

MTU Maintenance has just launched Asset Value Maximization so that carriers with surplus engines or parts can optimise usage or maximise value by remarketing parts.



Chain reactions

Henry Canaday looks at ways in which airline maintenance departments and MRO providers are helped to keep just the right amount of spares inventory.

Get rotables repaired fast and economically, carry enough to prevent AOGs, but no more, and put them in the right place. Keep expendables plentiful enough to keep check lines moving, but don't stock too many or pay too much. Know your vendors and rely only on the best.

Then squeeze every obligated repair and promised turnaround time from warranties and guarantees. Oh, and do all this with minimum in-house staff and, perhaps, some very old IT systems.

Supply managers' duties do not get any easier, and competition continually sets higher standards. Fortunately, airlines can now choose from a wider set of approaches. They can outsource all or just segments of supply chain management, use vendors for all or just some parts and negotiate many different kinds of contracts.

"Every airline is different in its supply chain needs," summarises Boris Wolstenholme, CEO of AJW Aviation. "They operate in different environments and have different routes, differently aged fleets, different software and different financial and other skills. Marrying solutions to these different needs is one way we differentiate ourselves."

■ EXPANSION PLANS

AJW supports Boeing and Airbus models, about 80% narrowbodies, and is considering a move into regional aircraft. It usually covers entire ATA chapters of rotables, but now manages consumables and expendables for easyJet and seeks to expand this service. It supports auxiliary power units and tears down, leases, rebuilds and manages shop visits for engines, focusing on CFM56-5Bs, CFM56-7Bs and V2500s.

The company has 850 aircraft under flight-hour programmes. Alternatively, it can just help with AOGs and part stocks. "Whatever drives costs down," Wolstenholme says. Subsidiary AJW Technique does more than a third of repairs, OEMs and independent shops the rest. The firm can also bring repair business into customer shops, as it does for Air New Zealand.

AJW flexibility has proven popular, with the company averaging annual revenue growth of around 15% since 2000. AJW's future will stress e-commerce, more trend monitoring and more proactive maintenance. It already has contracts to support A320neos and expects to support 737 MAXs.

Air France Industries KLM Engineering & Maintenance (AFI KLM E&M) offers customers four kinds of supply chain management: Component Maintenance and Availability, an exchange programme; Component Repair Management Service for an airline's own components; Engine Maintenance and Availability; and Aircraft Parts Availability. Support is offered under a variety of terms, with cost-per-hour, cost-per-landing and time-and-materials options.

The MRO supports all airframe and engine components on all Boeing and Airbus models, plus E-Jets and CRJs. Coverage is global, with warehouses in Amsterdam, Paris,



AFI KLM E&M's supply chain management offerings are available under a variety of terms – cost-per-hour, cost-per-landing or time-and-materials.

The firm has about a thousand aircraft now under some form of flight-hour agreement. These programmes are global, and cover 737s and A320 family aircraft, E-Jets and all CRJs. ATRs will soon be covered. Flight-hour support is available for all non-engine rotables, with consumables and expendables supported under guaranteed service-level contracts.

BAE Systems Regional Aircraft offers two rate-per-flying-hour programmes, JetSpares for Avros RJs and BAe 146s and MACRO for Jetstream 31s, 32s and 41s, explains managing director Sean McGovern. BAE has just enhanced JetSpares with new performance agreements from component vendors. South Africa's Airlink is the first customer for the new version.

Both JetSpares and MACRO have been very popular with operators of BAE aircraft, with 112 aeroplanes now covered. Carriers such as CityJet, Malmo Aviation, Swiss, Summit Air, Cobham Aviation and TNT Express use JetSpares, while Sky Express, Eastern Airways and Yeti Airlines are supported by MACRO.

These programmes generally cover rotables apart from engines and landing gears. Up to 800 rotables can be covered, but customers usually take about 500. Carriers get repairs and guaranteed deliveries – almost immediate for AOGs and within three to five days for shop requirements.

Unlike OEM flight-hour programmes, BAE programmes are nose-to-tail, avoiding the need to manage up to 20 vendors. Compared with MROs, McGovern says BAE generally offers broader coverage, better reliability and technical support that quickly spots and then remedies problems.

