MRO AND M&E SERVICE PROVIDERS

Despite a fiercely competitive market environment, the MRO/M&E industry offers growth opportunities for providers who can manage their service operations as a strategic line of business to generate the greatest possible revenue at the lowest possible cost. SAP® for Aerospace & Defense offers a complete set of solutions by integrating all your critical business processes into a single information platform, from maintenance engineering to planning, operations, and service parts management.

Industry Trends and Opportunities

Several challenging trends are shaping the future of the aerospace maintenance, repair, and overhaul (MRO) and maintenance and engineering (M&E) industry sector, which has experienced significant economic turbulence since the September 11, 2001 attacks on the United States. Terrorism, SARS, and a general global downturn have resulted in decreased airline revenues. New business models, including those deployed by low-cost carriers and regional airlines, and the proliferation of smaller, narrow-body aircraft, are putting additional economic pressure on traditional airline carriers, and are expected to drive future growth in MRO demand.

Original equipment manufacturers (OEMs) have entered the after-sales market to create new revenue streams – and as a result, an airline's internal M&E organization often competes against third-party MRO providers to provide the lowest-cost service. In fact, external MRO vendors account for 50% of all maintenance work performed today, a figure that is expected to grow quickly.

Although deregulation of the aviation industry forced airlines to begin focusing on their core competencies decades ago, they must now do so with even greater urgency. To remain competitive, airlines must either outsource their M&E work or run their internal M&E organizations as separate, strategic business units, insourcing additional work from other airlines.

Consolidation in the MRO/M&E market will continue to gain momentum, and will be further compounded as customers reduce the number of suppliers they deal with. Focus on the MRO customer will increase as the trend toward customized total care packages grows, requiring MRO providers to shift from managing products to managing contracts.

Even though there is currently an excess of capacity in the market, a shortage of skilled engineers is expected over the next decade as aging engineers retire. Maintaining new aircraft fleets requires new skill sets. As a result, employee productivity, training, education, and human resource management will play an increasingly important role in the future.

Despite these challenges, potential for opportunity in the MRO/M&E industry is promising. It is estimated that the world fleet will grow by 60% over the next 10 years and the MRO global market will grow by US$4.8 billion over the next 5 years.

As an MRO/M&E service provider, you know you must increase the productivity of your existing workforce and bring new staff up to speed as quickly as possible. Here are a few questions you should be asking yourself:

- Can your organization stay independent as competitors consolidate?
- Do you know the true cost of the goods purchased by your organization?
- Is excess inventory costing you money?
- Does your current system provide you with the right level of detail to improve your maintenance production processes?
- Can you identify the bottlenecks within your M&E organization that affect the dispatch reliability of the aircraft you maintain?
- Is your current system ready for e-business?

SAP for Aerospace & Defense for MRO/M&E Service Providers

The SAP for Aerospace & Defense (SAP for A&D) set of solutions can support your line maintenance, heavy maintenance, engine maintenance, and component repair processes. SAP for A&D is the right choice for you whether you are in the service business, sell M&E services to your customers, or maintain your own fleet of aircraft.

The SAP for Aerospace & Defense solution map for MRO/M&E service providers helps you to understand the benefits and value these solutions deliver, and includes the following business scenarios:

- The heavy maintenance scenario is for heavy maintenance of aircraft and engine overhauls and component workshops.
- The line maintenance scenario is for service performed by line and service stations during aircraft layovers.
- The component maintenance scenario (also called shop maintenance) consists of repair, overhaul, or refurbishment of components or major assemblies that have been removed from the aircraft.

The SAP for A&D solutions can help you run your business better in the following areas:

- Maintenance engineering
- Maintenance planning
- Maintenance operations
- Service parts management

Maintenance Engineering

Manufacturers of aircraft, engines, and components provide various technical publications for their products (for example, aircraft maintenance manuals [AMM], component maintenance manuals [CMM], and maintenance planning documents [MPD]). These documents can be stored and referenced throughout the entire maintenance process. Depending on the manuals received from manufacturers and the experience of your maintenance organization, you can create flexible maintenance plans for air-

craft, engines, and life-limited parts in the system. You can also archive and store service bulletins (SBs), service letters, and similar documents from airframe, engine, and component manufacturers, as well as airworthiness directives (ADs) from national aviation authorities. This enables your maintenance engineering department to evaluate the applicability of the documents to the fleet and to prioritize the implementation for the specified serialized components. Work instructions for applicable SBs and ADs can be prepared and released prior to the implementation.

