ESSENTIAL

INTERFACE

Maintenance planning and scheduling software has developed in recent times to better account for the interface between the CAMO and the MRO, enhancing efficiency and safety, says *Mario Pierobon*

Illustrations: **Phil Couzens**

The interface between the continuing airworthiness management organisation (CAMO) and the maintenance, repair and overhaul (MRO) company is a critical one to ensure the efficiency and safety of both airworthiness management and maintenance operations. Lately, maintenance planning and scheduling software has developed to better facilitate the interface between the CAMO and the MRO.

According to Daniel Tautges and Shaun Polley, respectively senior vice president and senior sales and implementation engineer at Component Control (developer of the 'Quantum Control' ERP software), the integration between CAMO and MRO is essential. "A link between the two areas reduces the risk for data entry areas and provides the ability to accurately forecast maintenance and analyse trends," they say.

Swiss AviationSoftware's (Swiss-AS) product owner Ana Malešević comments: "With CAMO being responsible to keep the aircraft airworthy and the MRO performing the maintenance on the aircraft, it is of great importance that these two major elements of the continuing airworthiness concept have a fast, reliable and effective way of ensuring safe operations."

The CAMO-MRO arrangements foresee that the CAMO side schedules maintenance and then the MRO side is responsible for executing it, highlights Dave Purfurst, global pre-sales director at Rusada. "The MRO side in return also discovers unscheduled maintenance, which is reported back to the CAMO side, who then instruct whether to perform or defer," he says. "The data collected by both sides helps the other

1. Software that handles CAMO activities and MRO maintenance is crucial for many aviation operations
2. WinAir has both CAMO and MRO products built into its software

THE EXCHANGE OF DATA BETWEEN OPERATORS AND THIRD-PARTY MROS HAS ROOM FOR IMPROVEMENT

work more accurately and efficiently, so it really is a two-way relationship where neither side can successfully operate without talking to the other."

As one of the most complex industries where any discrepancy can directly impact flight safety as well as financial aspects, it is not surprising that aviation is also one of the most technology intensive sectors, observes Malešević. "AMOS software helps users by simplifying their CAMO and MRO processes through high level integration by bringing transparency and quality of work to the highest level for both organisations, all while reducing costs and supporting optimisation of available resources," she says.

Indeed, software that handles CAMO activities and MRO maintenance is crucial for many aviation operations, according to Emilio Castro, product

specialist at WinAir. "Our software handles CAMO and MRO maintenance tasks in a single software solution that seamlessly interfaces and transmits data in one product," he says. "When one is operating with a fleet of aircraft, one requires information at their fingertips, which is why managing maintenance records on spreadsheets does not meet the threshold for what can be considered ease-of-access.

"Without a CAMO-MRO interface, there is a high likelihood that the business will expend significant time tracking and managing maintenance records and maintenance tasks by manually having to re-enter information into two dissimilar systems that do not share information."

Currently, a high percentage of third-party MRO service providers manage their workscope input in PDF

format, says Saravanan Rajarajan, director of aviation solution consulting at Ramco Systems. "It is quite likely that they will receive the package one or two weeks before the aircraft's input. Dealing with varying package content types and formats generated from the airline's respective MRO systems poses considerable challenges," he says. "The challenges include listing the task information and checking the internal data for a possible match and creating task cards in the MRO system if a match is not available.

"Another challenge is listing the part information to check the part nomenclature and stock availability and creating a part record if the former are not available. In addition, extracting and auditing the tools' availability and planning for the overall manpower requirements and matching the task with the task cards if they are provided separately and if they are not downloading task cards from OEM site are also challenges."

IT IS NOT TOO SURPRISING THAT AVIATION IS ONE OF THE MOST TECHNOLOGY INTENSIVE SECTORS

Interface functionalities

The complete process of exchange of information between the CAMO and the MRO can be digitised starting from the initial work package – with the subsequent revisions – until the work completion update, affirms Rajarajan. "Technical requests from the MRO requiring the airline CAMO feedback are embedded within the ecosystem workflow," he says. "Having all the interactions within the system framework enables the institutionalising of the knowledge and deriving the intelligence using advanced artificial intelligence and machine learning (AI/ML) tools."

