

April 2021

AVI**TRADER**TM
publications

MRO

CFM56
Pandemic
tests engine
market

Regional Spotlight



Americas

**Cabin
Interiors**
*Adapting to
change*





AIRFRANCE / KLM
INDUSTRIES Engineering & Maintenance

CFM56 Engine Special Report

Turning challenges into opportunities

The CFM56 engine market is showing signs of recovery from the worst effects of the COVID 19 downturn and with changes in the supply chain, **Keith Mwanalushi** observes that the nature of opportunities in the market have also changed.

There will be several different factors influencing CFM56 MRO demand.
Photo: AFI KLM E&M



Industry experts at aviation consultancy firm IBA recently said the aircraft engine market is now well established on the path to recovery, but specific factors such as the ability of MRO providers to build back capacity will significantly affect its timeframe.

Figures released by IBA show that the number of engine flight hours (as of March 2021) was plateauing at around 1.4 million per month, having plunged from around 2.8 million at the end of 2019 to less than 600,000 in April 2020. The reports indicate that full scope engine shop visits were down by 70% compared to pre-COVID levels and engine MRO revenue by 50%. However, IBA is now seeing three-month lead times for some shop visits, indicating that engine MRO providers have re-structured their operations to better match capacity to demand.

In fact, CFM56 engine MRO specialists Aero Norway changed their business model

rapidly at the onset of the pandemic. "We re-forecasted early on in 2020 and predicted that there would be a shift towards hospital worksopes rather than full engine inductions," recalls Glenford Marston, Aero Norway's CEO. And, for their apprentices, Marston says COVID enhanced their training and enabled them to progress quicker than they would have done in a theoretical environment. "For each apprentice working on an engine, there is a dedicated senior mechanic supervising them. This has actually made our shop more versatile as we were practicing this right

across the field and moving our apprentices from core performance to LPT to fan, but it was also essential as we needed a multi skilled workforce to man our additional repair bays."



Glenford Marston, CEO, Aero Norway

Marston says Aero Norway are fortunate to have a loyal and dedicated team on the shop floor, many of whom have been with the MRO since they were apprenticed themselves. "Although they did not require any additional training, we did have to undertake this for the inspection department as we had to redistribute our bench



GA Telesis' engine overhaul facility in Helsinki, Finland.
Photo: GA Telesis

inspectors across all repair bays to fulfil the demand of our customers. The reality of this was instead of the parts going to the inspectors once they had been cleaned, and subjected to NDT, the inspectors were required to go to the repair bays to carry out their duties as we were endeavouring to complete the surgical strikes as quickly as possible."

In terms of the COVID-19 pandemic and how it has changed current and projected MRO market for the CFM56 platform, Russell Shelton, President Engine Strategy Group at GA Telesis observes that the nature of the opportunities in the market has changed. He says regular maintenance has been replaced by a set of minimums required to operate the aircraft in service. "Restorative shop visits have been set aside for now in favour of lighter workscopes and shop visit substitutes such as engine exchanges or the rotation of green time alternatives within fleets."

Shelton has also seen the supply chain alter – "Gone for now are the days when the OEM could use their macro-level models to predict the number of full shop visits growing or contracting by X% per year. They are now attempting to have individual MROs provide orders with quite long lead times to satisfy future parts demand. The consequences of this change in posture are masked today by the depressed market. The real fear comes when demand returns, and there is not a sufficient supply of critical parts such as turbine blades and LLO."

Like some other engine platforms, the COVID pandemic resulted in a notable reduction in CFM56-7B demand during 2020, with a gradual market recovery now anticipated through 2023 or beyond. "The pandemic's impact has varied on a regional basis: the Chinese domestic market has seen the smallest impact, with the domestic U.S. market also faring relatively well. By comparison, the European and Asian markets – especially for intra-regional travel – have been hard hit, in large part because of national travel restrictions," notes David Green, VP/GM CFM56/CF34 at StandardAero.

