FREIGHTER TRENDS

PRESENTS

MROX

THE NEXT GENERATION MRO

MRO | P2F | AEROSPACE | TECHNOLOGY

SEPTEMBER 2026 | ISSUE - 3



CFM
ENGINES OVERHAUL

LANDING
GEAR OVERHAUL

COMPONENTS
MRO

IAI, MAMMOTH
P2F TRENDS

A PLAZA TIMES PUBLICATION

PEM-AIR SELECTS RAMCO AVIATION SOFTWARE

Ramco Systems Corporation, a subsidiary of Ramco Systems Limited, announced that Pem-Air, and accessory repair provider, has selected Ramco Aviation Software as the technological foundation for its engine MRO operations.

Pem-Air has been rapidly growing, adding support for larger engine platforms such as the GE90 and Trent 700, as well as next-generation engines, including CFM LEAP. Ramco Aviation Software will power



operations across this expanded engine portfolio as Pem-Air meets the demands of tomorrow's fleets.

With modules for Maintenance Planning, Engine Maintenance, Supply Chain, Quality & Compliance, Engineering, and Finance, Ramco Aviation Software will provide Pem-Air with a single integrated system that connects every stage of a shop visit. In addition, Ramco Anywhere mobile applications will support technicians with digital task cards and electronic sign-offs, enabling Pem-Air's move toward paperless operations.

Ramco Aviation Software's capabilities extend deep into the engine MRO workflow, covering Contracting and Configuration Management, Work Scoping and Production Planning, Marshalling and Kitting, and Technical Publications, with Resource Optimization supporting smarter staffing and workload planning across every shop visit.

Virgil Pizer, Chief Executive Officer, Pem-Air, said, "As we scale our engine MRO capabilities, we needed a platform that could keep pace with that growth. Ramco stood out in our evaluation for its end-to-end lifecycle coverage, deep engine MRO expertise, and strong credibility in the U.S. market."

Manoj Kumar Singh, Chief Customer Officer — Aviation, Aerospace & Defense, Ramco Systems, said, "We've built Ramco Aviation Software to meet the segment's evolving demands, and AI sits at the center of that work, helping Pem-Air continue adding value to its customers by, for example, reducing turnaround times. We look forward to supporting Pem-Air in the years to come."

VALLAIR GROUP APPOINTS VALENTINA PILSCHIKOVA AS DIRECTOR ASSET TRADING



Vallair has appointed Valentina Pilschikova, as Director Asset Trading. Responsible for Vallair's trading activities for both aircraft and engine assets, she will focus on the development of new business opportunities, strengthen relationships with customers and partners, identify asset acquisition and sales opportunities, and work closely with internal teams to deliver the best solutions for customers.

Pilschikova says, "I believe that people do business with people they trust. Builstrong relationships has always been the most rewarding part of my job. I try to be open, reliable and solution- oriented, and I believe that when you keep your word and work towards a common goal, success follows naturally."

AAR CELEBRATES AIRFRAME MRO FACILITY EXPANSION IN MIAMI

AAR CORP, celebrate the expansion of its Airframe MRO footprint in Miami. Constructed to meet maintenance capacity requirements for a long-term commercial airline, the new facility will support three lines of heavy maintenance and is expected to induct its first aircraft this autumn. The expansion adds 100,000+ square feet to AAR's Airframe MRO facility at Miami International Airport. The project was made possible through AAR's collaboration with the airport, Ryan Companies, HPM, and federal, state, and local partners.

The additional work supported in the new facility creates 200 new full-time jobs with AAR and brings economic benefits to Miami-Dade County. AAR is actively staffing the new roles through its established workforce development pipeline and collaborative initiatives with local educational institutions, reinforcing the Company's long-term commitment to talent development and community investment.

"The expansion of our Airframe MRO facility in Miami reflects both the strength of our operations and the confidence customers place in AAR to deliver quality and reliability. We are excited to continue growing alongside our airline customers while enhancing our ability to meet their evolving maintenance needs," said John M. Holmes, AAR's Chairman, President and CEO. "We appreciate the collaboration of Miami International Airport, our project partners, and government stakeholders whose support made this expansion possible."