The CAMO data provides the maintenance intervals and due list items, such as routine and airworthiness directives and service bulletins. The MRO functions provide the shop floor activities, such as bill of material management, tooling, labour estimate, direct labour recording and quality functions, including multi-level sign-off, highlight Tautges and Polley. "All of the above are embedded directly into Quantum Control," they say. "This allows the CAMO to schedule and launch the maintenance activities. This integration allows the CAMO to provide the hangar with all of the templated details for the selected maintenance."

With AMOS's 'Transfer MRO Workpackage' and 'Transfer MRO Results' interfaces, users have a way to exchange work packages and work order information between CAMO and MRO organisations, says Malešević. "Work packages are exported from an operator IT system and imported into an MRO IT system that might be in either or in both cases AMOS," she says. "This allows an easy and progressive transmission of work package information to the MRO as well as reading back of the work performance and finding data from the MRO."

According to Purfurst, the ideal solution is to have both CAMO and MRO functions managed by one solution. "As so many processes and data points are exchanged between them, one can only achieve maximum efficiency by having these fully integrated. In 'ENVISION', both sides have live visibility over the progress of work packages and work orders through various dashboards and reports," he says. "This visibility is vital for planning as the CAMO side has a clear view of hangar capacity, available resources and current unscheduled maintenance. Meanwhile, the MRO side has an accurate pipeline of work coming their way and can plan accordingly."

WinAir has both CAMO and MRO products built into its software. "Businesses can use the features and functionalities that best align with their current requirements, then boost their software package by adding new items as these needs change," says Castro. "If a business uses a separate CAMO or MRO product in conjunction with WinAir, they can import that information into the software via structured data exports. We have built-in data import and export tools, which makes the transfer of information a straightforward process."

1. WinAir's software as displayed on a tablet
2. The process of exchange of information between the CAMO and the MRO can be digitised
3. In Rusada's 'ENVISION', both sides have live visibility over the progress of work packages and work orders through dashboards and reports
4. With new technologies, maintenance planning and scheduling software is constantly evolving

Enhancing interface efficiency

According to Purfurst, the area in the CAMO-MRO interface that has the most room for improvement is the exchange of data between operators and third-party MROs.

"Many have moved away from transferring records via paper, but the practice still exists. To be more efficient, organisations must look to electronic interfaces for the transfer of data," he says. "These however can still present problems as there is no one format for these records to reside in. This means a maintenance provider could have different task card formats for each of their customers, making it very hard for them to attain maximum efficiency."

Tautges and Polley affirm that there is room within the Quantum ERP that can generate additional capabilities and efficiencies on top of CAMO when implemented. "As maintenance intervals and due lists are generated or forecasted, the ERP provides a demand forecast for requirements around parts and labour requirements.

"This demand forecast is used to create detailed work plans and scope, as well as integrate with capacity planning processes and systems," they say. "Quantum automatically downloads job cards associated with aircraft

THE DATA COLLECTED BY BOTH SIDES HELPS THE OTHER TO WORK MUCH MORE EFFICIENTLY

maintenance. Once completed, the job cards and work performed automatically updates the CAMO to log the maintenance records of the aircraft."

Swiss-AS's plan is to further improve data exchange efficiency between the CAMO and the MRO by introducing 'AMOScentral' and spanning a virtual cloud over all AMOS instances. "This will allow each AMOS customer to individually open its platform to collaborate to the desired extent with other members of the AMOS community and beyond," says Malešević.

With the CAMO-MRO electronic data interchange (EDI) interface in ATA SPEC 2000 Chapter 18, the job cards can exchange data in EDI format across organisations, observes Rajarajan. "A right EDI strategy enables seamless exchange of data, reducing the time to push it to production, the

ability to manage the revisions between successive work scope changes, reducing errors and finally the ability for the mechanics to perform their jobs digitally from their place of work, thereby gaining significant operational efficiencies and real-time tracking of work progress," he says.

As for future efficiencies, there is also the potential for timely task and access panels sequencing, automatic assignments of the rostered staff with the right skills to tasks and non-routines, proactive identification and mitigation of bottlenecks due to capacity, labour, parts and tools, affirms Rajarajan. "The feedback loop from MRO to CAMO systems provides the complete visibility on the work progress and automated update of compliance and work execution details, thereby improving the efficiencies of both the MRO and the CAMO," he concludes. ⓜ