



From the ground up

There's a continuous focus on cost reduction through maintenance.
Photo: MAEL

The MRO industry will need to evolve significantly to meet changing demand driven by growth, geographic shifts, fleet mix and new technology. **Keith Mwanalushi** speaks to key players on the trends in airframe maintenance.

Oliver Wyman's 2017 assessment and 10-year outlook for the commercial airline transport fleet and the associated MRO reveals that the commercial air transport MRO market will revolve around the growth and changes of the global fleet. The total MRO spend in 2017 is expected to be \$75.6 billion. It will rise to \$84.9 billion by 2022, representing a 2.4% CAGR over the five-year period. Over the full 10-year period, the global air transport MRO market will grow on average 3.8% annually, rising to \$109.2 billion by 2027.

The report indicates that airframe maintenance will continue its trend of lower unit costs, driven primarily by heavy maintenance visit intervals stretching to 12 years. This is possible through the increased use of composites and hybrid alloys in new-generation aircraft, providing better fatigue and corrosion resistance than previous generations.

From an airline's perspective, there is a continuous focus on cost reduction through maintenance. "We continuously review our processes to ensure we are maximising productivity and reducing maintenance downtimes where possible," states David Doherty Head of Commercial, Monarch Aircraft Engineering (MAEL).

It is essential to co-ordinate both base and line resources to ensure that as much work as possible is carried out in between sectors when the aircraft is on the ground overnight, Doherty says. "This has a positive effect on fleet reliability as well as reducing the downtime needed for the heavier checks. We are strategically targeting third party operators who have heavy maintenance requirements during different calendar periods in order to offset the seasonal fluctuations, which results in improved manpower utilisation and a lower overall man-hour cost for our business," he explains.

MROs are competing in a global market where cost is a major driver. In this environment, customer retention and satisfaction become increasingly important along with the ability to deliver high quality at competitive prices.

"At SR Technics, we are focused on developing strong, long-term partnerships and delivering tailored solutions that add real value. We have also expanded our global reach to be even closer to our customers," says Jakob Straub, Head of Aircraft Services and Line Maintenance at SR Technics.



MROs are competing in a global market where cost is a major driver.
Photo: Czech Airlines Technics

For example, SR is currently assessing an opportunity to significantly increase operations in Malta, as the country offers an ideal location, a suitable business environment and a highly skilled workforce to support their operations.

Magnetic MRO highlights the main factor which drives maintenance cost to go down is utilising new aircraft models – i.e. B787, A350, CS-series and so on with much more comprehensive built-in predictive maintenance capabilities and increased periods between scheduled maintenance.

For the existing models of civil aircraft (Magnetic MRO is dealing with B737-series and A320-series aircraft) there are no any significant changes, according to Sergei Shkolnik, Base Maintenance Director at Magnetic MRO. He reminds that as fleets are becoming more mature, the maintenance costs are rising.

IAI Bedek is constantly running several programmes which are focused on various ways which will generate cost and efficiency improvements. “Under these programmes we are examining the existing work methods as well as the direct and indirect derived costs versus the most up-to-date and future developed alternatives that would enable us to increase cost savings and operational efficiency,” indicates Lior Cohen Director Marketing and Business Development IAI - Bedek Aviation Group.

Cohen says the main portion of the saving which result from the optimisation efforts are directly channelled to benefit customer’s in order to reduce their costs and increase their gain while also keeping the highest quality standards.



Mike Cazaz , CEO at Werner Aero Services

Mike Cazaz, CEO and President of Werner Aero Services sees that airlines are increasingly relying on used surplus material (USM) to lower maintenance costs and the most economic source of USM is from aircraft teardowns. “Werner Aero Services, a specialist in the acquisition and disassembly of end of life aircraft is a provider of USM to airlines, MROs and other suppliers. The material we harvest from these aircraft is refurbished

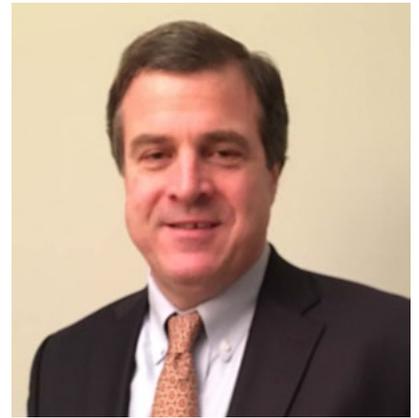
through our network of high quality repair agencies for use to support direct sale or pooling programmes for operators,” states Cazaz.

In reference to reducing maintenance cost AJ Walter (AJW) says in a statement: “Our strategy is to ensure that we are fully engaged with our airline customers technical departments, evaluating their reliability data and making sure the repair standard we offer maximises component time on wing and minimises schedule interruptions and delays.”

The aircraft heavy maintenance market is one of the key segments of MRO and MROs are already expanding facilities to increase capacity and open new operations. Due to lower fuel prices airlines are keeping aircraft in their fleets longer, fleets are becoming more matured and require more maintenance in some instance.

“In the meantime passenger traffic is increasing, new aircraft deliveries are growing and aircraft utilisation is growing too, hence, again, more maintenance is required. That is why in the short term (5-6 years) MRO’s will benefit from increased demand for heavy maintenance,” suggests Shkolnik from Magnetic MRO.