CFM56 TO LEAP: THE NEXT PHASE OF THE CFM AFTERMARKET

MRO X Research examines how sustained CFM56 overhaul demand and the emerging LEAP maintenance cycle are reshaping the single-aisle engine MRO market. The narrowbody engine aftermarket is entering a two-generation cycle. The CFM56 aftermarket continues to show resilience in 2026. GE Aerospace expects CFM56 retirement rates at only 1.5–2% this year, below its earlier expectations, while annual shop visits are now expected to reach approximately 2,300–2,400 in 2026-27. GE also estimates that around 30% of the fleet has yet to undergo its first shop visit, while roughly two-thirds have not reached a second visit, indicating that significant overhaul demand remains ahead.

Material availability is becoming the key challenge

The market is increasingly shifting from an MRO-capacity problem to a parts-availability problem. Shortages of critical CFM56 components, particularly high-pressure turbine blades, are affecting overhaul turnaround times and increasing the importance of USM, component repair and engine exchanges. Low aircraft retirement rates are also limiting the flow of used material into the aftermarket.

MRO providers are moving deeper into the CFM56 aftermarket

MRO companies are expanding beyond complete engine overhauls into module repair, piece-part capability and component services. The GMF AeroAsia–FTAI collaboration announced in September is one example, with the partners targeting CFM56-5B and -7B maintenance and planning to expand into deeper module and piece-part capabilities. This reflects the industry's growing focus on extracting more value from every engine and component.

LEAP is building the next aftermarket wave

While CFM56 remains a major source of MRO activity, the LEAP aftermarket is rapidly developing in parallel. CFM says more than 10,000 LEAP engines have already been delivered, making it the fastest ramp-up of a commercial engine programme. GE expects the LEAP installed base to more than double between 2025 and 2030 and exceed the CFM56 installed base by the end of the decade.

LEAP MRO capacity is expanding ahead of demand

CFM and its partners are investing heavily to prepare for the coming LEAP shop-visit cycle. In 2026, MTU Maintenance Fort Worth became a new LEAP Premier MRO, while Iberia and SSAMC Chengdu are also joining the global network. CFM says GE and Safran have committed more than $1 billion and €1 billion respectively over five years to expand LEAP aftermarket capability.

Durability upgrades could reshape LEAP maintenance

LEAP's aftermarket is also being influenced by improvements designed to increase time-on-wing. GE completed certification of the LEAP-1B durability kit, including an upgraded HPT blade, which is expected to approximately double time-on-wing for the engine. GE also reports that 40% of the LEAP-1A fleet has the durability kit installed and 70% has the reverse bleed system.

India is emerging as an important LEAP MRO market

India is becoming strategically important for the next generation of CFM engine support. In July, IndiGo and CFM signed an MoU covering more than 1,000 LEAP-1A engines for 510 A320neo-family aircraft, together with support for IndiGo's planned engine MRO facility and long-term material services. CFM says five Indian airlines already operate more than 400 LEAP-powered aircraft, with approximately 2,000 engines on order.

MRO X View: Two generations, one aftermarket

The CFM56 and LEAP are now creating an unusual situation for the MRO industry: two generations of CFM engines are generating demand at the same time. CFM56 remains supported by a large mature fleet and low retirement rates, while LEAP is building a rapidly expanding installed base that will generate substantially greater shop-visit requirements later this decade. IATA estimates annual LEAP shop visits could rise from approximately 600–800 in 2025 to more than 5,000 by 2040.

For MRO providers, the opportunity is therefore not simply about replacing CFM56 with LEAP. The industry must support both engines simultaneously maximising the remaining life of the CFM56 while building the capacity, skills, parts ecosystem and repair capabilities required for the LEAP aftermarket.