There will be several different factors influencing CFM56-7B MRO demand in the coming years. Green points to the retirement of some 737 NG aircraft – especially older or high-time jets – is expected, although as Safran itself has already noted, the number of CFM56-5B/7B-powered aircraft retirements witnessed in 2020 (60 aircraft) was below the level seen in 2019 (108 aircraft).

"Several major operators have stated that they expect to downsize their fleets, in anticipation of a multi-year recovery, and this will



Russell Shelton, President Engine Strategy Group at GA Telesis



David Green , VP and GM CFM56, CF34, StandardAero

inevitably have some impact on the aftermarket, notes Green. He adds: "Conversely, while MRO demand traditionally lags aircraft activity we do anticipate an early recovery in MRO work, given the high degree of 'deferred' maintenance over the past year

associated with operators moving to avoid capital outlays wherever possible. We also expect to see the impact of early retirements somewhat offset by the 737 NG's increasing popularity in the cargo market, where converted passenger aircraft are replacing older 737 Classics previously operated."

Unlike airframe maintenance, engine maintenance depends on cycles, not on the calendar, resulting in lower global shop visits. Prior to the pandemic, SR Technics were seeing an annual increase in shop visit inductions and had a record first quarter in 2020. "During the pandemic, shop visits dropped, but since January 2021, there has been a steady flow of inductions again, particularly among customers in regions with large domestic markets where flying has increased since the spring of 2020," reports Caroline Vandedrinck, Senior Vice President Business Development at SR Technics.

In discussions with customers, SR Technics are hearing that the demand for shop visits will begin to increase again. "Customers are



Caroline Vandedrinck SVP Business Development at SR Technics

still looking for alternatives such as engine exchanges, green-time engine leasing, or lighter shop visits. We believe the recovery will take some time and will depend on vaccine rollout and the easing of lockdowns," continues Vandedrinck.



**AERO
NORWAY**
Quality Engines

unequivocal precision
assured engine performance

Aero Norway is an independent engine MRO delivering globally recognised flexible worksopes for CFM56-3C/5B/7B series engines.

Skilled and experienced technicians combine a fresh Norwegian spirit, with a long and proud international heritage to provide fast turnaround, quick slot inductions and a range of highly competitive and reliable engine services that are multi-release FAA, EASA, CAAC amongst many others.

It's precisely why operators choose Aero Norway.

aeronorway.no

SR Technics expect a decline in CFM-powered aircraft as airframe OEMs entice airlines to buy new LEAP and GTF-powered aircraft, but the sheer number of CFM-powered aircraft delivered over time gives confidence that there will still be a demand for CFM56 shop visits. "Some parked aircraft will be retired, and green-time engines will be harvested before they are torn down. The teardown will result in used serviceable material, which will help reduce the cost of shop visits in the future." However, Vandendrinck notes the need to be realistic about the supply of such material. She says airfoils and Life Limited Parts (LLPs), the most interesting used serviceable material from a cost standpoint, will not be available in large quantities as they will be used up before the engine is retired.

