



MRO FOR THE CFM56 FAMILY

1. Lufthansa Technik is seeing strong signs of recovery in CFM56 work; it recently won new contracts with Frontier Airlines and Royal Jordanian

CFM56 family MRO providers have adapted as a result of the Covid-19 crisis and found new ways of working, and are now looking to the future with renewed optimism, as **Luke Chamberlain** discovers

Despite production of the CFM56 engine winding down – with the final deliveries of the Boeing 737NG and Airbus A320ceo aircraft having completed in 2019 and 2020 respectively, and the production of spares due to end in 2024 – the narrowbody engines were the first to be reactivated following the Covid-19 crisis. And according to Marcel Gerth-Noritzsch, global product manager at MTU Maintenance, they will continue to be the engines of choice during the ongoing recovery.

“We are prepared for this and expect to see our global MRO levels recover in 2022/23, which is earlier than market predictions, which forecast engine MRO recovery in 2023/24,” Gerth-Noritzsch reports. “We have retained our highly qualified staff during the pandemic and are ready to support airlines once recovery occurs. MTU Maintenance carried out more than 150 CFM56 shop visits last year and is well on the way to achieving pre-pandemic levels for this engine programme in 2022.”

Lufthansa Technik's CFM56 programme is also showing signs of recovery. According to the company's head of engine overhaul, Oezguer Yesilkaya, the company is currently operating on a “significantly increased level” compared to 2020, and in recent months has won new contracts with the likes of Frontier Airlines and Royal Jordanian. However, with a global shortage of parts supply for repair services, “managing our supply chain in order to avoid disruption for our operation and ultimately safeguarding our airline customers' operation is our key target”.

With record demand for air cargo, one of the challenges of the Covid-19 crisis, Aero Norway notes the high number of ‘classic’ freighters now at its facilities. “Our focus has always been to get more -5Bs and -7Bs into the shop. In 2019, 63 per cent of our inductions were CFM56-5Bs and CFM56-7Bs, with

37 per cent CFM56-3s [the first derivative of the series],” says the company's global sales and marketing director Ramon Peters. “Our forecast for 2021 was 72 per cent -5Bs and -7Bs, and 28 per cent -3s, and we had paved the way to encourage those customers into the shop.

“However, the actual split in inductions between CFM56-5Bs/CFM56-7Bs and CFM56-3s has been 52 per cent to 48 per cent. Although this is not the worst-case scenario by any means, it is certainly not what we had envisaged and planned for. We would of course like to focus more on the -5Bs and -7Bs, however supporting our customers remains a priority and we have already agreed

to support their CFM56-3 requirements until 2026. Although these rewards may be limited in the short term, in the long run business will perpetuate as these carriers will fly the new generation engines in the future, so we can undertake the -7B work.”

**“The CFM engine
MRO market
has always
been very
competitive”**

New ways of working

In many cases, CFM56 service providers are turning to new ways of working as the industry recovers from the Covid-19 crisis. As Peters explains, Aero Norway continues to come up with “creative and clever solutions”

to help its customers. “We are constantly reassessing, re-evaluating and looking for ways to improve our processes in pursuit of reduced turnaround times.

“In 2019 we invested in a state-of-the-art high-speed grinder, which was followed by an upgrade to our plasma spraying machine and most recently to our static balancing machine. We are also carrying out numerous small projects around the shop to benefit our customers and this time has given us the opportunity to complete these.”

In terms of its workforce, Peters says the company was initially forced to modify working patterns to accommodate social distancing measures – but this has benefitted Aero Norway in the long-term. “We have followed all the guidelines set by the Norwegian government with regard to restrictions to visitors in the



1. MTU introduced the CFM56-7B to its facility at Berlin Brandenburg Airport last year
2. Lufthansa Technik says it improved its services portfolio throughout the Covid-19 crisis
3. Aero Norway has invested in new equipment and upgrades for the benefit of customers

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shop, and business travel,” he says. “We have found that having engines for repair has enabled us to provide a socially distanced physical barrier for our team who can position themselves at intervals around the engine; any collaborative work or checks have been carried out with social distancing in mind. This was only for a short period, but it ensured Aero Norway kept all of its workforce and maintained its work culture.

“This means that we are still staffed on 2019 levels and even hired six new technical apprentices in September. Getting back on track for an increase of CFM56 MRO work and preparing for LEAP MRO are our main goals and we look to the future with confidence.”

