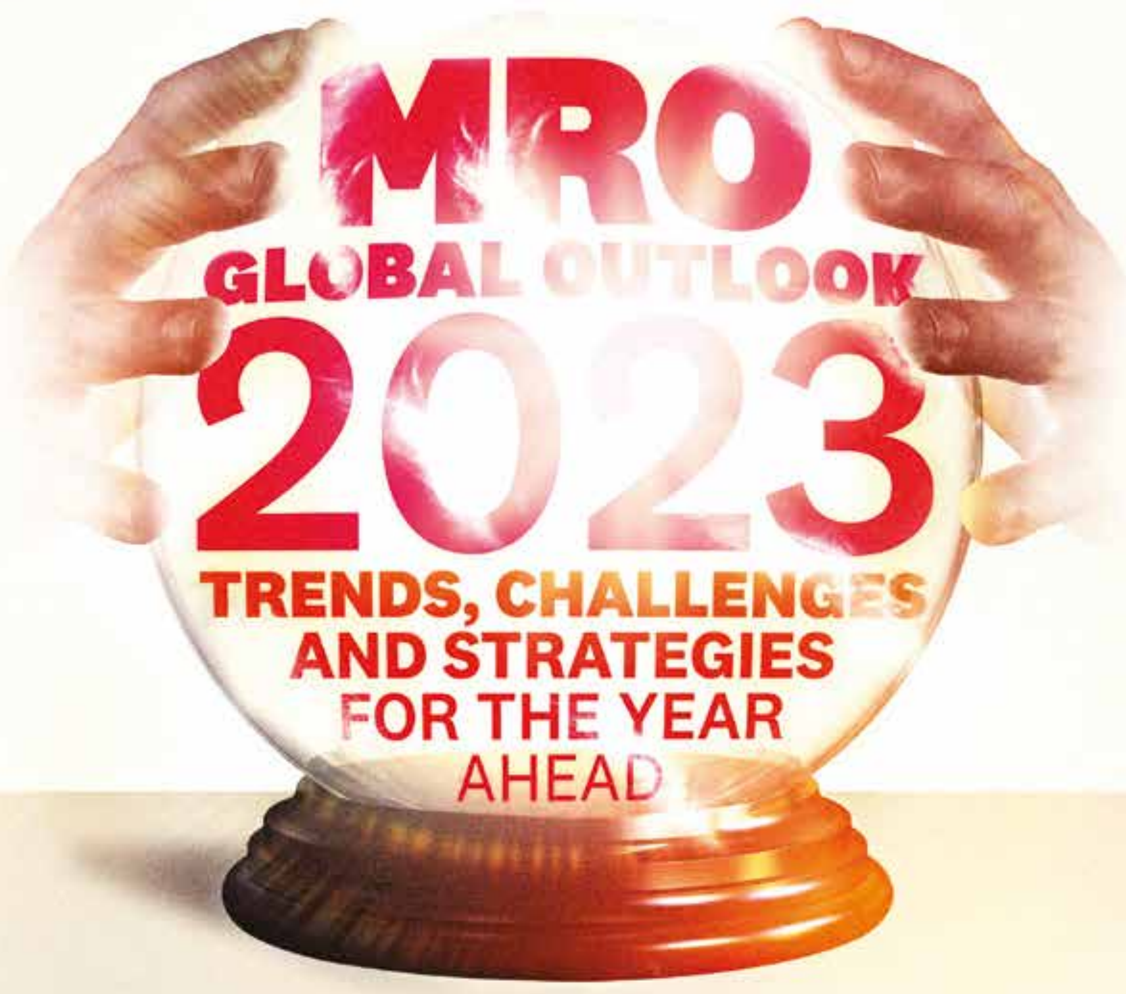
aviationbusinessnews.com
NOVEMBER/DECEMBER 2022 • VOLUME 24 • ISSUE 8

Keeping the world's fleets flying

MRO Management



GET SMART
How intelligent spare parts inventory management makes a big difference

INDUSTRY VOICES
A timely launch, a painting partnership and a well-kept secret

THE POWER OF DATA
In review: The Predictive Aircraft Maintenance 2022 conference

GLOBAL MARKET OUTLOOK 2023

MAXIMISING MOMENTUM

Labour shortages, supply chain disruptions and economic headwinds will continue to present the MRO industry with significant challenges in 2023, but there are nevertheless plenty of reasons to be optimistic. **Jason Holland** spoke to a range of companies to see how they are planning to build on the positive momentum the industry generated in 2022

"I think 2023 will be an outstanding year for our industry, despite the persisting global challenges," says Lufthansa Technik's David Doyle. Across all MRO segments, many of the company's shops "are almost fully booked so that we even had to turn down first customer requests", reports the vice president of corporate strategy, innovation management & product development at the Hamburg, Germany-headquartered MRO.

This positivity is echoed at ST Engineering. "Thanks to widespread dissemination of vaccines, re-opened borders and pent-up demand for travel, flying and MRO activities have been steadily recovering, and I believe we will continue to enjoy that momentum across all segments of MRO in 2023," comments Jeffrey Lam, president of commercial aerospace at the Singapore-headquartered company.