Customers can choose coverage and either add or subtract parts from the programme. For example, some airlines choose to take the repair risk on APUs, a major expense. Neither JetSpares nor MACRO covers consumables, but BAE can help with these items too.

Customers usually stick with JetSpares and MACRO as long as they operate covered aircraft. Some operators convert aircraft →

Miami, Kuala Lumpur, Singapore, Dubai, London and Hanoi.

Component and logistics director Harmen Lanser stresses that AFI KLM E&M's supply chain offers are backed by excellent engineering. The MRO exploits the experience of its parent airlines to improve reliability and availability of both engines and components. In-house repair shops guarantee short turn times and quality work without unnecessary repairs. "Engineering knowledge improves reliability of components and develops repairs that lower maintenance costs," Lanser states.

The Air France-KLM network enables excellent AOG response, with components loaded just before departure. Membership of the International Airlines Technical Pool (IATP) supplements AFI KLM E&M's own stocks with parts at airports around the world.

AAR's Airinmar unit helps airlines manage supply chains, specialising in the management of repair cycles. It supports all major commercial aircraft types, explains president Tom Wilson. The company typically focuses on system and interior components rather than large items like engines, landing gears or APUs. It does work with aerostructures like thrust reversers, inlet cowls and flight control surfaces.

Airinmar has an in-house IT system to track repairs. "Airline ERP systems may track some, but far from all logistics," Wilson says. "Our IT tracks every stop a part hits, from quotes to shipping and receiving."

Airinmar helps carriers manage workflows in procurement and helps control costs, reducing quotes after receipt. "We do lots of work as silent partners in quote consolidation, approvals and queries," Wilson explains. The firm manages guaranteed shop processing

times, the commitments Boeing and Airbus receive from Tier 1 suppliers for quick repairs.

Gains can be substantial. Wilson estimates that Airinmar achieves 8%-20% reductions in repair costs, 40%-60% TAT reductions and a 50% gain in back-office efficiency.

Airinmar's approach has proved attractive to major airlines, to regionals like ExpressJet and to low-fare carriers like Southwest Airlines. The company also supports parent AAR's work for Mesa and Jazz, and Bombardier's Smart Parts programme for Q400s.

■ RAPID REVIEWS

One secret of Airinmar's success is efficiently handling massive volumes, notes Chris Fiddes, supply chain vice-president at AAR. Airline repair managers concentrate on speed and miss opportunities to review workscopes and quotes. Airinmar's IT minimises manual effort, letting computers analyse the data. For example, ExpressJet has roughly 20,000 orders a year, which would require 30 seconds each for manual scrutiny. Airinmar executes the same reviews more effectively in fractions of seconds.

Fiddes says no other firm offers the complete support Airinmar does on all ATA chapters, including engineer reviews of workscopes and management of all three levels of warranty: from component OEMs; repair shop warranties; and airframe OEM guarantees. It now manages components on 7,000 aircraft.

In addition to Airinmar's services, AAR offers rotatable support under flight-hour agreements. Quality reviews are done in AAR warehouses so "when it hits their docks, they do not have to check quality. They just scan it in, reducing touch time," Fiddes notes.



Yeti Airlines recently extended its MACRO contract with BAE Systems Regional Aircraft for a further two years. The agreement covers the airline's fleet of seven Jetstream 41s and 240 separate part numbers. Under the contract, BAE Systems retains responsibility for managing the spares inventory, logistics and repairs.

to non-transport uses, such as firefighting, and BAE can tailor a programme for these low-use purposes as flying hours decline.

Engines often require their own solutions, and these too have improved in recent years. For example, MTU Maintenance offers airlines individually tailored MRO solutions, now branded as MTUPlus, that save considerable costs, according to Leo Koppers, senior vice-president of maintenance.