MTU’s Gerth-Noritzsch stresses the importance of adapting its approach according to operator needs. “The MRO focus for operators with younger fleets tends to be on generating more flight hours with customised solutions. We achieve this with intelligent fleet

management that optimises removals across a defined period. Such services are complemented by predictive maintenance, based on engine trend monitoring, on-site services and spare engine support,” he explains.

“This is particularly key at the moment as operators turn to smaller workscopes and on-site fixes to extend time on-wing during the crisis. Such workscopes are also highly suited to CFM56 engines, as they were designed to enable more on-wing fixes than previous generations and are built in such a way that modules can easily be swapped as needed.

“Managing our supply chain to avoid disruption is our key target”

“Once an engine comes into the shop, our customised workscoping, EASA-FAA approved repairs and our engineering expertise help lower overall costs. We call this programme ‘PERFORMPlus’. This is particularly relevant for customers preparing for increased flight schedules later in the year and we are seeing a number seeking full shop visits and carrying out long-term planning.”

MRO costs naturally increase as engines age, and Gerth-Noritzsch says this is why MTU also offers “smart strategies” for mature engines. “Our fully independent solutions include alternative MRO, such as smart repairs and tailored

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workscopes to suit operators’ remaining flight periods as well as material salvation and intelligent teardowns,” he says. “Furthermore, these services can be combined with alternatives to MRO such as leasing in of green-time engines or exchanging engines for the remaining period until phase-out.

“This service solution goes by the name of ‘SAVEPlus’. We expect increased utilisation of used serviceable material (USM) in the coming years. and, through our extensive experience and material management services from our leasing company MTU Maintenance Lease Services, are confident we can provide a reliable supply of USM for customer shop visits at fair market prices.”

Smarter digital services will also help to support an effective post Covid-19 industry restart, according to Gerth-Noritzsch. Summarising how MTU is embracing predictive maintenance,



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1. MTU expects to see a trend towards ad-hoc hospital shop visits and smaller worksopes over full-scale core performance restorations

Adapting to customer requirements is one way for CFM56 MRO providers to stand out from competitors, according to Peters. "At Aero Norway, we distinguish ourselves mostly by the way we adapt to our customer requirements. We offer multiple tailor-made added-value solutions, varying from technical, financial, material, logistics or a turnaround perspective. We go the extra mile in fulfilling customer requirements."


Looking forward

Aero Norway remains positive there will be an upturn in MRO requirements for the CFM56 engine family over the coming year. However, as Peters puts it, "we do not know exactly when it will happen. By the end of 2022 to mid-2023 we would expect to see an increase in demand for CFM56-5B and -7B and LEAP maintenance worksopes. Single aisle aircraft operation is rapidly increasing in Europe, and we expect to see a shift in MRO requirements in the coming year."

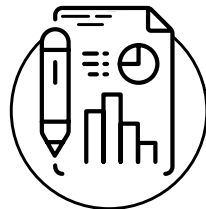
Yesilkaya says Lufthansa Technik is "very much looking forward" to 2022, holding the view that while domestic air traffic and the need for CFM engine MRO services are strong, capacities in the market remain limited. "Airlines should make sure they secure themselves – right now – sufficient capacity for engine MRO services for the next few years," he says.

MTU expects to see a trend towards ad-hoc hospital shop visits and smaller worksopes over full-scale core performance restorations, which Gerth-Noritzsch says is one reason the company has added on-site capability around the world and opened a dedicated facility near Berlin.

"We expect to see a continued trend away from traditional planning with fixed maintenance intervals to more

individually tailored solutions," he says. "Some airlines are concentrating on short-term savings with cash preservation as the main objective, while others are focusing on long-term planning. MROs must flexibly meet both goals to provide the best solution for customers." 

"We are constantly looking for ways to improve our processes"



2023

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he explains: "At MTU, our engine trend monitoring tool was introduced in 2006 and is continually developed. In 2021, we took it to the next level and integrated it into our proprietary engine fleet management software 'CORTEX' to support our customers. Using CORTEX, an intelligent maintenance costing and planning tool, we generate engine fleet management scenarios and worksopes.

"Smart predictions by use of artificial intelligence enable customised, immediate and proactive MRO planning options not currently available on the market today. Fleet planning scenarios can be immediately and endlessly adapted as the financial, technical, operational, environmental and market considerations continually change – as we are experiencing daily at this time."

