collaborate to create a partnership with GAMECO, MTU Zhuhai and all China Southern subsidiaries, which will also include the storage, maintenance, cargo conversion, dismantling, and component repair for various aircraft types, engine shop visits and engine parts support programs. Collectively, the enhanced partnership will facilitate engine teardown and trading through MTU Zhuhai.

uAvionix introduces new muLTElink airborne radio manager for SkyLine C2 Network

MuLTElink will allow for seamless and lossless switching between one radio type and another on an aircraft flying at higher altitudes.

uAvionix, a company in communications, navigation, and surveillance solutions for unmanned aircraft systems has announced that it is in development for LTE support and a new airborne radio manager "muLTElink". The new radio manager is being designed for the company's SkyLine Command and Control (C2) Network. Unlike any other solution around the globe, SkyLine monitors and records comprehensive in-flight data for flight operators to prove platform and infrastructure integrity.

SkyLine's ability to roam across multiple ground stations is now enhanced through the additional capability onboard the aircraft, which enables an aircraft to seamlessly transition in-flight between different onboard C2 radios such as ISM and C-Band, or leverage

the integral diversity LTE radio without latency or risk of a lost link.

Avoiding a lost link scenario is critical to Beyond Visual Line of Sight (BVLOS). Every radio and frequency has advantages and disadvantages depending on the geographic location and altitude of the operation. muLTElink allows for seamless and lossless switching between one radio type and another. For example, LTE coverage may work very well under 400' in a given location, but as the aircraft transitions to higher altitudes or more rural locations, the need arises to switch to an alternate link such as C-Band to maintain positive control of the aircraft.

uAvionix offers low SWaP TSO certified and uncertified avionics for General Aviation (GA), Airport Surface Vehicles and the UAS markets. Operational and commercial customers, including the North Dakota Vantis network and the Choctaw Nation UAS Test Site, currently use uAvionix's SkyLine for UAS and AAM.

The workforce at SkyLine consists of an engineering and management team with a combination of experience within avionics, surveillance, airport services, UAS aircraft development, radio frequency (RF), and semiconductor industries.

The International Air Transport Association (IATA) supports many areas of aviation activity and helps formulate industry policy on critical aviation issues.

IATA selects Lufthansa Systems' Lido Sky Data solution to enhance data sharing

Lufthansa Systems' Lido Sky Data is equipped with worldwide standardized navigation information for over 35,000 aerodromes worldwide.

Lufthansa Systems' an information technology service provider for the aviation industry announced that the International Air Transport Association (IATA) has opted to include the company's Lido Sky Data in the Global Aviation Data Management (GADM) platform. The IATA will also include the Flight Data eXchange and Incident Data eXchange safety databases. The data will form a core reference dataset for IATA's aggregated data sharing programs, which are geared towards safety and operational benefits.

The Lido Sky Data is equipped with worldwide standardized navigation information for over 35,000 aerodromes worldwide, including airports, heliports, runways, waypoints, navaids, airways and flight procedures. The data is updated according to the Aeronautical Information Regulation and Control (AIRAC) cycle and is in line with Aeronautical Radio, Incorporated (ARINC) 424 and various other industry standards, such as the Radio Technical Commission for Aeronautics (RTCA) DO-200 and DO-201.

"We are excited to have chosen the Lido Sky Data Solution from Lufthansa Systems", said Olena Vasylchenko, IATA's Operations, Safety and Security Director Business Systems and Performance. "This selection is based on the depth and granularity of the aeronautical information that is available through the Lido solution. These data will form a core reference dataset for our aggregated data sharing programs, which are industry driven and geared towards safety and operational benefits of our members," she further added.

The International Air Transport Association (IATA) is the trade association for the world's airlines. The association represents more than 290 airlines or 83% of total air traffic. It supports many areas of aviation activity and helps formulate industry policy on critical aviation issues.

International Air Transport Association (IATA) supports many areas of aviation activity and helps formulate industry policy on critical aviation issues.

"Lufthansa Systems is very happy that such an important organization as IATA has chosen to include Lido Sky Data in its GADM platform. It represents another great use case of Lido Sky Data which is already widely used in a large amount of applications within the aviation industry", said Michael Sauter, Senior Product Owner Lido Data Solutions at Lufthansa Systems.

IATA's mission is to represent, lead, and serve the airline industry. The International Air Transport Association (IATA) is the prime vehicle for inter-airline cooperation in promoting safe, reliable, secure and economical air services – for the benefit of the world's consumers. The international scheduled air transport industry is more than 100 times larger since the IATA was established in 1945.

