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MRO

Management

A changing landscape

Exploring the regional
aircraft MRO market
p.40

ONE-STOP-SHOP

A look at the impact of
Embraer's OGMA plant

p.26

LEGAL MATTERS

Remote Authorised Persons and
Canadian aerospace growth

p.20

INDUSTRIALISING REPAIRS

How GE is improving the
lifecycle of parts

p.34

UNRAVELLING SUPPLY CHAIN COMPLEXITIES

Mario Pierobon speaks with *Saravanan Rajarajan*, director of aviation solution consulting at Ramco Systems, to assess the complexities of aviation MRO and the role of tech, the key touchpoints for supply chain management systems, and what the software of the future will look like

Aircraft maintenance, repair, and overhaul (MRO) sourcing grapples with a multitude of complexities while locating the parts. At the same time, software can enable efficient management and coordination of complex supply chain activities involved in aircraft MRO.

Multiple factors

Aviation MRO complexities are due to multiple factors surrounding the aviation parts and parties, namely the suppliers, MRO organisations and shippers involved in the supply chain, explains Rajarajan.

“These factors are usage, failure rates, maintenance policies, parent equipment, operating conditions, multi-nodal inventory, trade restrictions, regulatory controls, limited sourcing options and lead times, alternates, modification statuses, configuration effectivity, interdependencies and deviations,” he says.

“In the future, SCM software will have a larger ecosystem to process data from the supply chain”

“Aviation software enables the critical visibility of parts and stocks in the supply chain. Organisational visibility must be expanded outside the warehouses, which includes items in transit, under receiving, under quarantine, due from the supplier or due for repair. Ramco has the global visibility of items separated between serviceable and unserviceable, considering the alternates for the part in demand.”

By enabling collaboration and data sharing in the ecosystems, the visibility of stocks is extended outside the organisations, says Rajarajan.

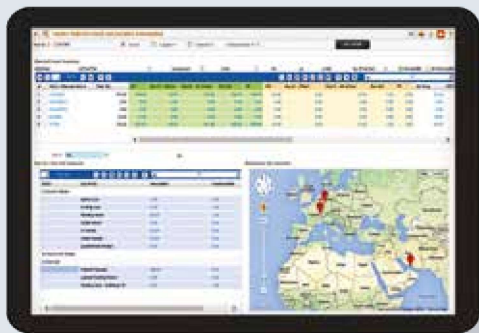
He explains: “Our Supply Chain module has SPEC 2000 adapters for procurement and repairs with the

availability of the parts from registered suppliers. Data links can be extended to other partners such as airlines, original equipment manufacturers (OEM) and marketplace to receive stock availability, turnaround time (TAT), and item certifications on demand or at a scheduled frequency. All data are processed and displayed for the user in a screen showing external part availability to support decision-making.”

Software key touchpoints

The digitisation of the supply chain enables aviation MROs to be more agile, accurate, granular and efficient, according to Rajarajan.

“For increased agility, supply chain management (SCM) software must be capable of ad hoc and real time planning for changing supply and demand situations. Planning cycles are minimised and become a continuous process to reach dynamically varying demands and constraints,” he says.



2

“For instance, our Float computation and optimisation module leverages data and machine learning algorithms to forecast the float requirements and the best possible option for managing the service level agreement. Data on the supply chain, part engineering and reliability are processed together to arrive at solutions ranging from driving reliability, TAT, replenishment or purchases.”

Next-generation analytics provides increased accuracy and granularity, thanks to real-time, end-to-end transparency throughout the supply chain, enabled by robust data interfaces with tracking systems and electronic data interchange (EDI) interfaces, adds Rajarajan.

“High-value parts moving in the shops are tracked through radio frequency identification (RFID) and processed through SCM software to determine



3

“The digitisation of the supply chain enables aviation MROs to be more agile, accurate, granular and efficient”

wait time and optimise the routes. In our software, third-party adapters enable locating the parts’ physical location. This information is processed and rendered graphically in the Route Anywhere mobile application,” he says.


The automation of physical and software tasks also boosts efficiency in supply chain management, adds Rajarajan.

“For example, the parts removed from aircraft are tracked through RFID until they reach the unserviceable unit processing location where automatic storage and retrieval systems for physical storage handle them. The software does the screening and takes over the disposition of the unit automatically,” he says.

“Based on the availability of reliability and overall float requirements, the decision is taken to either repair the unit, thus replenishing the number of serviceable units, or keep the unit on parking to conserve costs. Once deemed for repair, based on the automation rules and supplier contract, the entire repair order process is automated in the software.”

Future supply chain software

In the future, SCM software will have a larger ecosystem to process data from the supply chain, starting from suppliers, customers, warehousing systems, logistics carriers, customs agencies and regulatory agencies, says Rajarajan.

“Software will gain the intelligence needed to assist decisions or even automate transactions based on frequency and criticality. We are embedding more use cases through co-creation with our customers to bring decision-assist capabilities by leveraging data and machine learning (ML) platforms. We are working with a consortium led by SITA on the blockchain to be part of the network. Currently, we are carrying out the focused proof of concept on the advanced part exchange between the network participants,” he adds. 



1

1. Float analysis and review
2. Inquire material count and location information
3. Next-generation analytics provides increased accuracy and granularity