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MRO

Maintenance predictability and planning software

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Planning for the unexpected

Efficient supply chain management requires sophisticated forecasting. In this report, *Keith Mwanalushi* finds that maintenance predictability and planning is a continuous operation.
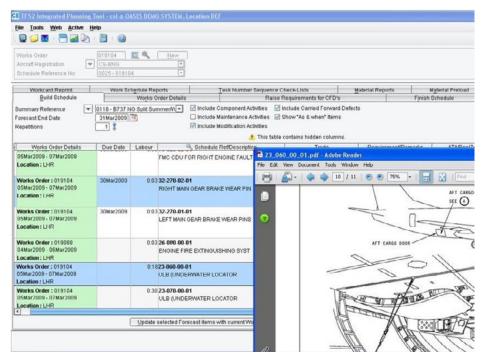
Aviation MRO software and IT Systems are now playing a vital role in maintenance predictability for aircraft operators. Forecasting is key to the efficient management of tasks, including supply chain management. Modern MRO IT systems, such as Commsoft's OASES, function in various ways to support this.

"The planning of scheduled tasks includes the generation of complex work scopes for routine and heavy checks, including the detailing of materials requirements at each individual task card level, allowing for required materials to be set aside in advance in preparation for checks," Nick Godwin, Commsoft managing director, tells AviTrader MRO.

Godwin reports that the various closed loop functions within purchasing, demands and RFQ functionality, allow multi-location, multi-owner-ship and multi-currency management of materials requirements and the quotation for parts from multiple vendors, also enabling the reporting and prediction of consumption and the recommendation of minimum stock levels. "This functionality can also automatically interface with web-based spares portals and with finance and accounting systems to enable efficient cost management with data errors minimised, also creating KPIs," he further explains.

OASES system by Commsoft.

Nick Godwin, Commsoft managing director.

With ever increasing flight schedules year on year, effectively addressing non-routine maintenance has become a way of life in turning around aircraft. "Hence, the need for foreseeing such recurrences into the future and planning accordingly, has become more relevant than ever," declares Ranganathan Jagannathan, senior vice president and SBU Head – Aviation Business, Ramco.

Ramco Aviation software has inbuilt controls and validations with logical process flows, that force maintenance crews to follow best maintenance practices, as prescribed by various authorities, without compromising on time said Jagannathan.

While several initiatives have been taken by OEMs and regulatory authorities, to reduce human error through automation of aircraft health monitoring and through intelligent maintenance procedures; Ramco has been keeping pace with these technological upgrades. "We recently partnered with Air France KLM E&M and the Singapore Government to inaugurate a one-of-a-kind MRO lab which will develop and test solutions," Jagannathan notes.

Aircraft operators are faced with a wide range of uncertainty when it comes to maintenance planning. Kirk Baugher executive vice president for business development at PENTAGON 2000 Software cites factors including flight plans, aircraft and component status, mechanic availability, tooling, technical information and materials all can impact an operators overall maintenance planning. "With a full featured and flexible tool such as Pentagon 2000SQL, operators can build a plan that is based on the known parameters and also run what-if scenarios to build contingency plans that can ensure the best possible chances to meet operational objectives," he says.

Arriving at an advanced supply chain forecast is only possible through the tight integration of the supply chain namely aircraft maintenance programme management, maintenance execution and fleet operations.

Andrew Floyd, product marketing manager at Mxi Technologies reckons that when done correctly with a software such as Mxi Technologies' Maintenix® solution, there are results from aircraft operators who have self-

disclosed the elimination of material delays for scheduled maintenance.

"It's no secret that maintenance predictability is one of, if not the most essential factor in running an efficient supply chain; facilitating on time and on budget part delivery," says Floyd. "The good news is that aircraft maintenance has some of the most advanced published forecasting available in many forms – from aircraft and major component maintenance programmes to mean time between removal or mean time between failure information of components."

The unpredictability of defects and non-routine maintenance is a whole other challenge that airlines have to contend with. In such situations, Maintenix for instance helps by fundamentally reducing the amount of these situations, through things such as granular configuration tracking control – leading to improved reliability and root cause analyses, fed back into maintenance programmes.

"For the remaining situations, Mxi recognises that rapid and cost effective return to service is paramount, and as such, Maintenix software helps by giving responders more time and more options to deal with the situation. Maintenix provides more time to react by allowing defect information to flow to all affected parties as they are experienced. This includes items found in-flight, through ACARS integrations, or found underwing during inspection and recorded on mobile devices," Floyd explains.

Floyd continues and says the cross departmental nature of the software allows maintenance personnel a single portal to access information needed to make correction decisions. "This information ranges from real-time part-tooling personnel availability, rob candidates including flight schedules, and deferral information to local vendor and borrow agreements. Information is available to everyone in the chain, be it technicians, engineers on the line, maintenance operations control, or supply chain personnel. Time traditionally spent triaging a situation and possible solutions can be spent conducting corrections instead."

Commsoft's OASES offers several features to reduce the impact of unpredictability. Non-routine and 'ad hoc' cards are easily gener-

ated in OASES, capturing all of the resources by skill sets and materials required for each unscheduled task. The costs associated with these can similarly be reported and fed into accounting systems for further analysis and prediction. The production module includes important functionality for managing and tracking hangar activity and this feeds data useful for future quotations which are closely modelled, learning from past resources activity and NRC or out-of-scope events. The costs for these non-routine activities are comprehensively reported.

