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A man with a beard, wearing a blue t-shirt and a black watch, is working on the wiring of an aircraft engine. He is looking up at the engine, which is covered in various wires and components. The background is blurred, showing more of the engine and some other parts of the aircraft.

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Flight planning
New systems go

Air Corsica
Above and beyond

Back on their fleet

Aviation recruitment in the post-pandemic era



Sparkling into life

For most engine MRO companies, 2022 couldn't arrive soon enough. Having endured months of uncertainty, stand-downs and a complete lack of demand, operators are slowly getting their fleets back into the air in significant numbers – the knock-on effect of which is the need for engines now. Michael Doran spoke to the firms who have hung on in there to reap the rewards.

After talking with four of the world's major engine MROs, the common theme is one of optimism, flexibility and the agility to adapt to what the market provides. They are investing, hiring, developing new services and adding more skills to be ready for the challenging but positive future they see ahead.

When COVID hit in early 2020, the work profile at engine MRO AeroNorway was turned upside down as demand flipped from the CFM56-5 and -7 to the CFM56-3 powering 737 cargo aircraft.

Chief Operating Officer Neil Russell tells LARA that within six months AeroNorway went from 70% demand for the -5 and -7 variants to 80% working on -3 engines, which kept the business operating through the worst of the pandemic. "We got all the





LEAP 1A engines for the A320neo are part of Lufthansa Technik's engine MRO portfolio. Photo: Lufthansa Technik

“Now as air travel continues to return to pre-pandemic levels it might still take a bit more time prior to the engines requiring their scheduled shop visits.”

**Dietmar Focke, VP Engine Services,
Lufthansa Technik**



fives and sevens that were in the shop out but then the demand dropped from the passenger market, so we really saw a dip from November to around February this year,” he says. “That’s been slowly picking up and we’re seeing the fives and sevens increasing each month, although the numbers aren’t what they were before.”

The big change that Russell has seen is the number of engines coming in for basic repairs, or hospital visits, to keep them running, rather than the complete overhaul work that was more common before the pandemic grounded fleets.

“Mostly engines would come in for core performance restorations to overhaul the five and the seven and put it back out there to run for another 8,000 to 10,000 cycles,” he says. “But when COVID hit, people didn’t

want to invest as much, so they wanted to use the green time by overhauling a module or doing limited worksopes to keep the engine out on wing.”

With more narrowbody aircraft being converted to freighters, the demand for reduced cycle CFM56 engines is increasing.

Russell says: “A freighter engine doesn’t need that many cycles on it, it just needs to have good performance on it to last the number of cycles it’s going to do, so you’re typically seeing 5,000- and 8,000-cycle engines.”

In 2019, AeroNorway had around 100 shop visits – and while it did relatively well in 2020 with 85 visits, the lesser worksopes did reduce revenue. Despite this, the firm retained all its workforce, which Russell believes will pay dividends as demand

increases in 2022. “I know that a lot of overhaul shops let people go but we took the decision to keep everyone,” he says.

“Some let 20 to 30 per cent of their workforce go and some of those won’t come back, so there will need to be a lot of training done.”

HAVING THE NECESSARY CAPACITY

Looking ahead, Russell reveals that AeroNorway has signed three-year contracts with both a -5 and a -7 operator that will each bring in around 30 engines over that period, further vindicating the firm’s decision to retain all their people despite the impact of COVID.

He says: “We’re not a massive shop but we are ahead of some because we have the people, the tooling – and the shop’s the >>>



The CFM56 variants are the backbone of engine MRO at AeroNorway. Photo: Siv Sivertsen

same – so we've got capacity to take in engines. I think this would help us through 2022, so if anybody's got engines that need work, they can send them to us."

Pratt & Whitney (P&W) has a large Asia presence, primarily at Eagle Services Asia (ESA), its joint venture with SIA Engineering and part of the global GTF MRO Network.

P&W's VP Asia-Pacific Business, Mary Ellen Jones, says she is seeing utilisation returning strongly in the US, less so in Europe but lagging in Asia-Pacific. "Of course, freighters have been really the one

bright spot in all of this, and we have a number of our engines powering cargo airplanes," she tells *LARA*.

"In fact, I think more than half of our PW4000-94 engines are on dedicated freighters, and while pretty much every other programme took a hit during COVID, the 94-inch utilisation increased."

Pride of place at P&W is the geared-turbopan PW1100G, and Jones says they have used the COVID hiatus to aggressively retrofit some upgrades to the fleet with minimal disruption to their customers.

