



AAV February 2020 » FEATURES » Keeping them flying

Keeping them flying



SAESL CEO Simon Middlebrough says that finding skilled labour is one of his biggest challenges in 2021. ROLLS-ROYCE

Engine MRO providers are coming up with innovative methods, new paradigms and hybrid production models to keep older engines flying longer and new-generation engines out of their shops altogether. Michael Doran takes a look under the hood.

SOME OF THE NEW APPROACHES include 'hospital bays', quickturn services, hybrid production lines, taking the MRO capability to the engine and building their own training centre to overcome people shortages. This is how four players are using different approaches to solve the same puzzle to keep more engines in the air.

Rolls-Royce has a mix of company-owned and joint-ventures in Asia-Pacific and key to the region is Singapore Aero Engine Services (SAESL), a joint-venture with SIA Engineering, where Simon Middlebrough took over as CEO in August 2019. Middlebrough says that Rolls-Royce has made a big effort to grow its MRO capacity globally over the last two years and within Asia-Pacific SAESL is an integral part of the network.

“Rolls-Royce as a customer is pleased with how SAESL has grown its capacity and capability quickly over the last 18 to 24 months to meet all the increasing demand, whether it’s from success in sales or the support of tactical issues we see around us at the moment,” he says. “I think we have invested wisely in earlier years around the physical infrastructure, but labour will probably be the biggest challenge over the next 18 to 24 months. It’s a combination of volume and then making sure we can robustly and safely train everybody up to the right standard.”

In raw numbers, SAESL inducted 282 engines in 2019 and is looking to boost that to around 321 this year. The facility has capability for all of the Rolls-Royce engine family and has seen its product mix change in support of the TRENT 1000 issues. With the bulk of these issues set to be completed by mid-2020, capacity will be freed up leading to increased activity around the TRENT 7000 and XWB engines in the second half of the year.

“Going forward over the next three or four years the portfolio balances back out again so that we have a reasonable spread across the four main engine programs of the 900, 1000, XWB and 7000,” Middlebrough says.

While the TRENT 1000 issues have cost Rolls-Royce around US\$3.1 billion and disrupted the operations of many airlines, it seems the pressure to rectify the issues has spawned some new approaches to engine MRO. Middlebrough says that meeting the TRENT 1000 timescale has meant “making sure that we can do much of the maintenance in non-traditional ways and we’ve done a lot of work to make sure that we can get at some of the issues in the engine in a much more surgical way, either very close to the wing or in the field. So, we’re also developing capability in Singapore for these lighter worksopes that we can keep out of the main shops and clearly from a network capacity point of view that’s extremely helpful,” he says. “It also forces Rolls-Royce to break a few paradigms about what they can do and come up with more creative solutions, which I think are borne out of a bad position but probably will help them in the long term.”

In a regional sense this means that Roll-Royce will work with MRO providers such as HAECO in Hong Kong or SIAEC in Singapore on these light maintenance activities which, in some cases, may result in a type of hybrid shop visit where most of the engine work is done near-wing.

Asked what his biggest challenge is for 2020, Middlebrough says that meeting capacity demand and building up his workforce is front of mind. “I think we’ve been on, and continue to be on, a huge capacity ramp-up and it’s really the combination of what I do to put the pieces in place and so I am running as fast as I can to put capacity in place,” he says. “It’s just making sure the capacity and capability ramp-up is done on time and in such a way that it supports what Rolls-Royce needs.”

GE Services Marketing Leader Bill Dwyer believes that the capacity to meet GE and CFM customers' needs is in place locally and there is a very robust MRO footprint across Asia-Pacific. "We have overhaul shops in Asia as do many of our customers and for CFM alone there are 11 overhaul shops in the region," he says.

Currently GE and Safran together do around 40 percent of the CFM MRO and they expect to do about the same on the LEAP engines, which means that third-party MROs are an important part of the network, now and in the future.

"We see the LEAP developing very much like the CFM56, so third party MROs will play a major role in supporting the fleet globally," Dwyer said. "There's 22,000 CFM56s in service and on LEAP we have already sold 19,000 and we're just three years into service."

As the sole engine choice for the Boeing 737 MAX, the take-up of the LEAP-1B has not yet reached the heights expected but the silver lining is that this delay has allowed time for some of the entry-into-service issues to be addressed.

"For CFM we set up 17 quick turn sites, so if we have to change a turbine shroud earlier than expected we do that very small workscope in a quick-turn site and that keeps overhaul shops from being burdened," Dwyer says.

The biggest portion of shop visits in the region are for the CFM56 with almost 60 percent of those engines yet to have their first maintenance event. Dwyer says he is not sure if the MAX grounding has significantly impacted MRO capacity and although there are signs of extended life for the CFM56-3 engine, he believes that MRO demand is tight because the CFM is still in a growth mode.