"Operationally, Commsoft's OASES also features powerful reliability monitoring and reporting facilities, which can be used in conjunction with repetitive defects tracking to rapidly identify seemingly disparate removal or failure events across a large fleet operating in distant locations. This identification is critical to improving reliability and to campaigning out repetitive cost drivers. It also allows calculations of MTBUR," Godwin points out.

Airlines and MRO providers focus on MRO IT software where gains seem clear. So it's imperative for software developers explain and convince aircraft operators the business case for cutting maintenance costs.

"The business case for cutting costs is the simple notion of competing to win the business," states Todd Lewis, president at Component Control. "This is winning in terms of obtaining the business, winning the customer's expecta-

Floyd - Mxi has software solutions for both MRO providers, as well as aircraft operators.

in real-time to ensure that the lowest cost provider within the acceptable quality level is utilised. Labour costs can be lowered by optimising the use of skilled professionals across a given set of tasks and activities. Opportunity costs can be avoided or reduced by eliminating stock outages and delays in the repair process that keep aircraft and components out of service longer than necessary."

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Arguably, MRO organisations have better data systems than airlines. There seems to be opportunity for further cooperation between MROs and software providers to give aircraft operator's better control of cost and time.

tions, and winning the margin challenge. The question really is, how can you ignore the business case for eliminating waste in your processes?"

Maintenance costs are made up primarily of parts costs, labour costs, outside repair service costs and opportunity costs. Baugher says the Pentagon system allows operators and MRO's to save costs in each of these areas. "Parts costs and outside repair service costs can be reduced by use of advanced sourcing tools designed to connect to outside locator services

"Yes, this is happening now, and will continue to happen," Lewis agrees. He explains that one of the main differences between MRO organisations and operators, is the 'maintenance for profit' posture that the MRO organisations have.

"An MRO organisation may adopt lean logistics, paperless work flow, analysis of process intelligence metrics, as a matter of survival, so they do it first. Operators have the same objectives in terms of cost efficiencies and turn-around performance, so they tend to

follow the best practice adopted by the MRO folks," Lewis says.

While, MRO organisations may have better data systems than airlines, Jagannathan from Ramco sees that with increasing focus on safety, cost reduction, operations streamlining and meeting regulatory mandates, MRO players as well as airlines are no longer able to address the changing business needs, with their conventional software.

"The opportunities for MROs and airlines through early adoption of emerging industry and technology trends are multi fold and stands as a true testament to our future-ready offerings," Jagannathan indicates.

The recent partnership between Ramco and Air France KLM E&M for the MRO Lab is a standout example. "With budding partnerships such as these, we foresee a more unified ecosystem for aviation maintenance and reduction of costs.

Kirk Baugher says aircraft operators face a wide range of uncertainty when it comes to maintenance planning.

"Consequently, we can also expect a significant improvement in the functionality of these machines with better safety measures, in place. Through secure exchange of data, Ramco envisions a future in which a common platform will bring key players in the industry to co-exist (OEMs, MROs, operators and third party solution providers) in order to drive supply chain efficiencies, productivity improvements and customer satisfaction," the

Ramco SVP said.

In today's connected world, there are still vast areas of disconnected systems and paper or spreadsheet based automation. Duplicate activities and errors from re-keying data are common. Baugher feels MRO IT Software providers that can rapidly deploy system-to-system interfaces are becoming the glue that bonds trading partners together. "Managing the materials supply chain is a complex undertaking, and automating repair service and component exchanges can be a daunting task for an individual company."

TracWare Aviation MRO Software does not have any airline customers, but many of its customers are either MRO's supplying to the airlines or are operators of aircraft – particularly rotor-wing which are not necessarily subject to the same rules as airliners, but are equally (if not more) complex.

The ability to forecast for materials requirements is a crucial but standard part of the material planning functions of TracWare's flagship aviation MRO process control software - AeroTrac™. "Aerotrac allows for the setting of conventional minimum and maximum levels that can be calculated based on usage and other algorithms," states Patrick Waker maintenance planning software at TracWare.

"This is typically the method used to manage standard parts, or other materials that are defined as belonging to a 'kit', and can be called up automatically during scheduled maintenance. In this sense, maintenance predictability is less of an issue as these parts tend to be readily available on the market."

Waker says the material planners also make use of the maintenance forecast functions to forecast which components will require replacement with a defined period based on a combination of hard-time calendar dates and averaged flight-hour cycle utilisation. "These parts are typically more expensive, can be repaired or overhauled and have longer lead-times, so maintenance predictability is crucial, both from an airworthiness and cost-management viewpoint. AeroTrac allows for planned ordering of these components – or at least as much as lead-times and cash-flow allow," he adds.

In practice, the MRO provider is trying to maximise its margins by controlling the costs of production in relation to the quoted costs for scheduled tasks and by also charging the air-

Ranganathan Jagannathan, SVP and SBU Head – Aviation Business at Ramco

line the maximum justifiable for non-routine activities as Godwin from Commsoft says: "The airline in presenting the scope of scheduled tasks to the MRO, is seeking to minimise these margins and expenses to reduce the overall maintenance costs, effecting detailed oversight of the tasks. As such, the airline and MRO can be viewed as being horizontally-opposed in their goals, despite using similar functions in the software for different purposes."

For operations, Godwin is adamant that OASES offers comprehensive maintenance costs reporting and tracking by detailed elements, with new developments to be offered in 2016 to accurately budget, forecast and control costs by category. "OASES also includes extensive transaction tracking and auditing facilities. The planning and forecasting capabilities in systems such as OASES are vital to enabling the extensions of intervals and the reductions in work content allied to enhanced reliability and efficient materials' usage to drive costs down. The key is timely and more accurate data, enabling decision support tools," Godwin sums up.