Koppers says MTU's high-tech repairs are much more cost-effective than OEM repairs or part replacements. "The techniques we use give expensive engine components a second, third or even fourth lease on life." The company develops these repairs not only for V2500s, but for CF34s and CFM56s as well. MTU's own OEM experience and co-operation with universities and research institutions help. It has developed cutting-edge techniques such as brazing, laser healing, laser powder cladding tip repairs and plasma coating for turbines.

MTUPlus includes tailored solutions for aging engines, such as CF6-50s and -80C2s, PW2000s, CF34-3s and CFM56-3s. The programmes include cost-effective maintenance with salvage of materials for reuse by airlines and alternatives such as leases and exchanges.

MTUPlus New Engine Solutions are similar, targeting more recent engines like V2500-A5s, CFM56-5Bs and -7s, CF34-8s and -10s and GE90s. Here again, customised worksopes and high-tech repairs extend lives at a lower cost per hour.

MTU Maintenance has just launched Asset Value Maximization for carriers seeking smooth exits for end-of-life engines. Airlines with surplus engines or parts can optimise usage or maximise material value by remarketing parts. MTU's expertise in residual values supports this offer, which is executed by MTU Maintenance Lease Services, a joint venture with Sumitomo. Asset Value Maximization is available for both older and current-generation engines.

GE and its joint ventures, CFM and Engine Alliance, have 34,000 engines flying, of

which 4,000 head into shops each year. GE Aviation Services provisions airlines that operate the engines and supplies material for their overhaul.

"Customer-facing teams work with airlines to understand requirements, translating these to recommended inventory for on-wing support," remarks the company's spokesman, Perry Bradley. Most of these parts are expendables and line-replaceable units made by third parties.

■ PREDICTING DEMAND

For overhauls, GE uses sophisticated forecasting models to anticipate demand in advance of shop visits. This is necessary because lead times range from six months for items like turbine blades and nozzles to 18 months for larger items like engine cases.

Forecasts rely on history, predicted shop visits, engine performance and analytics. Accurate forecasts enable airlines to minimise inventories, saving money. GE's catalogue promises delivery of 80% of parts in five days, and the rest within 30 days. In practice, it does much better, delivering 94%-95% of parts by a customer's request date.

Bradley adds that GE engineers also develop hundreds of new repairs each year. And the company offers used serviceable materials for CF34s, CF6s, GE90s and GENxs from warehouses in Kansas, Amsterdam and Singapore (CFM Materials manages used material for CFM56s). So far, GE has delivered 97% of these used parts by customers' request dates in 2015.

The 36-year-old Farsound Aviation offers supply chain and logistics solutions, distributing and stocking engine parts from hundreds of suppliers. It provides fabricated housings, machined parts, fasteners, seals, gaskets, clamps, clips and much more for a variety of engines, including those on 737s and A320s.

The company works globally and offers a full range of supply management services, such as complex line-side kitting, managing consigned inventory in vertical-lift carousels, line-feed bins and AOG support. "We also work hand in hand with customers, putting our own local people right there on the shop floor," says chairman Kevin Sargent.

Distinctively, Farsound focuses exclusively on engine parts. "We have significant knowledge and experience in that sector," stresses Sargent. "We are not a jack of all trades, so we put particular focus on forecasting customer requirements in a very volatile and unpredictable sector."

Farsound managers often know what customers will need before shop or airline managers do. It can thus acquire an inventory at its own cost to ensure it meets customer requirements. Farsound maintains availability at a "class-leading" 99.5%. "So the big difference between Farsound and its competitors is reliable and consistent product availability because of our expertise in the sector," says Sargent.

The company's biggest customers are major engine shops, such as Hong Kong Aero Engine Services. It also works with Mubadala's Turbine Services and Solutions Aerospace in Abu Dhabi and Taikoo Engine Services in Xiamen, China. Sargent wants to expand rapidly in the Middle East and Asia, simply because these are the two fastest-growing aviation maintenance markets (hence the company exhibiting at the recent Dubai Airshow).

Farsound already has staff in Singapore and Texas, and recently recruited a representative in the UAE to support Dubai and Abu Dhabi. Sargent is looking to put someone in China to focus on Beijing and Shanghai, and wants to add another person in the US to help with a project Farsound expects to do with GE Aviation. ■