ROLLS-ROYCE

"If you look back maybe 20 years ago there was very little engine MRO footprint in Asia so there has been significant expansion and a lot of that has been in China," he says. "The big three airlines, China Eastern, China Southern and Air China, all have CFM56 shops and there are independents in Singapore and across the region."

Looking ahead to the introduction of the Boeing 777X and the GE9X, GE started planning for the engine's support five years ago and have already set up the first MRO facility, a joint-venture with Lufthansa Technik in Poland called XEOS.

"That's an example of an engine that's still some time from being in-service but there's already plant and equipment and things prepared to support flight tests and early customers so there has been a very robust plan put in place for MRO support," Dwyer explains. "I would say we do spend a lot of time making sure that there are plans and actions in place to support the fleet, both in Asia and elsewhere and there have been many external partners who have jumped in and supported us," he adds. "So, we expect that to happen on new engines like LEAP, GEnx and GE9X like it has happened on other programmes in the past."

For MTU Maintenance in China, 2020's biggest challenge is finding the slots to meet demand while at the same time extending the facility to add an extra 50 percent capacity. President and CEO Jaap Beijer says the extension will be completed in the third quarter this year and the business is changing its production system to cope with the increase in capacity and the start of MRO on the CFM LEAP engine.

The existing dock-system sees the engine disassembled, repaired and reassembled in one location whereas a flow-line system is akin to a car assembly line that moves through stations. "We have thought a lot about this, and we decided to go with a hybrid system that is half dock and half flow-line which we think is the best way to get engines through the shop as fast as possible," he says.

In 2019 MTU Zhuhai completed around 350 shop visits and Beijer predicts this will rise to more than 500 once the integration is fully completed and even with such a large increase production slots will remain extremely tight in 2021.

To handle the LEAP engine, MTU has set-up a dedicated facility within the main operation and it has already inducted its first engine to do a quick-turn workscope. "We have a totally separate environment and it helps the LEAP because we have the time and not the pressure," says Beijer. "For our volumes we know that the CFMs and the Vs still have their peak ahead of them and the peak for the LEAP is not for another four to six years," he says. "It is still a CFM and V market and not yet a GTF or LEAP market."

To expand, MTU needs to find large numbers of trained technicians and recruitment is a major headache for Beijer. To overcome this, MTU is setting up a training college onsite in Zhuhai that will cover theory and practical training along the lines of a Part 145 training centre. "We need it otherwise we would not have enough people, or we would have so many inexperienced people that our operation would suffer," he says. "We will educate them on a professional schedule and within one to two years we will have really well-trained people that can work well from day one."

While increasing capacity by 50 percent will buy MTU Zhuhai some time, it likely won't be enough to satisfy the demand of both joint-venture partner China Southern Airlines and the seemingly insatiable engine MRO demand building in Asia. When asked about that, Beijer hinted that a second location in China may well be in his and MTU's thinking.

"I think what I would say is I don't want to grow this shop too big because at 450 engines it makes sense to do it in one shop because then the efficiency will grow significantly," he says. "I think that doesn't extend to a really big shop so if we grow further it's a possibility, we are looking into a second shop."

For Aero Norway, MRO on the CFM56 engine is the sole business in their Stavanger, Norway facility and through their mobile onsite teams. Chief Operating Officer Neil Russell says that with high demand and limited MRO capacity available globally 2020 will be another strong year of

growth for Aero Norway. “Since 2013 we have grown the business every year and we keep adding capacity to meet the growth,” he says. “We have increased capacity by thirty percent since 2017 and this year we expect to induct more than 100 engines.”

To meet the growing workload, Aero Norway reengineered their workflow by adding designated repair bays for lighter MRO and introducing mobile teams to take their capabilities to the customer.

“If we have a heavy maintenance job, we schedule that into our normal workflow but to give us more flexibility we added repair bays or hospital bays, as we call them, to do the lighter worksopes,” he says.

The mobile teams are used when a customer has scheduling demands and the repair can be done on-wing or in the customers facility or when an unexpected issue arises that needs immediate attention.

“Some customers don’t like to drop the engine or if they do, they want to keep it near the aircraft, so we go out and do repairs that are within our capabilities there,” Russell explains.

The MAX grounding has meant that some customers have delayed MRO work on engines because of the uncertainty over how long they will remain in service. As these engines get closer to exhausting their green-time, owners face the decision of doing a major MRO visit or retiring the engine.

“The engines we do are for the B737 and A320 so there are a lot of engines that will have to do a shop visit this year or be shut down,” Russell explains. “A lot of leasing companies have contacted us to schedule shop visits this year to add engine life so for us the MAX issue is either a feast or a famine.”

Aero Norway is looking to expand its profile in Asia-Pacific and Russell says they have already been doing MRO work for operators in Indonesia and China and are having discussions in India. “So far Asia has not been a core business for us but in the future it ’s something we want to be involved in because it is such a massive market,” concludes Russell. ✈



View as flipbook