

SAP Customer Success Story Aerospace & Defense – Manufacturing



“The interaction between the SAP R/3 software and MES has considerably improved transparency in production . . . we are continuously improving machine availability and productivity.”

Michael Keller, Head of Rotor/Stator Production, MTU Aero Engines GmbH

AT A GLANCE

Summary

In the drive to improve its manufacturing operations, leading German engine maker MTU Aero Engines GmbH decided to integrate SAP® R/3® software with a manufacturing execution system (MES). The resulting integration increases transparency in the firm's production and contributes to continual improvements in the availability and reliability of machinery.

Web Site

www.mtu.de

Key Challenges

- Capturing real-time data from 300 machines with heterogeneous machine control and sometimes different production processes
- Establishing an end-to-end process – from the machine to the enterprise resource planning (ERP) system

Project Objectives

- Increase productivity by using total productivity management
- Improve the transparency of orders and costs in the ERP system based on SAP R/3 software (functionality now found in the mySAP™ ERP solution)

Solutions and Services

- SAP R/3 software
- FACTORY FRAMEWORK by FORCAM GmbH

Why SAP Solution

- Seamless integration possible with MES
- Potential for implementing other SAP solutions for further efficiencies

Implementation Highlights

- All 300 machines in the 60 production lines were integrated in 12 months.
- Maintenance orders are created in the MES and automatically sent to the SAP system.

Key Benefits

- Unplanned downtime is automatically identified and recorded for the statistics.
- Machine availability and productivity are continuously improving.
- Transparency in production has increased considerably.
- Condition of all important machines can be displayed online.

Implementation Partner FORCAM GmbH

Existing Environment

- SAP R/3 software
- SAP Business Information Warehouse component, functionality now found in the SAP NetWeaver® Business Intelligence component

Database

Oracle Standard Edition

Hardware

- Universal Ethernet MDE Box from WAGO (for collecting digital information from the machines)
- PCs with Web browsers

Operating System

- Microsoft Windows XP clients
- Microsoft Windows 2003 server
- VMWare

MTU AERO ENGINES

Engine Maker Optimizes Production Planning and Control by Integrating Shop Floor with Its ERP System

To build on its leading position, MTU Aero Engines GmbH – Germany's leading engine manufacturer – participates in international cooperative efforts and deploys the latest IT technology on a wide scale. Since a high proportion of production takes place in Germany, manufacturing costs are a critical aspect of MTU's success. In addition to keeping an eye on costs, the company is always seeking to exploit any potential for improvement. To this end, in January 2002, MTU began using SAP® R/3® software as the enterprise resource planning (ERP) system to centrally plan schedules and material requirements (SAP R/3 software functionality is now found in the mySAP™ ERP solution). MTU then identified further potential for optimizing the integration between the shop floor (production) and the top floor (ERP system).

“We wanted to increase the availability and reliability of our production machines,” says Dr. Michael Süß, COO at MTU. “We knew total productivity management [TPM] could raise productivity and improve the transparency of orders and costs in the SAP R/3 software.” To implement TPM, MTU needed to capture real-time data from 300 machines with heterogeneous machine control and sometimes different production processes at its Munich site. This challenge required an end-to-end process – from the machine to the ERP system.

MTU: Propulsion for the World

MTU Aero Engines develops, manufactures, and repairs engines for military and commercial airplanes and helicopters. MTU's customers manufacture and operate aircraft and industrial gas turbines around the world. MTU München was founded in 1969, following the merger of MAN Turbo and Daimler-Benz.

At the end of 2003, MTU was acquired by the U.S. private equity company Kohlberg Kravis Roberts (KKR). In fiscal year 2003, MTU Aero Engines achieved revenues of €1.9 billion. It has 8,000 employees, of which 5,200 work at its site in Munich, Germany.

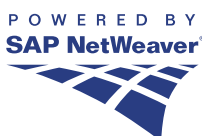
Project Remained on Schedule and Within Budget

MTU needed a manufacturing execution system (MES) to seamlessly connect the machine control level with plant maintenance and production planning in the SAP system. MTU analyzed the market and, in May 2003, decided on FACTORY FRAMEWORK from FORCAM GmbH. The project managers had several objectives, which included a high level of integration between the MES and the existing SAP environment, seamless process chains (from the SAP software to the engine), references with similar project requirements, configurable standard solution, decoupling of the technical interface from the human interface, and implementing a browser-based application for TPM analyses.

The implementation began with a pilot phase for two production lines in which the key users were heavily involved. This enabled MTU to gather the first information about the signals emitted by the machines and rule out the risk of system downtime. The experience gained during the pilot phase was incorporated into the rollout. "Twelve months later all 300 machines in 60 manufacturing lines were integrated as planned and went live with the new system," recalls Axel Mattschas, who is project lead and the manager responsible for digital production systems at MTU. Machine operators and engineers, managers, and logistics specialists all create reports from the data captured from the machines, and all MTU employees affected by the project received training while the implementation was going on.

Machine Data in Real Time

Connecting the MES with the SAP system is already paying off for MTU in many ways: data from the 300 machines is now automatically captured in real time. As a result, MTU can promptly identify and evaluate weaknesses (for example, when a machine goes down) and trigger countermeasures. Staff can then use reliable key figures on machine efficiency (taken from unchangeable machine status signals) and monitor the effectiveness of the actions they take.



The MES is seamlessly integrated with the ERP functions for plant maintenance and production planning. Consequently, if there is a technical problem, maintenance orders are created in the MES and automatically sent to the ERP system. Data from production orders and task list operations is also transferred from the SAP R/3 software's planning system to the MES – to link the orders with the status of the machines and evaluate them. "The interaction between the SAP R/3 software and MES has considerably improved transparency in production.

"We knew total productivity management could raise productivity and improve the transparency of orders and costs in the SAP R/3 software."

Dr. Michael Süß, COO, MTU Aero Engines GmbH

Unplanned downtime is now identified immediately and recorded for the statistics. In this way, we are continuously improving machine availability and productivity," says Michael Keller, head of rotor/stator production at MTU. "We now have up-to-date information about production and loss times and can display the condition of all important machines online." Another benefit is that the 700 users in production can interact with the MES. Users can choose between the ergonomic menu-based interfaces on the standard PCs and touch screens. Moreover, users can display and evaluate the operating status of the machines online at any of the PCs in the network.

Next Steps

In the first phase of the project, MTU successfully implemented TPM and machine data entry. "Now, we want to create order rule cycles involving SAP solutions," states Mattschas. "Then, we'll implement a production planning and control system with the SAP Advanced Planning & Optimization component." MTU also plans to introduce a dashboard for end users based on the SAP NetWeaver® Portal component. By using these additional SAP solutions, the company expects not only to further reduce lead times and distribute the load on production more evenly but also to avoid order peaks and unplanned bottlenecks. With SAP as a software partner, MTU can look forward to greater efficiencies as it continues to optimize its processes.