CFM56 AFTERMARKET REMAINS RESILIENT AS OPERATORS EXTEND FLEET LIFECYCLES

The CFM56 installed base remains large and highly utilized in 2026, with many A320ceo and 737NG aircraft staying in service longer than expected. MROX learnt that around two-thirds of the fleet is still scheduled for at least one shop visit, supporting strong overhaul demand. Key drivers include engine maturity, high utilization and the need to extend asset life through performance restoration and LLP replacement. CFM56 overhaul turnaround times have largely stabilized, although engine condition and workscope remain important variables. Material and repair availability are now major TAT drivers, with teardown findings and shortages of high-demand parts often adding time to shop visits. Here are the details …..


Gaël Méheust

How would you describe the current CFM56 overhaul market in 2026?

Olivier Ruffet, Vice President - Sales, EMEA, StandardAero - Year to date, the CFM56-5B/7B overhaul market has remained strong, reflecting the continued popularity of the Airbus A320ceo and Boeing 737NG platforms. There are a number of headwinds facing operators, not least the rise in Jet A costs, with some economic indicators now also tracking negatively.

Gaël Méheust, President & CEO, CFM International - The CFM56 installed base remains large, with high utilization in 2026. We see many aircraft staying in service longer than originally expected, and about two-thirds of the fleet is still scheduled for one or more shop visits. Our focus is on helping customers keep those fleets flying with a broad portfolio of new parts, repairs, and used serviceable material (USM).

Virgil D. Pizer, Chief Executive Officer, PEM-AIR Turbine Engine Services - The CFM56 overhaul market remains one of the busiest and most resilient segments of the commercial engine aftermarket. While industry attention is often focused on next-generation engines and their durability challenges, thousands of CFM56-powered aircraft continue to operate worldwide, sustaining strong demand for MRO services.

In 2026, key themes remain shop visit capacity, material availability, and cost control. Operators are planning maintenance events further in advance and placing greater emphasis on extending on-wing time wherever possible. Access to used serviceable material (USM) and effective engine asset management continue to play an important role in managing overhaul costs and minimizing downtime.

For freighter operators, the market benefits from the scale of the passenger fleet, which supports a mature global network of MRO providers, repair capabilities, and spare parts availability. Although freighters represent a smaller share of the installed base, the CFM56 remains one of the most supportable and economically viable engine platforms in commercial aviation.

Tay Eng Guan, Head of Engine Services, ST Engineering - The CFM56 overhaul market remains more resilient than many expected. While the engine is a mature platform and newer LEAP engines offer better fuel efficiency and technology, demand for CFM56 MRO has not tapered off in line with the expected fleet transition. Our demand outlook continues to point to a strong CFM56 shop visit pipeline through 2028, 2029 and beyond.

This is largely because airlines are keeping CFM56-powered aircraft in service for longer. Persistent supply chain constraints have affected new aircraft and LEAP engine deliveries, while GTF engine quality issues have further tightened aircraft availability. At the same time, air travel demand has not only recovered from the pandemic but exceeded pre-Covid levels in many markets. The result is that operators are delaying retirements and relying on their existing CFM56 fleets to maintain capacity.

Roy de Vries, Director Engines Product, Network and Industrial Development at Air France Industries KLM Engineering & Maintenance - MRO demand for CFM56 will remain strong, particularly for the CFM56-5B and CFM56-7B engines. Newer aircraft like the 737 MAX and A320neo, using CFM LEAP and P&W GTF are facing lead time and region-related durability issues and are working on further maturing. This makes operating CFM56 powered narrow bodies aircraft longer, a potentially attractive option.

The MRO market will see high demand for spare parts, shop visits, engine overhauls, particularly for -5B and -7B variants as the B737NG and A320 family classic are the Narrow body working horse for the near future.



The secondary market for used engines and parts will be highly active as airlines optimize costs. This increases pricing of used engines and puts pressure on the availability of used engines



and used serviceable material.

The ongoing supply chain constraints in parts manufacturing, logistics, and labor shortages, are impacting turnaround times for MRO services, affecting total cost of operation and the need for spare engines.

A robust aftermarket for used CFM56 engines and modules will continue, and the rise of freighter conversions for A320 and 737NG aircraft will extend the demand for CFM56 engines further in the future.

What are the primary factors currently driving CFM56 shop visits?