"However, it remains to be seen how quickly we can get back to the 2019 pre-pandemic level of activity given all the uncertainty that is in the current global economic climate, and how soon major markets such as China relax their Covid measures and fully re-open their borders."

Richard Kendall, chief commercial officer at Hong Kong-headquartered HAECO Group, says factors such as these have led to regional variations in MRO recovery, which will persist into 2023. "While every country was affected by Covid to a great extent in the first 12-18 months [of the crisis], in the past six months we have seen more regional variation in terms of impact on air travel and hence in terms of MRO demand from the airlines in those particular regions," he reports.

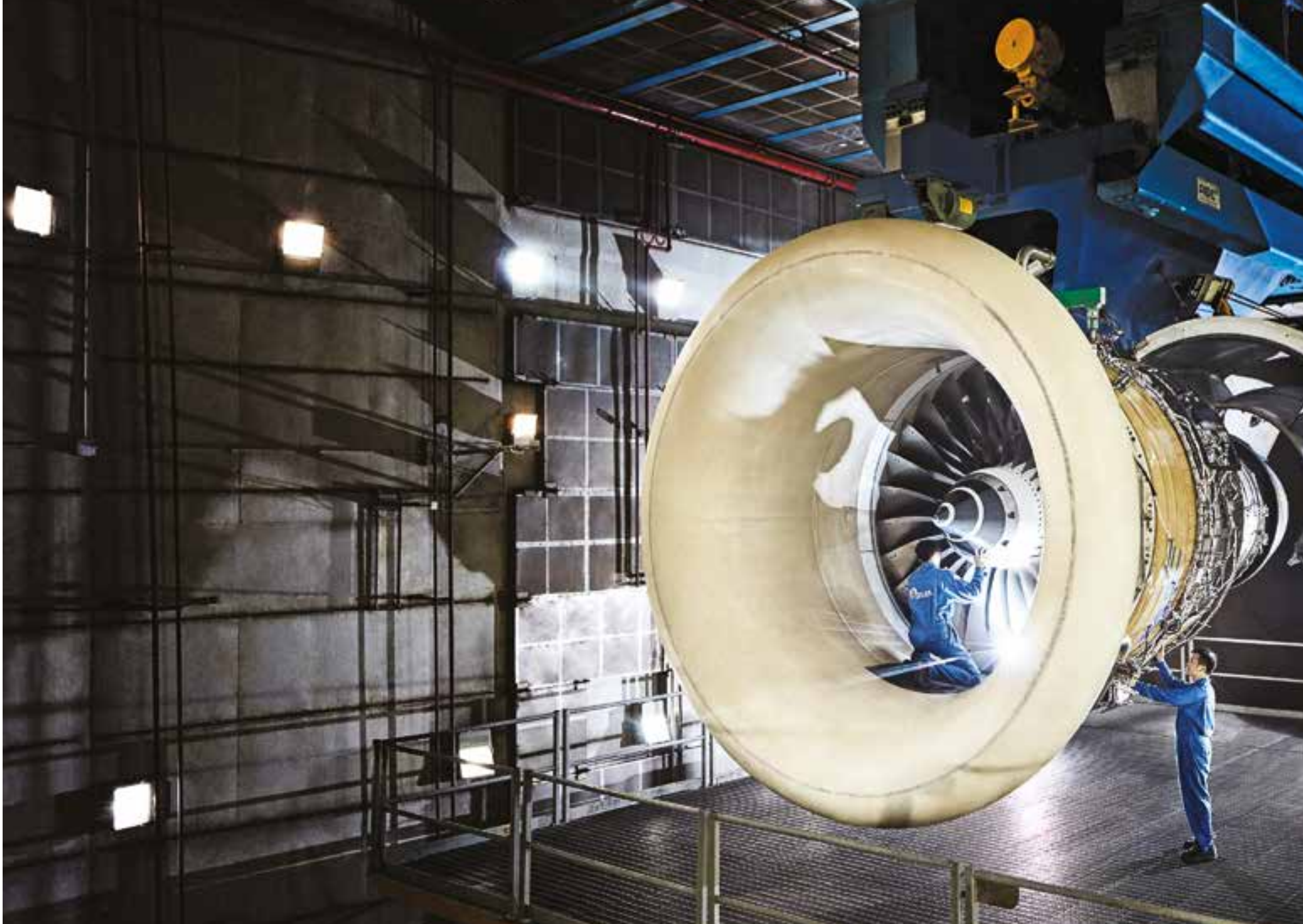
"While narrowbody traffic in, say, Europe and domestically in the US, and at times domestically in Mainland China, came back relatively early, from there regional differences emerged. Chinese lockdowns have disrupted regional air travel within China, for example."

The overall picture is promising, according to Lewis Prebble, president of the airlines and fleets division at Arizona, US-headquartered StandardAero. "I believe there remains a lot of opportunity in the industry, despite the headwinds faced on a number of fronts," he says.