"We've got the upgraded configuration in place for new production engines and then the fixes we've made to the existing engines during the downtime has really improved the health of the fleet," she adds. "So now, as things do come back, those airplanes and engines are ready to go."

China is home to one of the largest GTF fleets, with 11 airlines operating more than 200 A320neo aircraft with the support of the global network of 10 GTF MRO engine centres.

P&W announced in late 2021 that it was looking to hire around 250 people across its Singapore facilities, including at ESA, and Jones says that with business coming back they want to make sure they have the people with the right skills to support both the region and beyond.

"We did downsize in 2020 across the company and this is an opportunity to expand our skill base in Singapore," she adds. "As we get more into digitisation and automation, we need employees who have those skills and can help us advance as well."

GLOBAL COMPETITION FOR SKILLS

Jones naturally wants to attract good people into aviation but recognises that some may be put off after seeing how decimated the industry was by COVID.

She also acknowledges that the type of high-level skills aviation is looking for are in high demand globally.

"We want to make sure we're competitive in what we offer but we also believe we've got a very compelling story with the GTF, our focus on sustainability and with our focus on diversity and inclusion," she says. "We want to be a company that appeals to people's values as well as to their skill sets and that's how we want to market ourselves to people."

In a sign of Singapore's aerospace dominance, GE Aviation said in November 2021 it was looking to hire more than 300 people in 2022 to add to the 260 it added in



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Neil Russell, Chief Operating Officer, AeroNorway



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Mary Ellen Jones, VP Asia-Pacific Business, Pratt & Whitney

2021 – which will return it close to a full pre-COVID headcount after it cut 600 from its workforce in 2020.

With a global engine MRO network and capabilities on more than 30 engine types, MTU Maintenance has a great overview of what’s happening in engine MRO and Head of Marketing Katia Diebold-Widmer sees good reasons to be optimistic about 2022.

“At MTU we are performing above average in terms of workload,” she tells LARA. “Our

shops are full again and as such we are optimistic going into 2022 and expect to see further growth in the mid to high 20 per cent range in the commercial maintenance business. We attribute this stability to our broad portfolio.”

MTU has strengths in all the major engine types, including the PW1100G-JM, V2500, LEAP, CFM56, GE90 and PW1500G. To illustrate the breadth of MTU’s market coverage, these engines power the

China is the home to one of the largest GTF fleets with more than 200 A320neos flying. Photo: Pratt & Whitney



Softly does it



WinAir managing director Kyle Vergeer explains how the introduction of software technology has improved engine maintenance in the last five years.

In recent times, the aviation industry has seen a rise in the popularity of engine leasing as more businesses take advantage of power-by-hour and exchange contract programmes.

As a result, companies utilising these engine leasing services need to have a system for tracking and managing all maintenance activities to prove that they have completed all tasks in their maintenance programmes.

Since engine lessors may have different requirements than OEMs, businesses taking on a loan need comprehensive aviation management software with robust change management functionality in maintenance programmes to adapt to varying maintenance requirements.

This type of configuration flexibility is at the heart of WinAir Version 7. Our software users can easily handle changes in maintenance programmes efficiently and effectively.

As users make changes to maintenance programmes in our software, they can immediately see the impact of these alterations, and so can those staff directly affected by them.

WinAir users have access to the comprehensive history of any part, component or consumable. With the click of a button in WinAir, users can easily interchange aircraft engines.

Because the components and parts for engine swaps are already configured in the software, and all historical records on these items are readily available, future maintenance requirements are instantly scheduled in WinAir.



MTU has extensive experience with the V2500, the engine for the A320ceo. Photo: MTU

A320ceo/neo family, 737 family including MAX, B777 and A220 aircraft.

With narrowbody aircraft leading the post-pandemic revival and newer, more fuel-efficient engines preferred, MTU's expertise in the PW1100G-JM, LEAP and CFM56 will ensure its shops are kept busy.

"We are well set up here with our participation in the PW1100G-JM network as well as serving LEAP engines at our facility in China, MTU Maintenance Zhuhai, and with cargo operations remaining strong we've seen great demand for services on the GE90, PW2000 and CF6-80C2," says Diebold-Widmer.

"To sum up, MTU will return to pre-COVID levels earlier than the market, thanks to our product mix and broad customer portfolio.

"Generally speaking, LEAP MRO is currently focused on smaller worksopes such as inspections before returning to

service and quick-turn visits to fix smaller technical issues, while the larger demand for scheduled shop visits is not expected until later this decade."

Where scheduled visits will gather pace is with the CFM56-5B and -7, many of which have not yet had their first shop visit with the market expected to peak for the -7B variant in 2024.