Olivier Ruffet - We're seeing a broad range of shop visit drivers: on the one hand we are continuing to see strong demand for overhauls from operators who expect to continue operating the CFM56-5B/7B deep into the next decade. At the same time, we are also seeing demand for specialized workscopes such as exchanges and specific 'cycle remaining' builds from customers with earlier aircraft retirement dates who wish to avoid over-investing in their engines.

Gaël Méheust - The main drivers are the size of the installed fleet, high utilization, and the fact that airlines are keeping CFM56-powered aircraft in service longer than originally expected. Passenger demand remains strong, and there is also growing interest in CFM56-powered freighters; there are currently more than 400 such aircraft powered by CFM56 engines. We're happy to work with customers through the cargo conversion process as part of supporting the fleet over the long term.

Virgil D. Pizer - The primary drivers of


Olivier Ruffet

CFM56 shop visits in 2026 are engine maturity, utilization levels, and the need to maximize asset life. Many engines have accumulated substantial cycles and flight hours, making performance restoration and LLP replacement increasingly necessary as fleets age.

For freighter operators, maintenance requirements are often driven more by cycles than hours. Cargo networks typically involve frequent takeoffs and landings, which can accelerate wear on key engine components. Monitoring EGT margin, fuel burn, and reliability trends is therefore essential to optimizing on-wing time.

Maintenance planning is also a key consideration. With overhaul costs remaining elevated, operators are carefully balancing shop visit scope, remaining engine life, and aircraft utilization to achieve the most economical outcome for their assets.



Tay Eng Guan - Operators are planning CFM56 shop visits around three broad priorities: extending the useful life of younger engines, managing the transition to new-generation aircraft, and maximising asset value.

For operators with relatively young CFM56 fleets, the focus is typically on performance restoration and LLP refreshes that can support longer time-on-wing. This often includes deeper work on the HPC and HPT, higher-life LLPs and selected modifications to improve engine performance and extend operating life.

For operators preparing to retire CFM56-powered aircraft or transition to LEAP or GTF platforms, the objective is different: minimise shop visit cost while retaining enough engine life to bridge the transition. In these cases, operators may consolidate fleets, assess engines that are beyond economic repair, and use green-time LLPs, module swaps or targeted work scopes to keep aircraft flying until exit.

For lessors and asset managers, the focus is on extracting the highest economic value from the engine portfolio. That can mean matching LLP life across engines, creating modules for future swaps, or moving parts between assets to optimise residual value and marketability.

Roy de Vries - A large, A320 FAM and B737NG aging fleet flown harder and kept longer, in relation with A320neo/ B377 MAX and supply-chain constraints, plus freighter growth and a tight aftermarket, including scarcity of USM.

- Huge, still-active fleet base – CFM56 remains the dominant in-service narrowbody engine family (20k+ engines in service; 600+ operators, 34k+ delivered), so even "normal" shop-visit rates translate into high absolute volumes.


Virgil D. Pizer

- Aging engines hitting life-limits – Heavy shop visits for CFM56 are peaking around 2025 as time-on-wing/ LLP thresholds are reached across the -5B/-7B fleets.
- New-aircraft/engine delivery delays – Supply-chain bottlenecks and slower-than-planned narrowbody deliveries force airlines to keep A320ceo/737NG aircraft in service longer, driving additional overhauls.
- GTF (PW1100G) disruptions shifting flying to ceos – Neo groundings and availability issues have kept more A320ceos (CFM56-5B) active and flying harder, increasing shop visits.
- Freighter growth (esp. 737-800BCF) – Rising 737NG freighter conversions/ utilization sustain demand for CFM56-7B maintenance.
- Tight USM (CFM56 HPT Blades) & shop capacity – Scarce used serviceable material and long MRO backlogs push operators toward more (and deeper) visits, sustaining high demand.
- High engine values & limited "green-time" – Elevated CFM56 lease/asset values and fewer cheap swap options drive owners to repair rather than replace.

As CFM56 fleets continue to age, what are the biggest technical challenges MRO providers are encountering during overhaul?