"2022 saw a continued recovery in passenger traffic, aircraft orders and MRO demand and, while some observers are now projecting a one-year slip in the date for a full recovery to pre-Covid levels of traffic, there is at this stage no indication that a full recovery won't be attained."

Louis Philippe Mallette, senior vice president operations at Montreal, Canada-headquartered AJW Technique, the maintenance hub for the AJW Group's component MRO service, notes that the aviation industry continues to face immense challenges. "Even though the effects of the pandemic are essentially now in the background, they can still be felt in terms of labour shortages, supply chain fracture, spare part availability and lead times, and the ongoing conflict in Russia and Ukraine. Even though these and a downturn in travel due to a falling economy appear to be a melting pot for the deterioration of the MRO and aftermarket sectors, there is still strength in commercial aircraft maintenance, and we are confident of further recovery in MRO services going into 2023," he says.

Mallette cites a recent quarterly MRO survey which indicated that MRO sales were up across the industry, and are, in fact, the strongest they have been over the past year. "These results are led by MRO sales and strength in Europe and Asia, which is interesting considering the political unrest



1

"I believe there remains a lot of opportunity in the industry, despite the headwinds faced on a number of fronts"

in the region and the looming economic crisis," he comments.

Availability of spare parts, lack of raw materials, and lead times due to a reduced workforce remain a significant risk to MRO recovery, Mallette adds, but he thinks "things look set to improve in the coming year as ageing fleets, spare part inventory levels and a delay in new aircraft deliveries have airlines turning to MRO services. Increases in material pricing are also a key factor affecting growth as the continued rise in pricing creates a favourable environment for investors as the industry gains strength."

Many MROs are reporting strong health, largely due to the recovery coming back much quicker than many analysts predicted, says Fraser Currie, CEO of Jordan-headquartered MRO company Joramco. His company posted record revenues and net profit in 2021, and 2022 will surpass even these marks, he reports.

The MRO landscape has been affected, with there now being a "huge demand from airlines for long-term contracts", he notes. "There's a huge capacity shortage in the market, especially in the US, which doesn't have the seasonality that we have." Joramco's seasonality has reduced in recent times though, and it is now almost as busy in the summer as it is in the winter.

"A lesson from that is we're going to have to evolve staffing policies in terms of training and leave, because we traditionally would have leave in the summer, train in the summer and get ready for winter. We're currently able to do that, but forecasting into 2023 and 2024 it's no longer the case and we're going to have to adopt similar models to the US."

David Doherty, head of commercial at Abu Dhabi-headquartered Etihad Engineering, also sees contract demand shifting. "We are seeing many airlines looking to undertake fleet refurbishment projects which had previously been put on hold, with slot availability becoming a challenge, which means that many operators are looking to secure long term maintenance deals with their preferred providers over three or four years," he says.

Lufthansa Technik's Doyle was pleasantly surprised by the faster-than-expected rate of recovery. "After we quickly returned to the black in 2021, we now even see us on track for a record result for 2022, having just reported the best ever quarter in our company's financial history. I expect this positive development to stay that strong across all MRO products," he says.

Sector trends

As well as regional variations, there are also differences in the outlook for 2023 by MRO segment. "A couple of patterns have emerged," explains HAECO's Kendall. "Narrowbody MRO rebounded much earlier than the widebody sector, and that's a culmination of bringing aircraft out of storage, and those aircraft that were continuing to operate throughout the pandemic coming up to their regular cyclical maintenance checks. Our sizeable airframe services business in the US rebounded much earlier in terms of volume than our Asian facilities, for example."

2

A lot of HAECO's "bread and butter" is widebody aircraft maintenance at its airframe facilities in Hong Kong and Mainland China, says Kendall, but despite the slow rebound in this sector the company has "actually had quite strong demand for maintenance in 2022". He adds: "Many of our customers are internationally based, and we generate more than half of our business from the US, and about a quarter from Europe."

Edwin Poldermans, director of operations at Netherlands-headquartered independent aviation aftermarket company Fokker Services Group, reports that the demand for widebody maintenance in the EMEA market has increased substantially. Due to lockdowns, a lot of capacity in Asia Pacific is no longer available, while there has also been some uncertainty on future border closings.

"This is the reason we forecasted growth opportunities in this widebody segment and this year, we invested in our widebody capabilities by building a new widebody hangar at our location in Woensdrecht in the south of the Netherlands," he says. "In this new hanger we will be able to provide full Airbus A330 base maintenance, while looking at Boeing 777s in the near future."

While there is usually a lag between the airframe and engine markets, the global engine MRO market has also rebounded in 2022. Lufthansa Technik's Doyle says that "green time reserves have largely dried up so that even costly overhauls are really gaining momentum again".

CFM International is still expecting engine MRO activity to grow as the Covid recovery continues. "We see spare parts volume continuing to increase based on the higher MRO demand year-over-year, and internal shop visits continuing to grow as well," states a spokesperson for the Ohio, US-headquartered 50/50 joint venture between GE Aviation and Safran Aircraft Engines.