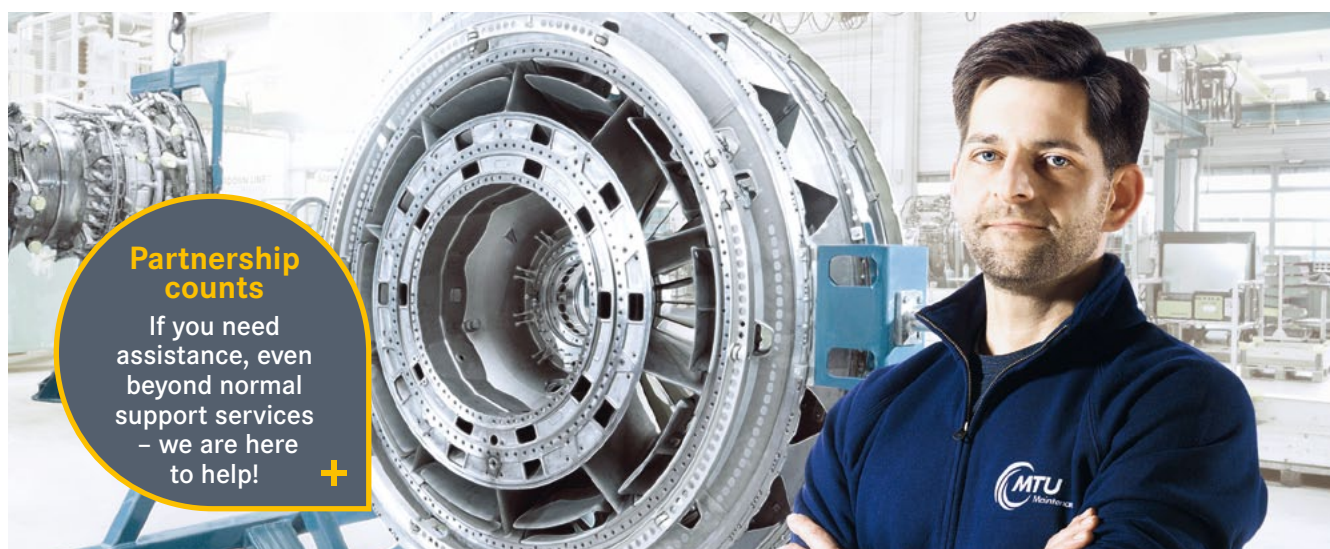
Anthony Spaulding, Executive Vice President at Magellan looks back during the height of the pandemic whilst many aircraft



Anthony Spaulding, Executive Vice President at Magellan

were parked, Magellan kept proactive repair of material that supports airlines and MROs to a minimum. "We have seen an uptick in the request for material as airlines are reactivating aircraft and MROs

are restarting pre-COVID WIP or preparing for post-COVID work being planned. With these requests, we have been reviewing our inventory to meter out material for repair to meet the gradual uptick in demand for the CFM56 as well as other narrow-body and regional engine types." Spaulding stresses that this is especially important to consider as engine MRO picks up the capacity build-up in available personnel to turn the wrenches and repair the piece parts, this will take time to reach pre-COVID levels. "Therefore, we don't want to be fighting for available capacity especially in the piece-part repair space when MRO's will be flooding those outside repair shops. We would expect some pressure on operator-affiliated MROs as they manage man-hours and the fleet reactivations of their associated airline(s). There may be some unpredictability on shop lead-times as a result so a having diverse repair network really helps."



We are your engine experts



Our people make the difference. We are passionate. We are dedicated. We marry engineering with intelligent creativity. And we never give up unless an optimal solution has been found. As the global market leader in customized solutions for aero engines, MTU Maintenance supports you with the right product across the lifecycle of your engine. From innovative maintenance, repair and overhaul (MRO) services, to integrated leasing and asset management.

Contact us and find your solution today.

www.mtu.de/en



“Customers are still looking for alternatives such as engine exchanges, green-time engine leasing, or lighter shop visits.”
Caroline Vandedrinck, SR Technics

Demand for shop visits will begin to increase again.
 Photo: SR Technics

Considering that airlines have deferred engine maintenance activity to assist with cash preservation because of the current environment, naturally this has had a direct impact on demand for USM and the purchasing behaviours of material planners, remarks James Bennett, Commercial Director at AerFin. “We have therefore been extremely proactive in aligning our repair activity with the reduced demands of our customers to ensure that fast-moving, high quality parts are available in overhauled condition and ready for immediate dispatch. With our principal focus remaining the regional and narrow-body markets, along with our portfolio of cargo customers we have managed a reliable and steady USM supply chain, without any major impacts to our trading activity,” he states.