Olivier Ruffet - Material supply challenges probably remain the biggest technical challenge, due to the continued fragility of the supply chain and the significant demand being placed on it as the aircraft OEMs seek to ramp-up production rates. These challenges include both parts supply and repair turn around times (TATs), though we are continuing to see gradual improvements in both.

Gaël Méheust - A key focus is keeping pace with demand while continuing to modernize how critical parts are produced and repaired. In Greenville, South Carolina, for example, we've more than doubled CFM56 HPT blade production capacity since 2024. To date, we have shipped more than 3,000 sets of our newest, most durable CFM56 HPT blades. Earlier this year, we announced a $33 million investment in the Greenville facility, about half of which will go to upgrade the line that produces CFM56 HPT blades to newer manufacturing technologies. In Singapore, we announced a multi-year investment plan of up to $300 million through 2029 to expand repair capability with more advanced automation, digitization, and AI-enabled inspection.



Virgil D. Pizer - As CFM56 fleets continue to age, one of the biggest challenges during overhaul is managing engine variability. Two engines with similar time and cycle counts can require very different workscopes depending on their operating history, maintenance records, and previous repairs.

For freighter operators, many of whom rely on mature aircraft and engines, maintaining cost-effective repair solutions has become increasingly important. MRO providers are seeing more components that have already undergone multiple repair cycles, requiring careful evaluation to determine whether parts can be repaired again, replaced with serviceable material, or retired from service.

For smaller cargo carriers in particular, cost predictability and aircraft availability are often critical considerations.

Unexpected findings during teardown can quickly affect maintenance budgets and operational schedules. As a result, thorough pre-shop visit planning, realistic engine assessments, and access to quality used serviceable material are becoming increasingly important for controlling costs while maintaining reliability.

Tay Eng Guan - As the CFM56 fleet is considered a matured platform; in terms of technical challenges we do not expect MRO providers to encounter any unforeseen reliability issues that was not been previously identified and addressed through Service Bulletins. Most of the issues that we expect will likely be from supply chain issues arising from any ongoing geopolitical situations.

Roy de Vries - HPT hardware and hot-section deterioration - HPT blades are exposed to very high thermal and mechanical loads, so MROs increasingly encounter accumulated coating degradation, airfoil distress, dimensional deterioration and cracking.

Crack detection in high-cycle/low-cycle fatigue areas - Aging increases the importance of finding defects that are not visible during conventional visual or fluorescent-penetrant inspection. The CFM56-7B fan-blade experience is a good example: investigations found fatigue cracks in blade dovetails that could escape conventional inspection, leading to adoption of eddy-current and ultrasonic techniques.

Combustor and hot-case distress - Older engines can arrive with significant accumulated combustor distress—liner cracking, burn-through, TBC deterioration, support damage, erosion and dimensional changes. The CFM56-7B maintenance guidance, for example, calls for close inspection of liners, supports and TBC and includes durability modifications intended to address recurring distress.

Rotor, disk and LLP life management - Life-limited parts (LLPs)—disks, spools and shafts—are much less forgiving than repairable hardware. With engines having passed through multiple operators and numerous shop visits, reconciling module build records, LLP histories, cycle counts and configuration changes can become a major engineering task.

What is the current trend in CFM56 overhaul turnaround times, and what are the biggest factors affecting TAT?

Olivier Ruffet - While overhaul TATs remain higher than pre-2020 levels due to the aforementioned supply chain challenges (and the current level of demand), they have stabilized over the past couple of years as MRO providers have to some degree been able to adapt to the 'new norm.'


Tay Eng Guan

Gaël Méheust - We're making progress by increasing repair throughput and continuing to ramp material support where it matters most. In Singapore, repair processes using additive manufacturing reduce turnaround times by around a third.

Virgil D. Pizer - Turnaround times for CFM56 overhauls have generally stabilized compared to the peak disruptions seen in recent years, although they still vary considerably depending on engine condition and workscope requirements.