Kirk Baugher, EVP Business Development at PENTAGON 2000 Software feels heavy maintenance inspections require a broad range of resources that are often limited within an MRO organisation. He says inspections are labour intensive, utilise highly skilled resources, and often involve the use of expensive and scarce tools.



Baugher says IT infrastructure will all contribute to lowering of maintenance costs.
Photo - PENTAGON

“Two key trends that we are seeing in the market are the use of mobile apps, and the use of advanced

planning and scheduling systems to maximise the efficient use of limited technical resources and tools. Baugher adds the ability to put the right skilled person with the right information and the right tool in the right place at the right time has a dramatic impact on maximising the efficiency and effectiveness of an MRO organisation’s limited critical inspection resources,” Baugher stipulates.

MAEL is seeing a lot of older high cycle aircraft come through the facility, and a lot of freighter aircraft too. “These aircraft tend to have heavy corrosion or structural rework, but by collating the defect data of previous inputs, we can begin to target known problems areas and anticipate rectification requirements. On some of the much older generation aircraft, structural parts are becoming harder to source, so gaining OEM approval to manufacture some parts is becoming more common,” Doherty stipulates.

Straub from SR Technics observes the aviation industry is transitioning between mature and new aircraft platforms. The new generation platforms have longer maintenance intervals and generally require fewer heavy maintenance checks. “This helps reducing the labour costs, but it is partly offset by more frequent cabin refurbishments and entertainment upgrades. More data is also available, which allows maintenance needs to be monitored and forecasted.”

On the other hand, Straub feels lower fuel costs have provided an opportunity for some operators to extend their fleet’s life cycle and defer

capital expenditure, prolonging the core traditional MRO work.

Airliners such as the A380 are now reaching 6-year heavy maintenance checks – an interesting period for the MRO market in terms of composite repairs.

“The composite structures are actually not much harder to maintain than aluminium alloy structures,” continues Straub. He says the repair techniques are more or less same as with old aircraft types. “However, if more extensive repairs are needed, the whole structural element might have to be replaced and a recovery team from the OEM could be needed, depending on the complexity.”



Doherty - Gaining OEM approval to manufacture some parts is becoming more common.
Photo: MAEL

Doherty adds that in terms of the younger new technology aircraft the maintenance programmes mean they tend not to see these aircraft in the hangar as early as would have typically seen with the older technologies. “We are doing far more concise inputs than we were used to with the 1C, 2C, 4C philosophy. Obviously with the enhanced use of composites aircraft damage presents a new challenge with new inspection techniques.”

Magnetic MRO is not dealing with A380 aircraft type(s) for the moment. But when it concerns new composite materials, the company is moving along with the developments actively. Shkolnik says: “Our dedicated composites workshop was designed to facilitate the most demanding repairs and the same goes for trained staff and tooling. We tend not to overinvest, but adapt to the actual needs.”

From a software systems perspective, Baugher notes that composite repair is fully supported within the overall repair framework. He says while different resources and methods apply to composite repair, the overall process can be managed using a modern and robust MRO software system workflow.



Sergei Shkolnik, Base Maintenance Director at Magnetic MRO

Israel Aerospace Industry (IAI) has the engineering and manufacturing capabilities on composite materials and is serving as one of Boeing’s 787 sub-contractors for composite materials parts manufacturing. Bedek, being a part of IAI’s enjoys this vast experience which has been accumulated among the IAI Group in the field of composite materials.

Technological advancements will no doubt have an impact on airframe MRO procedures. Baugher says that technological advancements in analysis, planning and automation systems can drive down overall requirements for heavy maintenance.



Narrow-body MRO spend will be significant.
Photo: Keith Mwanalushi

He explains that algorithms that identify Mean Time Between Inspection (MTBI), Mean Time Between Failure (MTBF), Mean Time Between Repair (MTBR), and Mean Time Between Maintenance (MTBM) can allow MRO organisations to perform predictive maintenance activities and reduce overall line and heavy maintenance visits. “With accurate data and advanced software tools in the right hands, airlines and MRO organisations are able to leverage investments in technology that flow directly to the bottom line of the company’s financial performance.”



Straub - Technology plays an important role in developing our maintenance operations.
Photo: SR Technics

At SR Technics, they are constantly reviewing processes to identify new and innovative ways to be more efficient, leaner and more competitive on the global market while maintaining high quality. “Technology plays an important role in developing our maintenance operations and in reducing cost while improving efficiencies and turnaround times. By using new technology and analysing big data, the turnover times for new aircraft types can be reduced compared to traditional aircraft types. Naturally, more complex cabin work and IFE upgrades require longer ground times, but if the work can be done in conjunction with maintenance checks, the ground time can be minimised,” tells Straub.

Over the next ten years, Oliver Wyman forecasts a significant shift of spend away from regional jets and turboprops and toward narrow-body aircraft. Narrow-body MRO spend will see a nearly \$21 billion increase to \$57 billion by 2027, with its overall market share rising to 52%. This share is taken almost entirely from regional jets and turboprops, as their combined share decreases to just 7% with a total MRO spend of \$7.4 billion. The wide-body MRO market share remains stable at 41% with a total market of almost \$45 billion by 2027.