Despite the predicted increase in early retirements of CFM56 equipped aircraft, Bennett does not expect this to necessarily reflect a drop in USM spend. He explains: “We are seeing a number of airlines now

delay new aircraft orders and extending the life of their current fleets, as a result we expect to see a significant spike in MRO activity, with demand for USM increasing in line with this. So, whilst overall aftermarket spend may drop, the demand for USM will increase in a more cost-conscious environment.”

At Vortex Aviation [a division of Kellstrom Aerospace Group] the customer base is mainly airlines and lessors that have a need for specific, targeted workscopes to return an engine back to service without the associated workscope creep typically experienced at larger MRO facilities. “Our customers, like the entire aviation industry, have become much more cash conscious and look to minimise expenditure as much as possible whilst maintaining strict quality needs; therefore, we saw increased pressure to have very targeted workscope, use of USM and performing material exchanges where possible to keep overall costs to a minimum,” tells Jeff Lund, CEO.

In normalised operating conditions, almost 40% of Vortex Aviation revenue originated from on wing services, which have been significantly impacted due to the travel restrictions imposed by governments around the globe limiting the company's ability to send mechanics to remote aircraft locations. In responses to this, Vortex Aviation established other methods of providing support to its customer base utilising technology to offer remote and virtual services for on wing troubleshooting.

Along with the engine maintenance, Vortex saw engine storage and preservation triple as operators ceased operations and lessors took back aircraft. “This enables Vortex to be in a strategic position to provide support across our global network of locations in the United States, Europe, and Asia.

“In the future, Vortex anticipates an even higher demand for on-wing and hospital MRO support for the aircraft and engine market as operators and lessors take their



Jamil Diwan, EVP Sales and Business Development at HAECO.

aircraft out of storage to current and new operators globally," states Lund.

HAECO Global Engine Support (GES)'s business in the US is mainly quick turn hospital visits, lease returns, engine maintenance, field service and engine/component storage. GES has noticed that higher time CFM engines have been removed and replaced with lower time engines to push out expensive shop visits. "With post bow wave lease returns and repossessions experienced during 2020, we expect to see fewer lease returns in 2021 than at the start of the pandemic," says Jamil Diwan, EVP Sales and Business Development at HAECO.

For the CFM56-5B engines, Diwan observes this has been a somewhat steadier market even with all the impacts of the COVID-19 pandemic being considered. "We think this is mainly due to fewer engines in the market, including spares, as compared to the CFM56-7B. Again, from our standpoint, the CFM56-5B market is not as bad as it could have been.

"MROs that focus on engine shop visits are suffering, again due to high time engines being removed and kept as spares, as well as significant reductions in utilisation rates," Diwan highlights.

On mature -5B engines (A320 family application) and -7B engines (737NG application) at Magnetic MRO, they do expect significant number of engines to appear on the market

due to retirement of their aircraft platforms. In 2020 some 180 A320 and 737NG were retired bringing 360 engines to the market and its likely 2021 will bring even more engines according to Alexey Ivanov, Executive Sales Director at Magnetic Engines.

"Certainly, not all those engines will go for teardown as some of them will continue flying as green time engines but still the amount of material appearing on the market from those engines will push the price down. Moreover, we are now in a situation where the number of heavy shop visits dropped by some 30-40% compared to pre-pandemic times and demand for the spare parts dropped as well." Ivanov has

heard industry talks that mention all those shop visits will come back and he anticipates another wave of -5B / -7B repairs (like what happened in 2018-2020) assuming the market settles down with COVID and aircraft return to service, but ultimately it may still take 2-3 years for it to come.

However, CFM56 is still the most popular engine in the aviation history and sooner or later demand for repairs will return states Ivanov. "It's very hard to make some quantitative estimates but I'd say general price of USM for those engine types will go down by 15-30% and it depends on the type of material."



"We are now in a situation where the number of heavy shop visits dropped by some 30-40% compared to pre-pandemic times."

*Alexey Ivanov,
Magnetic Engines*

Alexey Ivanov, Executive Sales Director at Magnetic Engines.