Today, the biggest drivers of TAT are often related to material and repair availability rather than shop capacity alone. Older engines frequently present findings during teardown that require additional repairs or replacement components, and sourcing certain high-demand parts can still add time to the process. The condition of the engine at induction also plays a significant role in determining how predictably a shop visit progresses.

For many small and mid-size freighter operators, access to replacement material can be particularly important. While OEM-supplied parts remain a key part of the support ecosystem, operators are increasingly considering alternatives such as quality used serviceable material (USM) and, where approved and appropriate, PMA solutions to help manage maintenance costs and support overhaul schedules. Advance planning and a flexible material strategy remain essential for maintaining fleet availability and reducing maintenance uncertainty.

Tay Eng Guan - CFM56 overhaul turnaround times are generally in the 90- to 120-day range, although this varies depending on the work scope and parts availability. Persistent post-Covid supply chain constraints continue to be the main pressure point. They have affected not only the availability of new replacement parts, but also repair turnaround times where materials or component repair capacity are constrained.

Used serviceable material can help mitigate some shortages, but only to a limited extent given cycle-matching and certification requirements. We expect these constraints to remain a key driver of CFM56 TAT through the remaining lifecycle of the engine.

Roy de Vries - Shop-floor capacity is less often the limiting factor than parts availability—especially HPT blades. The



CFM56 supply conditions could start improving toward late 2026 or early 2027, although it expects a lag before increased production works its way through the supply chain. CFM56 TAT problem has shifted from MRO capacity shortage toward a more concentrated critical-material availability, and an aging-hardware disposition situation.

How have shortages of skilled technicians, component repair capacity, testing capacity, and supply-chain disruptions affected CFM56 shop visits?

Olivier Ruffet - Of these four factors, component repair capacity and supply-chain disruptions stand out as key drivers. Thanks to our two CFM56 engine test locations (in Winnipeg and Dallas) StandardAero itself hasn't seen any disruption from testing capacity, and our alliances with local technical colleges (plus our in-house training academy) continue to provide a reliable flow of skilled technicians.

Gaël Méheust - Our focus is on the actions we are taking to support customers: increasing throughput, ramping material and repair support, and continuing to invest in the CFM56 fleet. That includes advanced repair capability in Singapore, where additive processes can double the number of parts repaired daily, and continued HPT blade ramp-up in Greenville to help meet demand.

Virgil D. Pizer - The impact on CFM56 shop visits has been similar to that seen across the broader engine MRO industry. While labor availability, repair capacity, and supply-chain challenges created significant pressure in recent years, conditions have gradually improved. Today, turnaround times are more often driven by individual workscope requirements and the availability of specific parts or repairs than by systemic capacity constraints. For


Roy de Vries

operators, proactive planning remains the best way to minimize disruption and keep maintenance schedules on track.

Tay Eng Guan - These constraints do not reduce demand for CFM56 shop visits, but they do place pressure on effective MRO capacity and can make turnaround times less predictable. Material availability, skilled labour shortages and repair bottlenecks all affect how quickly engines can move through the shop.

To address this, we have implemented robotics, automation and AI-enabled solutions on our shopfloor to improve productivity and consistency across the engine MRO process. These include AI-powered visual inspection to automate initial engine checks and reduce manual photo-taking, machine-learning tools to identify and sort engine hardware more efficiently, and robotics-enabled processes for tasks such as fan frame abradable seal removal, underwater polishing and metallurgy testing. Together, these technologies reduce repetitive manual work, improve precision and allow our technicians to focus on higher-value tasks.

Roy de Vries - The impact has been significant, however, the bottleneck has changed over time. For CFM56 shop visits, labor and repair capacity were major constraints during last years.

By 2026, critical-part availability—particularly HPT blades—has become the dominant constraint; while testing and specialist repair capacity remain important regional bottlenecks.

Will growing LEAP MRO investment come at the expense of CFM56 repair capability?

Olivier Ruffet - While the market is seeing strong demand for additional LEAP repair development (demand which is in part being served by our own Component Repair Services (CRS) division), the shear number of existing CFM56 shops (and the size of the existing CFM56 repair catalog) will hopefully avoid any significant impact on CFM56-5B/7B operators.