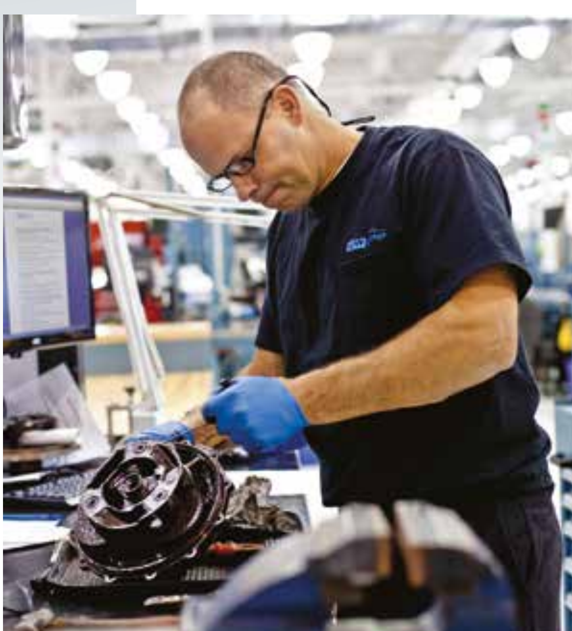
Pratt & Whitney, the Connecticut, US-headquartered engine manufacturer, has positioned itself to "power the segments recovering most quickly", according to Kevin Kirkpatrick, its vice president, aftermarket global operations. "These include GTF and V2500 engines on single-aisle aircraft and PW4000-powered freighters," he says.

"GTF-powered aircraft are especially well positioned for growth – not only for domestic operation, but also for the longer routes made possible by A321neo, A321LR and soon A321XLR aircraft. In certain cases, these aircraft are replacing widebodies. We are seeing an increase in demand for both our Pratt & Whitney GTF engines and mature commercial engines. We are ramping our shop visit volumes to accommodate this demand and working with customers to align shop visit planning with availability."

Jan Kotka, chief operating officer at Tallinn, Estonia-headquartered Magnetic MRO, thinks engine repairs of CFM56-5B/7B engines will continue as they are in 2023 "or become even bigger". He believes engine leasing will recover as well "as more and more engines go for scheduled repairs that will last longer than pre-Covid due to problems with longer material repair turnaround times".

Iberia Maintenance expects that engine MRO volumes will be strong in 2023, based on its already committed workload. The Madrid, Spain-headquartered MRO company's commercial & business development director Marc Wittingen says there is "a continuous trend on multiple engine models to tailor workscopes".

1. HAECO is seeing the engine MRO segment rebound after a drop in volumes in 2021
2. Lufthansa Technik's David Doyle sees a bright future for predictive analytics
3. There has been an upturn in productivity at AJW Technique Europe in 2022



3

1

1. MRO providers will need to become increasingly specialised and digitally efficient to maximise available resources and capture maximum market share, says Magnetic MRO's COO Jan Kotka (**2**)

"By far the biggest challenge our industry needs to overcome is producing sufficient personnel to meet growing demand"

He adds: "Shop visits are looked upon as investments these days and this results in more and more partial or modular workscopes. Additionally, supply chain performance will to a certain extent limit the amount of volume that shops worldwide can handle. Repair capacity is still not back to pre-Covid levels and the expectation is that 2023 will be another challenging year. The supply of new parts will also continue to be constrained due to limited availability of certain raw materials and limited production capacity."

Turning to component maintenance, Wittingen says demand is "usually aligned with utilisation of aircraft. As utilisation is increasing, the demand for component maintenance will be strong as well."

Component repair is a growing business area for Fokker Services Group. "For our component repair supply chain, we have requested a higher volume of parts as a response to this growth," comments Poldermans.

"We have been recruiting base maintenance and component maintenance colleagues with strong problem-solving skills. We find the right colleagues to join our organisation, and promote those who are starting their career in our apprenticeship programmes to various other business areas like sheet metal work and component repairs."

HAECO's Kendall says that teardowns of older aircraft have created a supply of used serviceable material for the aftermarket. "That also adds to the availability of green time for components," he says. "There have also been concessions or suspensions on component agreements between airlines and service providers, which are now starting to be reactivated as those aircraft come back into service."

