Featured Industry: Aerospace and Defense

XMC® Speeds F-22 Aircraft Manufacturing Process by Enabling Overall Equipment Effectiveness (OEE)

Nowhere is precision more important than in the United States Air Force. Similarly, it takes precision manufacturing techniques coupled with exceptional expertise to produce the jet aircraft that are the foundation of the program.

That expertise is found at one of the Air Force's major suppliers, which manufactures critical subassemblies of the F-22 "Raptor" — the most advanced fighter jet in history.

Like manufacturing organizations everywhere, this leading supplier is under pressure to streamline processes, lower production costs, and improve the performance and utilization of their critical machining assets. Seeking assistance, this supplier partnered with ROY-G-BIV Corporation, a provider of machine tool connectivity and productivity solutions for aerospace and defense manufacturers.

ROY-G-BIV conducted its comprehensive Factory Audit™ of the site's key processes, most of which involved critical CNC machine tools for manufacturing composite parts. The audit revealed several opportunities for process and machine utilization improvements. Armed with a compelling business case, senior site leaders endorsed ROY-G-BIV's proposal for an "Enhanced" OEE (Overall Equipment Effectiveness) initiative to give production and maintenance teams detailed information needed to implement and measure new lean manufacturing principles across their key machining areas.

The first target was one of the supplier's major F-22 subassembly production lines, specifically the precision drilling machines that mark, drill and inspect thousands of holes in large composite parts.

"In order to meet production schedules, we needed to drive down our takt time (the time it takes to make a complete subassembly)," said the industrial engineer who plans the machine production schedules. "We had to progress; we had to get better. One way to do that was to have an accurate understanding of what was really going on with our critical production machines."

They had previously tried to use OEE information largely derived from manual data input, but the data was notoriously biased and unreliable. Plus, it was taking machine operators as much time to input the data as it was to do their job.

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Needs

A way to accurately collect performance data about critical machining assets to identify, implement and measure the business benefits of lean manufacturing improvements.

Solution

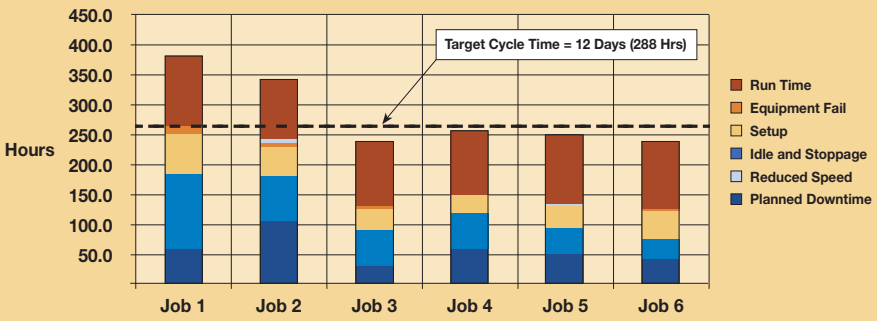
XMC provides a machine connectivity platform for the entire factory, linking critical machine tool data with existing factory management and visualization systems for more accurate, reliable and valuable data-driven manufacturing.

ROY-G-BIV's "Enhanced OEE" solution is a comprehensive program for improving machine utilization, availability and performance. It includes a factory audit to assess critical machines and identify opportunity areas, expert technical service to 'enable' machines with XMC software, and a proven methodology for using "Enhanced" OEE data to increase critical machine productivity and business profits.

Benefits

XMC helped this manufacturer realize:

- 23% increase in drilling machine OEE
- 25% increase in drilling machine capacity
- Less than 2% of unplanned downtime from machine breakdowns
- A foundation for usage-based machine maintenance
- A break-even ROI in less than three months



Enter ROY-G-BIV's XMC® solution. "Using the XMC software platform and the XMC Data Router™ product, we are now able to collect an array of machine and process data, then feed it to our existing web-based OEE system," said the site's Enhanced OEE initiative representative.

"XMC automatically and more accurately gathers data from a wide range of our machines' CNC controls, giving us new visibility into our legacy hardware as well as our newest machine tools. XMC allows us to 'talk' to our different machine tools in a common way, which makes analyzing data from each different machine so much easier. This ultimately allows our OEE and manufacturing intelligence software to truly work with our broad range of CNC machines, which are some of the most critical capital assets in the plant."

After XMC was installed, it took less than two weeks to determine baseline OEE ratings for each machine and identify major machine efficiency problems — a task that can take months using manual data collection. ROY-G-BIV then employed their Enhanced OEE™ continuous improvement methodology to help the team analyze and use this data at weekly team meetings.

The results have been dramatic. Average drilling machine cycle time dropped 32 percent as average OEE increased from 35 percent to 58 percent in less than three months. The team is now able to process 25 percent more, or roughly $3 million, in parts annually on the existing drilling machines.

It's also been a boon to the machine maintenance area. "XMC allows us to access key machine data needed to implement an autonomous, usage-based maintenance program," said the first line production manager. "This new system gives us a much better understanding of when we actually need to service the machines."

XMC and the Enhanced OEE initiative also helped the site earn the highest rating across the entire company for Total Productive Maintenance (TPM) activities, and Enhanced OEE is an enterprise-wide best practice for asset utilization.

"I believe all our production facilities could benefit from having a system like this and I'm pleased that we've been the benchmark here," said the Enhanced OEE site representative. "We're doing things that people in the industry have been trying to do for a long time."

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"These Enhanced OEE efforts are the best and most proactive I have seen across the enterprise — an outstanding effort."

F-22 Program Manager
Manufacturing Operations

"The results of the Enhanced OEE initiative have been terrific, particularly in managing machine uptime and predicting potential problems. Our [F-22] customer is extremely pleased and we are thought of by most as an enterprise leader in TPM as a result."

Senior Manager,
Equipment Maintenance
Services

"It's very time consuming for an industrial engineer to go out and accurately track what a machine is doing on a daily basis. What I'm seeing with this system is just phenomenal."

Industrial Engineer,
Drilling Machine Production
Scheduler

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