Gaël Méheust - CFM56 remains a very important fleet for us, and we continue to invest accordingly. We continue to expand repair capability, including 400+ new CFM56 repair industrializations since 2023. Those are concrete examples of ongoing investment to support customers operating CFM56 fleets for years to come.

Virgil D. Pizer - In the long term, these factors are likely to have some impact on the CFM56 maintenance market. However, the platform benefits from a large installed base, a well-established repair network, and extensive industry experience. The greater challenge is not whether support will remain available, but how the market evolves over time. At this stage, predicting the duration and pace of that transition remains difficult.

Tay Eng Guan - No. Investing in LEAP MRO capability does not mean stepping away from CFM56. There remains a large installed base of CFM56-powered aircraft, and many operators will continue to rely on these engines well into the next decade as they manage fleet renewal, delivery delays and capacity requirements.

Our approach is to support both platforms in parallel. We are adding capacity and investing in productivity improvements so that we can continue serving customers operating CFM56 fleets, while building the capabilities needed for the growing LEAP fleet. The transition will not happen overnight, and we remain fully committed to helping customers who still depend on CFM56 as they prepare for the next generation of engines.



Roy de Vries - We expect that the industry will develop a two-tier model: expanding LEAP capacity while concentrating CFM56 expertise in fewer, higher-utilization shops.

The CFM56 fleet is still large and will remain in service for many years. CFM itself continues to expand the aftermarket ecosystem rather than abandoning the engine.

Are you seeing greater reliance on USM, repaired material, PMA or DER-approved repairs as CFM56 engines move deeper into their lifecycle?

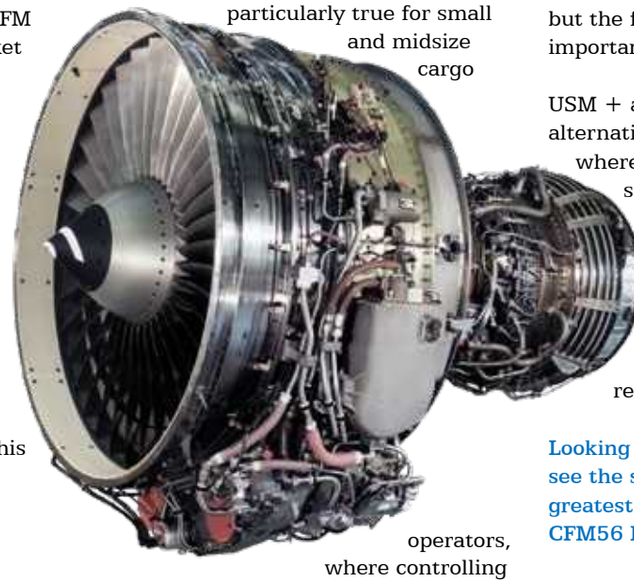
Olivier Ruffet - We are certainly seeing more interest in used serviceable material (USM) and green-time engines, and while the supply of such material has been constrained in recent years due to the low level of A320ceo and 737NG retirements, we do expect this situation to ease over the coming years, further driving demand.

Gaël Méheust - At this stage in the lifecycle, increased utilization of USM and repaired material is by design. USM can cost about 30% less than new, and repaired material can cost less than 50% of a replacement part. CFM's industrialization of over 400 new repairs in the past three years demonstrates our commitment to reducing cost of ownership in all phases of the lifecycle.

As our customers adopt the latest generation of aircraft, we anticipate an eventual increase in retirements, supporting USM supply as well as contributing to conversion feedstock. With increased supply of USM, we believe that customers

CFM Footer 2 will rely primarily on OEM material solutions in order to preserve maximum asset value and re-marketability.

Virgil D. Pizer - Yes. As CFM56 engines move deeper into their lifecycle, operators are increasingly relying on a combination of USM, repaired material, and approved alternative solutions to support maintenance requirements. This is particularly true for small and midsize cargo



operators, where controlling maintenance costs while maintaining fleet availability is a critical objective.