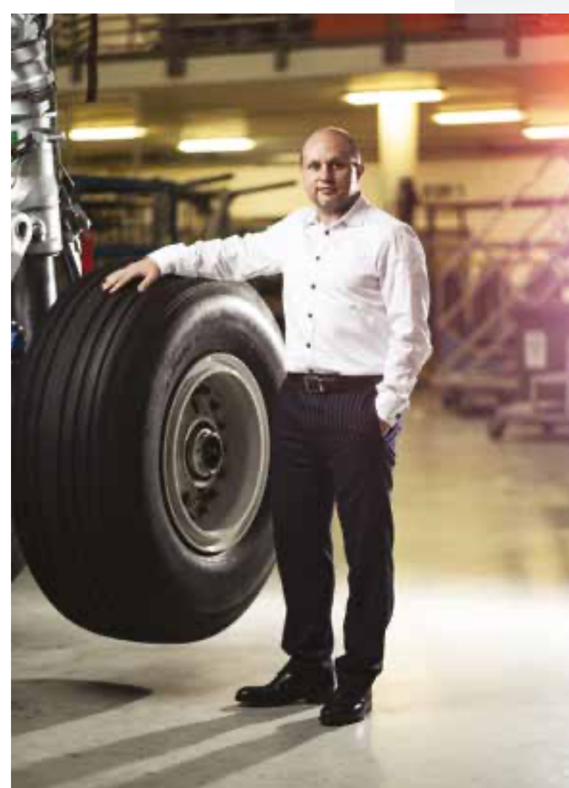
The outlook for line maintenance remains positive, too, according to Magnetic MRO, "albeit slower than expected due to slower long-haul recovery into late 2022 and spring 2023". MROs are being challenged by an increased operating cost burden which will potentially grow next year.

Airlines may also see slower recovery because of cost-of-living increases, which in turn results in limited schedules. This directly impacts line maintenance services. "Next year will require even greater cooperation and partnerships both internally and externally, in order to be successful and competitive," the company says.

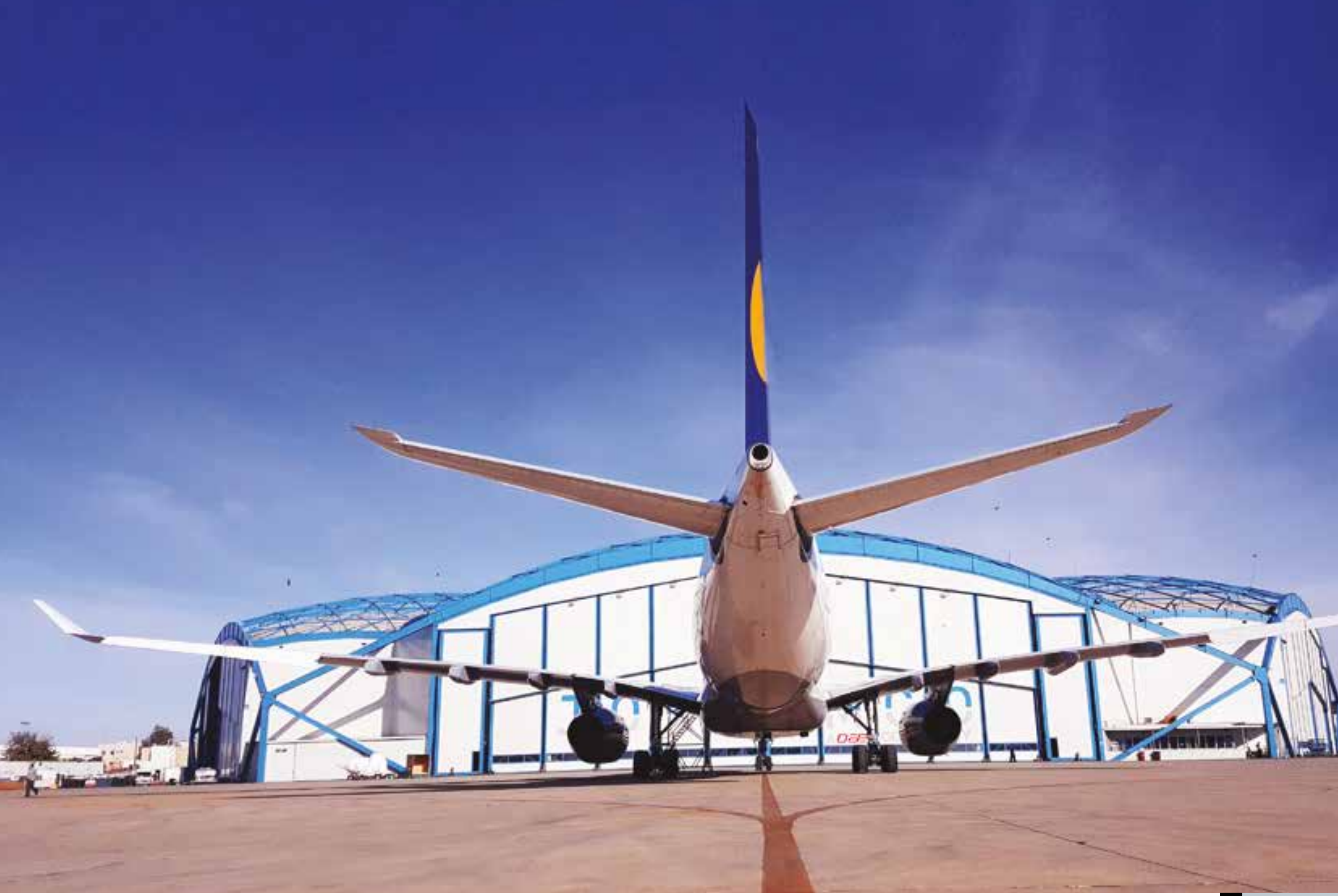
Labour shortages

There will be a variety of factors challenging MROs around the world in 2023. "While recovery of the aviation industry continues to gain traction, uncertainties due to geopolitical tensions, availability of skilled manpower, supply chain disruptions, and heightened risk of global recession from rising interest rates will pose challenges," points out Singapore-headquartered SIA Engineering Company.