MTU is already planning for visits to build on the CFM56 by introducing services from a third facility in their network at its Berlin-Brandenburg facility.

On the regional aircraft front, MTU's joint-venture with Lufthansa Technik in Poland, EME Aero, inducted its first PW1500G, the powerplant of the A220, in August 2021 and will ramp up services on this engine to 150 shop visits from 2026 onwards.

It also plans to introduce the Embraer E2 engine along with the PW1900 in 2023 at the

EME Aero facility. The pandemic has thrown some serious challenges at Lufthansa Technik, with revenue dropping from €6.57 billion in 2019 to €3.75 billion in 2020. But with an engine MRO portfolio supporting the B737, A320, A350 and B787 aircraft, the signs of recovery are starting to emerge.

In fact, Lufthansa Technik (LHT) has made multi-million-euro investments to build up repair capabilities for LEAP engines in Germany and Ireland, a new engine shop for the PW GTF in Poland and in other existing shops in Germany.

With older aircraft being taken out of service, LHT is doing more worksopes for quick-turn visits because most new engine types don't yet require full preservation work.

SWITCHING BETWEEN AIRCRAFT

LHT's VP Engine Services, Dietmar Focke, says: "Due to the reduced number of flights, operators often chose to switch engines between aircraft rather than having engine shop visits performed.

"Now as air travel continues to return to pre-pandemic levels it might still take a bit more time prior to the engines requiring their scheduled shop visits." To address this

Clean is green

In October 2021 an Etihad Airlines 787 on a commercial flight from London to Abu Dhabi reduced carbon emissions to 72% below those of an equivalent flight in 2019.

The 787 is powered by GE Aviation GENx engines, which for this flight ran on a fuel blend containing SAF and had been cleaned with the GE 360 Foam Wash system.

Foam Wash was developed by GE to improve engine cleaning effectiveness over water wash methods, particularly in hot and harsh environments where the build-up of dust and dirt particles impacts engine performance.

Etihad SVP Technical Paul Kear says that by using Foam Wash in 2021 the airline expects

to realise significant fuel savings and a reduction of more than 7,000 metric tonnes of CO₂ for the combined GENx-1B and GE90 fleets compared to water wash methods.

In environments such as the Middle East, very fine dust can be ingested that builds up and becomes baked to the engine core. GE has developed a detergent to break down the binders in this hardened layer of dust, along with a self-contained mobile cart that injects the solution and catches it as it flows out.

GE has issued licences to seven airlines, including Etihad, Emirates, Qatar, Royal Jordanian, Saudi Arabian, and Air India. In China, MRO HAECO Engine Services (Xiamen) is also a licensed service provider



Etihad Airlines expects to reduce CO₂ emissions significantly by using 360 Foam Wash.

Photo: GE Aviation

for the 360 Foam Wash. The system is approved for GE90, GENx, CF34 and CF6 engines and GE is continuing trials with customers in other regions and environments.





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Katia Diebold-Widmer, Head of Marketing, MTU Maintenance

development, LHT has adapted its SmartLIFE service with MRO solutions for using the green time in the engines on parked aircraft.

By swapping engines or modules at the optimum time, operators can postpone or even avoid larger shop visits – significantly reducing MRO costs.

LHT also supports operators with its InFIELD mobile engine services, which are

available for CFM56, V2500 and LEAP-1A engines. Depending on the scope of the repair, services such as borescopes are offered InFIELD or InSTATION and wherever possible crews provide the service at the operator's location.

“Our customers want to avoid costly shop visits right now and we take the airline customer's point of view and aim at minimising cost per flight hour by increasing

the engines' time on wing with smart maintenance and development of repairs,” Focke tells LARA.

With the 737 MAX returning in numbers, LHT has started preparing to maintain the LEAP 1B engines.

But due to the relatively long period of time some aircraft have spent grounded, many MRO tasks that are triggered by flight cycles or flight hours are being postponed. ■

AIRCRAFT DOOR BARRIER (SAFETY NETS)

“Are your staff adequately protected against the risk of falling from height?”

- Quick and easy to install, no tools required.
- Sprung loaded quick release pins, securely lock in to position.
- Visual and physical safety measure.
- Use when doors are left open to cool the aircraft in high temperatures.
- Used by MRO maintenance engineers.



Photo used for illustrative purposes only

Door nets to fit: Airbus - A318 | A319 | A320 | A321 plus NEO
Bombardier Q400, Embraer E170 | E175 | E190 | E195
Boeing 737 - Coming soon.

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