Many freighter aircraft are operating in a second phase of life after years of passenger service, so the economics of a shop visit often depend on maximizing the value of existing assets. In that environment, USM and repair solutions can provide significant benefits by reducing costs and preserving availability without compromising reliability or regulatory compliance.

Rather than being viewed as alternatives to traditional maintenance, these solutions have become an integral part of the support strategy for mature CFM56 fleets. As long as the platform remains in widespread service, we expect demand for quality USM, repairs, and other approved maintenance solutions to remain strong.

Roy de Vries - From our perspective, we see the CFM56 engines move deeper into the lifecycle, there is clearly greater reliance on USM and repaired material, and increasing use of PMA and DER-approved repair solutions—but the four categories are not equally important.

The strongest shift is toward USM + approved repairs, with PMA/DER alternatives becoming increasingly useful where OEM material is expensive, scarce, or has long lead times.

USM big increase, OEM/licensed repaired material, significant, PMA selective growth

DER-approved repairs growing, in difficult-to-source repairs but still restricted by lessors

Looking ahead to 2030, where do you see the strongest opportunities and the greatest risks for companies specializing in CFM56 MRO?

Olivier Ruffet - Safran itself expects CFM56 shop visit demand to begin sunsetting from 2029, and while the size of the current active fleet (12,000 engines) makes it unlikely that this will be a sudden fall in activity, we can expect to see further interest in alternative support offerings – including exchange engines, green-time engines, part-life build engines and PMA/DER – as operators seek to avoid over-investing in their CFM56s.

Gaël Méheust - Looking ahead, we see continued opportunity in serving a diverse CFM56 customer base across passenger, cargo, leasing, and other missions, which is why we offer a broad portfolio of support solutions – and a competitive aftermarket through our open MRO ecosystem. That is why CFM renewed its agreement with IATA, signed a multi-year agreement with FTAI to provide



component and repair support for CFM56 engines, and partnered with Willis Lease Finance Corporation (WLFC) on a program to help extend the operational life of CFM56-5B and -7B engines. Those actions reflect our commitment to helping keep the fleet flying and supporting customers with practical, competitive solutions.

Virgil D. Pizer - Looking toward to 2030 and beyond, our focus is less on predicting exactly how the CFM56 market will evolve and more on ensuring we continue to support our customers wherever the demand exists. As long as there is a viable market and a sound business case for both operators and Pem-Air, we expect the CFM56 to remain an important part of our portfolio.

At the same time, it is important for MRO providers to continually adapt. The industry is constantly evolving, and it is rarely wise to remain stagnant or overly dependent on a single platform. As customer needs change, service offerings must evolve alongside them.

At Pem-Air, we have already expanded our capabilities to include the LEAP engine as the natural successor to the CFM56. Exactly how quickly that transition occurs remains to be seen, but maintaining a balanced portfolio and supporting customers across multiple engine platforms will be key to long-term success.

Tay Eng Guan - CFM56 MRO demand will not disappear after 2030, although it will gradually decline as more operators transition to new-generation aircraft and engines. The opportunity lies in supporting customers through this extended tail of demand, particularly where CFM56-powered aircraft remain critical to fleet capacity or where operators need cost-effective work scopes to bridge their transition plans.

The key risk is timing the economic tipping point correctly. As the fleet ages, there may come a stage where sourcing a serviceable used engine is more economical than putting an engine through a full overhaul. MRO providers will need to manage this transition carefully, with disciplined capacity planning, materials strategy and inventory management to avoid being caught with excess parts or capabilities beyond what the market can absorb. Our engine MRO facilities in Xiamen, China and Singapore are well-positioned with sufficient capacity to handle strong demand from CFM56 shop visits.

Roy de Vries - Looking toward 2030, we see a specialized CFM56 MRO—but with note, the opportunity is shifting from conventional engine overhaul capacity toward scarce technical capabilities, material access and lifecycle management.

The CFM56 is not disappearing by 2030. More than 20.000 CFM56-5B/-7B engines are in operation, many need MRO, rather than an abrupt retirement

Meet with us: **MRO Europe,** 28-29 October, Amsterdam # 1-543