Identifying and controlling the configuration of a complex machine like an aircraft or engine is essential to ensure airworthiness throughout its entire life cycle. With SAP for Aerospace & Defense, you can document all the components of an aircraft once the parts are identified. This includes part numbers, serial numbers, life limits, performance measures, service bulletin status, and so on. You can plan for and track changes to the configuration based on line maintenance and base maintenance throughout the aircraft's life.

Maintenance Planning

SAP for Aerospace & Defense gives you unparalleled control over your maintenance schedule. Forecasting tools enable you to plan and prepare for anticipated visits, allocate hangar space, assess work center capacity, and identify component availability. You can identify potential bottlenecks early on, enabling you to make necessary adjustments quickly and meet your deadlines.

Using maintenance plans and the performance and condition data of your aircraft, you can plan and schedule preventive maintenance to minimize downtime and lost revenue. The maintenance control center can also use aircraft performance (for example, flight hours and cycles) to plan schedules and work packages. In addition, you can monitor deferred items – the result of previous line station or hangar visits or a problem that could not be fixed at the time of repair and had to be rescheduled for a later date.

Once scheduled maintenance and open or deferred items that are due have been identified, you can combine them into work packages, which are then dispatched to the line stations (for smaller packages) or to base maintenance.

The integrated project management system helps you plan larger maintenance events. You can outline major maintenance activities and set important milestones. This project plan then serves as the rough schedule for the maintenance event.

Maintenance Operations

With SAP for Aerospace & Defense, work orders (or job cards) are generated based on the defined work package for the aircraft and are scheduled according to the project plan. Your engineers can perform routine work as described in the maintenance plan, and you can identify and track modification alerts in service bulletins. You can integrate work that arises from discrepancies identified during inspection into the project, and you can assign new responsibilities and reserve the appropriate resources.

The handling of materials throughout the execution of the work is also crucial. With SAP for A&D, you can track serialized and batch-managed materials and manage complex ownership situations. You can also monitor services that have been outsourced. When services are completed, confirmations and the movement of goods are recorded, and you can process invoices and payments.

Production data, such as labor confirmations and goods movement, is continuously collected. This enables real-time status checks and responsive management. Once the work is finished – or if it is interrupted – you can record the status of the job. Authorized staff on the shop floor sign off on the work done by the mechanics to indicate the work is considered to be technically complete. Outstanding work may need to be deferred to future line station or hangar visits. Actual and forecasted costs, as well as progress, are monitored against the original and current plan.

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Service Parts Management

SAP for Aerospace & Defense offers accurate tracking of your inventory, whether it resides in warehouses, hangars, or line stations. Based on the past use of components, you can forecast your future requirements, and you can procure components according to chapters 1 to 4 of the SPEC 2000 standards. A rotable management application includes functions for tracking rotables during their life cycles, whether they were installed in an aircraft, stored in a warehouse, or serviced in a workshop. Other features include tracking operational usage status, modification status, warranty and service or maintenance history, and more.

SAP's Commitment to MRO and M&E

SAP is committed to the aerospace and defense industry. Our goal is to:

- Provide a solution for MRO and M&E service providers: SAP for Aerospace & Defense
- Work with MRO user groups to refine solution requirements, share experiences gained from the installed base of users, and drive product development
- Develop best practices by working closely with MRO and M&E service providers, third-party vendors, and software partners

For more information on SAP for Aerospace and Defense, please visit **www.sap.com/aero-defense**.

Powered by SAP NetWeaver™

The SAP for Aerospace & Defense set of solutions are powered by the SAP NetWeaver™ platform, the open integration and application platform that enables change. SAP NetWeaver helps companies align IT with their business. It allows companies to obtain more business value from existing IT investments and to deploy a services-oriented architecture. SAP NetWeaver reduces total cost of ownership (TCO) and complexity across the entire IT landscape.

SAP NetWeaver powers mySAP™ Business Suite, SAP® xApps™ packaged composite applications, and partner solutions. It provides the best way to integrate all systems running SAP or non-SAP software. SAP NetWeaver unifies integration technologies into a single platform and is pre-integrated with business applications, reducing the need for custom integration.

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