MRO BUSINESS TODAY

Our upcoming issue dated

1st October, 2022

SPECIAL ISSUE

TOPIC

‘Aircraft Interiors - Cabin Safety and airworthiness’

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Ramco's ERP software to support MQ-9B SkyGuardian and SeaGuardian RPA systems

Ramco will provide its ERP software platform for Maintenance Repair & Overhaul services to support MQ-9B SkyGuardian and SeaGuardian Remotely Piloted Aircraft (RPA) systems.

General Atomics Aeronautical Systems, Inc. (GA-ASI) has formed a partnership with Ramco Systems Limited, a multinational enterprise software company that offers Aviation, ERP, HRP and Logistics software, for SkyGuardian Global Support Solutions. SkyGuardian Global Support Solutions (SGSS) is a sustainment program introduced by General Atomics Aeronautical Systems, Inc. (GA-ASI) in 2021. Ramco has aviation industry expertise of 25 years which allows them to bring high quality industry MRO digital management practices to SkyGuardian and SeaGuardian users.

As part of the alliance, Ramco will provide its Enterprise Resource Planning (ERP) software platform for Maintenance Repair & Overhaul (MRO) services to support MQ-9B SkyGuardian and SeaGuardian Remotely Piloted Aircraft (RPA) systems. Ramco Aviation MRO Suite delivers end-to-end support of MRO requirements for MQ-9B systems, which includes line, component, engine, hangar, and OEM aftermarket services.

"Ramco's technology leads the industry by providing a turnkey solution for digitizing MRO operations, enhancing turnaround times (TAT), improving customer satisfaction, service level compliance, on-time delivery, and management of other complex business processes," said Sam Richardson, Vice President of Sustainment, GA-ASI.

The SGSS program supports GA-ASI customers operating the MQ-9B. The program provides operators with full-sustainment solutions allowing maximum system availability, commonality, and complete training services. The plan merges resources, especially for regional operators, to create synergies in procurement, management, and depot repairs. MQ-9B customers, operating large or small fleets, collectively realize significant life-cycle cost savings.

"Securing the trust of a world leader in unmanned aerial systems is a landmark achievement for Ramco. Ramco's deep aviation functionality built over the last 25 years, and complemented by next-gen, innovative features, will optimize the operational efficiency of the SkyGuardian program. We are elated to be a part of this paramount MQ-9B program," said Manoj Kumar Singh, President, & Chief Customer Officer – Aviation, Aerospace & Defense, Ramco Systems, Ramco Systems Corporation USA.

The SGSS lowers lifecycle costs for customers by leveraging the cost of sustainment across all MQ-9B customers. This "Consolidated Fleet" approach for SkyGuardian operators provides collective buying power that incentivizes suppliers and subcontractors to create long-term contractual arrangements and innovative solutions to increase customer support and cost savings that are passed down to the customer.

Lufthansa Systems' NetLine solutions to power Thai Airways

Thai Airways has also opted for SchedConnect, the Lufthansa Systems' codeshare management and schedule distribution system.

Lufthansa Systems, an information technology service provider for the aviation industry has announced Thai Airways, the flag carrier airline of Thailandas a new customer for NetLine/Plan, Lufthansa's network planning system and the schedule management solution NetLine/Sched. The carrier has also selected SchedConnect, which is Lufthansa Systems' codeshare management and schedule distribution system. Star Alliance is the world's largest global airline alliance, 13 out of 20 Star Alliance codeshare partners now utilize SchedConnect.

"Thai Airways has been using the efficient and reliable Lido Data solutions and Lido Pilot solutions for many years. Therefore we are familiar with Lufthansa Systems' airline know-how and knowledge and we believe that with these advanced Network Planning, Scheduling and Codeshare Management solutions we can optimize our performance, enhance our working processes and ultimately generate more revenue, with higher profitability" said Mr.Thiti Arayakhun, Head of Scheduling Management at Thai Airways.

With NetLine/Plan, airlines can maximize the profitability of their route network while balancing commercial realities and operational constraints. NetLine/Sched enables the airline to measure the best commercial timings for flights with the optimum aircraft utilization while considering market condition changes and maintaining operational integrity. SchedConnect delivers efficient and automated code share management to the airlines by saving significant time in daily tasks and identify ing ideal and potential codeshare connections.