For its part, the company "will maintain vigilance and nimbleness in managing costs" while pursuing "sustainable growth". A spokesperson states: "We will continue to seek opportunities to expand our capabilities and geographical presence through acquisitions and partnerships, as well as invest in our staff to build a future-ready workforce capable of supporting new-generation aircraft and engine platforms."



2



1

"Manufacturers still face the challenge of sourcing raw materials such as aluminium and electric components"

For Lufthansa Technik's Doyle, "by far the biggest challenge our industry needs to overcome is producing sufficient qualified personnel to meet growing demand". He says: "Attraction and retention of qualified personnel will become a source of competitive advantage in the short to medium term, so we all need to change our approach and invest heavily in people."

HAECO's Kendall agrees with this sentiment. "There has been a migration of the workforce from our industry into other industries," he says. "Recruitment drives are needed to not only try and bring back people who may have left during the pandemic, but also bring youngsters into the industry.

"There is a challenge of supply and capacity, not of hangar space but of labour availability. This will be a real challenge for the industry, particularly in the first half of 2023, but also for the rest of the year and into 2024. Even if you recruit someone, you can't put them into productive work immediately, you have to train them."

Etihad Engineering's Doherty says it "is imperative that companies begin to address the training issues and invest in development programmes to ensure that new talent is introduced to the industry. While the forecast for the sector is positive, the challenges facing the industry need immediate attention to avoid a self-made crisis."

Joramco is among the companies to have recognised and addressed the longer-term issues. "We're putting a lot of new investment into our training academy, and are currently spending more than US $1million per year on it," reports Currie. "Academies are not profit centres. That is why very few companies will invest significantly in them, which I think is an absolute travesty in this industry. A few of us are investing, but governments are also not contributing and stepping in.

"That said, the Jordanian government has recently made pledges to us to invest in 100 new students to enter into our academy. They see technical degrees, qualifications and career paths as still a very popular way to go within Jordan, whereas in other parts of the world this is not the way people are going."

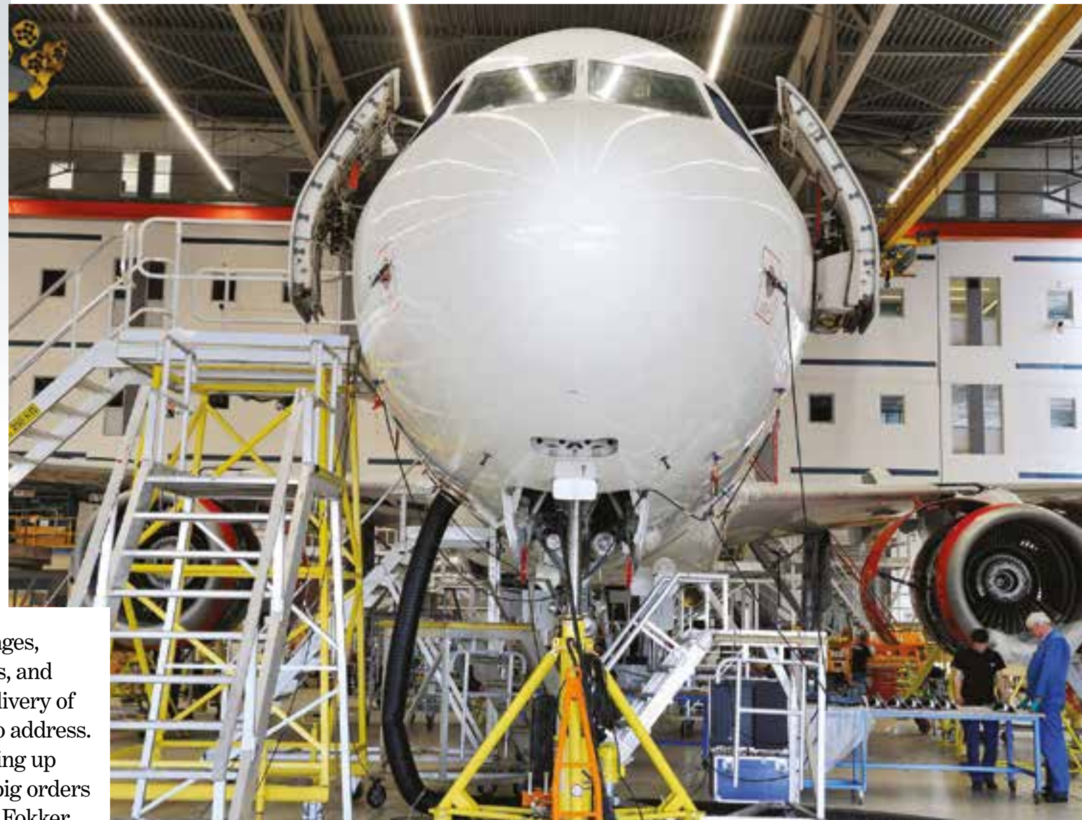
Pratt & Whitney is also committed to finding solutions, and Kirkpatrick says the company "will continue to focus on attracting top talent" next year. "This year, Pratt & Whitney Aftermarket Operations has already hired hundreds of employees and we are continuing to establish partnerships with A&P and trade schools, attend on-site career fairs, and build more robust on-boarding and training programmes," he adds.