Competition

A positive sign of recovery is that competition remains strong among CFM56 MRO providers, with Air France Industries KLM Engineering & Maintenance, ST Engineering, SR Technics and StandardAero among the major players in the field [besides those already mentioned]. According to Gerth-Noritzsch, competitiveness has only increased as a result of the pandemic. "The CFM engine market has a large number of MRO providers and has always been very competitive – though we would add this is good for

customers, who are sure to get the most competitive offers for services."

Last year, MTU introduced the CFM56-7B to its facility at Berlin Brandenburg Airport, making it the third within its network capable of servicing the engine family. "This signals our commitment to the engine programme well into this decade," says Gerth-Noritzsch. "We also opened a new on-site services space near Berlin with quick-turn docks that is specialised in on-site and near-wing events as well as hospital shop visits. The first CFM56

engine was in this area in December. This success is something we intend to grow upon, and we aim to become the number one on-site and near-wing engine service provider in Europe with this facility."

Lufthansa Technik's Yesilkaya notes that with the company's "on-site service teams and our global network of repair stations, we are well positioned to support our customers". During the pandemic Lufthansa Technik "kept working on our strategic fields of actions and improved our services portfolio and competitiveness to increase our market share".

1. AFI KLM E&M aims to develop software which includes all the information a mechanic needs, supported by an iPad and apps



Aircraft maintenance, repair and overhaul organisations are increasingly adopting digital solutions to unlock value through end-to-end digitisation processes. In parallel, the industry is progressively getting rid of paper records, but there are still requirements to keep such paper records in some areas of the business.

Moving away from paper in an efficient way is a challenge many MROs are currently facing, according to Air France Industries KLM Engineering & Maintenance (AFI KLM E&M). "Though software is already used for planning maintenance during maintenance execution, paper is a standard many MROs still use," the company says.

Transition to digital

According to Mark Joppe, project leader paperless maintenance at Lufthansa Technik, the industry is definitely transitioning towards digitisation. "While some airlines and MROs are targeting the theme of a fully digital company, others are still in the early stages of digitisation," he explains.

"THERE IS SUFFICIENT ACCEPTANCE OF THE TECH TO ALLOW ELECTRONIC TASK CARDS TO SUCCEED"

Illustration: Phil Couzens

"Individual airlines and MROs experience different progress depending on the target output and possibly deviating from it under the framework conditions of the prevailing pandemic and the associated investment opportunities or obstacles."

Recent developments in remote collaborations and virtual inspections have

stretched the boundaries of technical records to also manage new forms of data like voice and videos with the ability to archive and audit for regulatory purposes, according to Saravanan Rajarajan, director of aviation solution consulting at Ramco Systems. "The rapid progress and maturity of mobile technologies and digital content availability has made shop floor digitisation a reality," he says. "Paper-based recording of observations and findings are replaced by digital recordings."

An MRO's success in working fully digital can be measured by the amount of functionalities it can offer in a digital way to a mechanic, according to AFI KLM E&M. "We develop software which is intended to include all the current and future information a mechanic needs to be fully 'hands-on-metal' supported by an iPad with high-quality apps," the company says. "The current state of development of these apps is that mechanics can already execute and electronically sign their maintenance tasks, consult aircraft documentation, monitor progress of the overall maintenance check, appoint cards for execution, and create faults and non-routine cards, among others."



Indeed, most aircraft OEMs now deliver documentation such as aircraft maintenance manuals and task cards in an electronic format which makes it a great source to generate digital 'mechanic-friendly' work instructions, observes Julien Methot, head of consulting services, projects & digital solutions at Swiss AviationSoftware. "Many airlines and MROs have rolled-out this technology using iPads for their line and base maintenance. About 40-50 per cent of our customer base have either completed or started an implementation of such digital task cards," he says.

OASES' product manager Adam Frost comments: "We are starting to see electronic task cards becoming available for conducting maintenance activities, although fewer organisations have implemented them so perhaps there are still some practical challenges to overcome. There is now sufficient acceptance of the required technologies to allow electronic task cards to succeed."

Dealing with older paper records

Having everything digital and well organised – including older records – is a goal every MRO should have, according to AFI KLM E&M. "Searching for maintenance records in a paper environment is time consuming. A well-organised digital environment is the solution to this. One should start with organising the environment well and then decide for which maintenance records it would be valuable to digitise."

Lufthansa Technik's Joppe observes that in the case of older aircraft maintenance records of still active aircraft, supervisory authorities could agree to digitise them with the aim of destroying the physical documents. "A digitisation of physical aircraft maintenance records with the aim of better and faster data access has long