"We are happy to welcome Thai Airways as a valued customer of NetLine/Plan, NetLine/Sched and SchedConnect. The joint project was initiated with remarkable speed, focus and commitment by both Thai Airways and Lufthansa Systems, resulting in a swift and successful implementation", said Tom Vandendael, Senior Vice President Regional Management and David Parrish, Vice President of Sales Southeast Asia and China from Lufthansa Systems Asia Pacific.

Lufthansa Systems' provides all applications for Thai Airways as an end-to-end service in their Global Aviation Cloud. The security measures are certified in accordance with multiple industry standards and are regularly reviewed in audits. Lufthansa Systems is the customer's single point of contact for the entire technology and service stack.

Emily Tan designated as Country Director and CEO for Singapore by Thales

As the Country Director for Thales Singapore Emily Tan will lead over 2,000 Thales employees and lead the company across three sites in Singapore.

Thales, a multinational leader in advanced technologies, recently announced the appointment of Emily Tan as Country Director for Thales Singapore and as Chief Executive Officer for Thales Solutions Asia Pte Ltd. Emily Tan's appointment will come into effect on 1st September 2022. As the Country Director for Thales Singapore Emily will lead over 2,000 Thales employees and lead the company across three sites in Singapore.

She will also be directing the Thales Group's largest multi-module Digital Identity & Security manufacturing centre located at Ayer Rajah Crescent, and the company's largest avionics production and Maintenance, Repair & Overhaul (MRO) facility at Changi North Rise.

Emily Tan completed her Master's degree in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology MBA, and her Business Administration and Management MBA, from the INSEAD. Emily Tan is a Singaporean native and is selected as the successor of Kevin Chow at Thales Singapore. Kevin Chow will continue his Thales career in a senior leadership role at Thales' Airspace Mobility Solutions business in France.

"I am pleased to welcome Emily to Thales and to support her as she begins charting the way forward for Singapore. Her outstanding career here and abroad, together with her appreciation of key technologies that Thales is investing in, makes her a natural fit to lead our Singapore team. Over the last fifty years, Thales has made deep investments in Singapore to grow our presence and reputation as a digital technology leader here. We look forward to deepening our customer relationships and expanding our business under Emily's leadership, notably in new and fast-growing areas such as 5G, Cloud, Biometrics and FinTech", said Nicolas Bouverot, Vice-President, Thales Asia.

Prior to accepting the position at Thales, Emily Tan spent fourteen years with Shell where she most recently was responsible as General Manager, City Solutions for Shell's Renewables and Energy Solutions business. In this role, she led global teams based in Asia, Europe and the United States, supporting global clients in navigating energy transition and developing cities' decarbonization plans. As General Manager for Shell Bitumen from 2013 to 2017, Emily played an instrumental role in establishing the company's market leadership in Asia and the Middle East.

"Thales' dedication to design, develop and invest in future-proof technologies was what drew me to join the Group. I am thrilled to be a part of a forward-looking and innovative organisation that aims to revolutionise the technologies we use, ensuring they help build a safer, sustainable and trustable future for everyone. The Group's ambitions also aligns closely to that of Singapore's, and I am excited for the many potential opportunities this brings, where Thales can play a collaborative role with key stakeholders to support Singapore as a smart and sustainable nation" said, Emily Tan, Country Director & Chief Executive, Thales in Singapore.

Emily Tan started her career with the Singapore Economic Development Board (EDB). According to Thales, Emily brings a keen understanding of Singapore's public sector where she spent three years in London as Director of EDB's London Centre, and later as the Head of International Policy and Lead Negotiator for International Trade Agreements.

Thales Group is a French multinational company that designs, develops and manufactures electrical systems as well as devices and equipment for the aerospace, defence, transportation and security sectors.

Petr Doberský appointed as the new Chairman of Czech Airlines Technics

The decision to elect Petr Dobersk as Chairman was made by the Board Members; his appointment came into effect on 1 September 2022.

Czech Airlines Technics (CSAT), a subsidiary of Prague Airport and provider of aircraft repair and maintenance and engineering services provider made an announcement of the appointment of a new management team for the company. A decision was made at Czech Airlines Technics' extraordinary meeting to designate Petr Dobersk , a CSAT Board Member as the Chairman of the Board. The decision to elect Petr Dobersk was made by the Board Members. Petr Dobersk appointment came into effect on 1 September 2022. The current Chairman of Czech Airlines Technics Pavel Hale has decided to accept a new professional challenge after serving as the head of CSAT for eight years.