Supply chain issues

Moving onto supply chain disruptions, Fokker Services Group's Poldermans sees this as "one of the biggest ongoing challenges facing the MRO sector". He explains: "Issues on this topic began a few years ago right at the start of the pandemic, and we predict it will continue for a couple more years to come.

$1M

Joramco is investing over US $1million per year on its training academy, Joramco Academy. Graduates get employment priority with the company



2

"From maintenance staff shortages, disruptions with logistics suppliers, and delays with the production and delivery of new parts, there are many areas to address. To tackle this, we have been stocking up our Netherlands warehouse with big orders of OEM materials. Additionally, at Fokker Services Group, we have EASA design and production approvals in place to invent and implement new solutions. With these approvals, we can counter specific supply chain disruptions."

StandardAero's Prebble says that supply chain issues have contributed to extended turnaround times during 2022. "Simply hoping that this situation recovers in 2023 is not a convincing strategy, so we are instead committed to working with our supply base and customers to ensure as much transparency as possible of demand and supply, keeping communication channels open while problems persist," he says.

"Overhaul shop visit slot capacity constraints have been one of the factors behind the recent increase in demand for modular workscopes and hospital shop visits, and we expect these MRO offerings to remain popular during 2023."

The challenge of logistic lead times is driving greater regionality in MRO sourcing, according to AJW Technique's Mallette. "As such, OEM centres are sharing services across the globe to mitigate capacity constraints and are working with customers and logistic partners to understand the supply chain vulnerabilities that exist, and how to overcome them," he says. "This includes the possible increase by operators in the need to embrace increasing levels of used serviceable material or Parts Manufacturer Approval (PMA) based solutions.

"Further affecting the already struggling supply chain is the introduction of additional tariffs and increased border checks brought about by Brexit, the effects of which will be felt going into the new year. The immense strain on administrators, and the aviation infrastructure in general, is not easing, and will be here for the near future.

"The deterioration in the OEM and supplier performance environment concerning processing time, and the rising cost of raw materials and labour are influencing their underperformance, which, despite recruitment efforts, can also be attributed to skills and staff shortages across the aviation industry.

"Manufacturers still face the challenge of sourcing raw materials such as aluminium and electric components going into 2023 as global shortages persist."

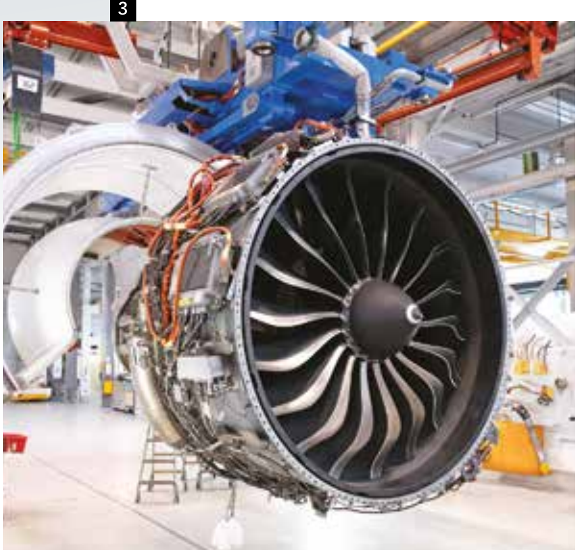
Magnetic MRO's Kotka says MROs are having "to cope with constantly increasing spare parts prices" on the one hand, and on the other "we are in a difficult situation when negotiating with customers to increase service costs".

He says that the shortage of skilled workers and the continued supply chain challenges are driving a lack of MRO capacity in Europe. "Inevitably the cost increase for MROs will be absorbed by needed radical efficiency improvements but also increased service rates to customers," he warns.

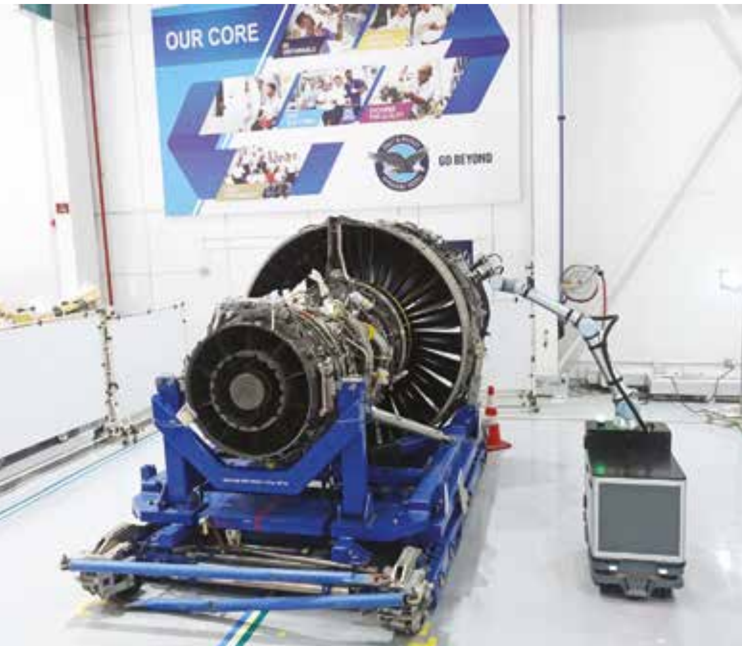
Digital and sustainable

Embracing digitalisation can help companies achieve efficiency improvements. "I think a key focus for 2023 will be for companies to recover in profitability. To help that happen, airlines and MRO providers have to

3



1. Joramco will start building the first of two new hangars in Q1 2023
2. Fokker Services Group is focusing on digitisation of aircraft maintenance data
3. Lufthansa Technik will continue to invest in the ramp-up of capability for the LEAP-1A & -1B motors next year



1

1. Pratt & Whitney is making a dedicated effort to modernise and transform its global operations, supporting its overall Industry 4.0 strategy
2. A drilling robot employed by ST Engineering for floor grid drilling during freighter conversion work

3,020

Greenhouse gas emissions at Pratt & Whitney's Arkansas site have been reduced by 3,020 metric tonnes per year since 2010

"Digitalisation will be one of the persistent trends that pushes the industry forward and into the future"

be more cost efficient, productive and sustainable," says ST Engineering's Lam. "One way is to transform the hangars and workshops into a smart environment that makes greater use of robotics and digital technologies. In this regard, digitalisation will be one of the persistent trends that pushes the industry forward and into the future. This will not only improve productivity, but also alleviate some of the challenges arising from the manpower crunch, which is expected to continue into 2023."

Augmented reality, high-resolution cameras and drones are alternative technologies that can be used for the inspection of aircraft.

2

HAECO is among the companies putting such technologies in place, with some success. "Ultimately our business, particularly on airframes, is very labour intensive so it's very difficult to move the needle significantly with technology to replace the labour input," notes Kendall. "We are also in a very highly regulated industry, so these things take time and sometimes quite a bit of persuasion to get regulators to accept the new technologies and ways of doing things."

Kendall thinks that while there are a lot of good new technological tools out there "that can and will be put to good use, we'll get frustrated as an industry in the implementation of them because there are limitations to adoption. As an industry we are behind the curve, so there are a lot of opportunities to use digital tools and the data we have as an industry."

Rising costs will bring the topic of digitalisation back onto the agenda of most airlines who are searching for operational optimisation, predicts Lufthansa Technik's Doyle. "The sharing of data between airline and MRO offers us a chance to optimise together, to bring predictive analytics into the operational workflows and generate measurable savings," he says.

Sustainability is another issue at the forefront of many MRO companies' minds, especially with skyrocketing fuel prices. "Sustainability has become the 'new normal'. It is no longer acceptable to just talk about it, we need to deliver on it and ensure we are providing MRO services as sustainably as possible and offering airlines more sustainable alternatives," says Doyle.

"Sustainability products are getting a lot of traction in the market and I am pleased to see airlines creating a lot of 'pull' for these products."

It may be the case that anything the MRO industry can do to become more sustainable will pale in terms of impact compared to engine and aircraft emissions, but that does not mean there aren't worthwhile initiatives out there. For example, Pratt & Whitney's MRO sites have been "re-imagining operations and pursuing greener practices", according to Kirkpatrick. "Since 2010, water consumption at our Arkansas site has improved by 46 per cent and greenhouse gas emissions have reduced by 3,020 metric tonnes per year," he reports.

"Employees at our Dallas site developed an environmentally friendly laser for cleaning engine parts that vaporises grit, dust and rust from components, reducing material consumption, emissions and industrial waste." There are other initiatives too, he says.

There are also some good examples at Fokker Services Group. "Investments have been made in our building and utility infrastructure in order to improve our carbon footprint drastically, for instance by introducing alternate energy sources such as solar," says Poldermans.

"More efforts are being considered such as electric vehicles for handling and transport in our facilities, while the reduction of waste and its environmentally friendly handling is another topic that has caught our attention."

There is plenty for MRO companies to do in 2023 – whether it is getting through a high workload, continuing their digital journeys, attracting new talent or implementing sustainability initiatives – but there are enough reasons to believe that it can indeed be the "outstanding year" many are hoping for.