"My goal for the up-coming period is to return CSAT to its pre-2020 scope and then create a solid foundation for the planned further development both in the main segment of base maintenance and in the rest of the divisions. I am happy I can be a part of the development of a company with more than ninety-years' tradition in aircraft repair and maintenance," said Petr Dobersk , Chairman of the Board, Czech Airlines Technics.

Prior to joining Czech Airlines Technics, Petr Dobersk worked for Prague Airport as an Executive Director in charge of accounting, taxes, and financial relations. Before that, he worked in consulting companies in the field of mergers, acquisitions, and financial audits.

The incumbent Chairman of the Board of Directors, Pavel Hale , has decided to leave the company after eight years. He has been working in the field of air transport for over 25 years. Pavel Hale started his career at Czech Airlines and subsequently moved to Czech Airlines Handling. The role of Pavel Hale was terminated on 31 August 2022.

"I am very pleased that CSAT has progressed to the position of an important and recognised player on the market, with an excellent reputation and a stable role in interesting tenders and projects. The next year's planned launch of operations of an aircraft paint shop will ensure CSAT reaches the level of the best companies in the field. I keep my fingers crossed for CSAT and wish the company many more successful years," said Pavel Hale , Ex-Chairman of the Board, Czech Airlines Technics.

Ji í Pos, Chairman of the Prague Airport Board of Directors, wished farewell to Pavel Hale , recognizing his immense contribution to the development and support of air transport at Václav Havel Airport Prague. Ji í Pos also thanked him for successfully navigating Czech Airlines Technics through the most difficult era in its existence, affected by the impact of the Covid-19 pandemics and the insolvency of the company's key customer Czech Airlines. Vladimír Müller is a new Member of the CSAT Board of Directors, responsible for the segments of base and line maintenance.

Holger Ketz to join Kuehne+Nagel as Global Head of Network and Carrier Management

The newly created role of Global Head of Networks will bundle the global management of Kuehne+Nagel's own controlled capacities as well as the cooperation with carriers worldwide.

Kuehne+Nagel, a global transport and logistics company based in Schindellegi, Switzerland announced the appointment of Holger Ketz as the company's Global Head of Network and Carrier Management. Ketz will join Kuehne+Nagel's global Air Logistics management team in Schindellegi, Switzerland. The newly created role is a part of the strategic development of the Air Logistics business. The position was created to bundle the global management of the company's controlled capacities of network and gateways as well as the cooperation with air carriers worldwide. Holger Ketz's appointment will come into effect on January 1, 2023.

Tobias Jerschke, will be the experienced successor to Holger Ketz at Kuehne+Nagel. He is appointed as the Managing Director of Kuehne+Nagel Germany, based in Bremen. The position is currently being held by Holger Ketz. Meanwhile, Tobias Jerschke is currently serving as the Managing Director of Kuehne+Nagel for Belgium and Luxembourg.

Kuehne+Nagel currently has 79,000 employees at more than 1,300 sites in over 100 countries. The Group is one of the world's leading logistics providers. It operates in sea logistics, air logistics, road logistics and contract logistics, with a clear focus on integrated logistics solutions.

International CALENDAR 2022

2022

Date	Event	Venue
15-17 Sept	Vietnam International Aviation Expo 2022	National Convention Center, Hanoi
19-22 Sept	IATA World Financial Symposium	Doha, Qatar
20-22 Sept	MRO ASIA-PACIFIC	Singapore
27-29 Sept	IATA World Cargo Symposium	London, England
4-6 Oct	World Aviation Festival	Amsterdam
06-08 Oct	Istanbul Airshow	Istanbul Atatürk Airport, Istanbul
18-20 Oct	MRO EUROPE	London, UK
18-20 Oct	NBAA-BACE	Orlando, FL
25-27 Oct	IATA Safety Conference	Dubai, UAE
01-03 Nov	Abu Dhabi Air Expo	Abu Dhabi
06-09 Nov	ATCA	Washington, D.C.
9-10 Nov	Asia Connect MRO	Istanbul, Turkey
15-16 Nov	Predictive Aircraft Maintenance 2022	London, UK
05-06 Dec	Aviation Forum 2022	Munich
06-08 Dec	MEBAA	DWC, Dubai
1-3 March 2023	IASEA 2023	Marina Bay Sands, Singapore

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