

QRM For Reducing Lead Times

Minster Machine (Minster, OH) has been a player in the metal press manufacturing environment since 1896. Despite Minster's dominance in domestic and international markets with press products, management decided that to grow in the 21st century, the company must diversify into other markets and other products besides presses. One of the designers of the new organization and processes was Joe Kumpf, VP of the Midwest divisions. Kumpf had been using Lean Manufacturing techniques for quite a few years to reduce costs and waste, but Lean did not provide any practical way to shorten lead times for manufacturers of highly engineered and custom products. Minster Machine decided to try the methods of Quick Response Manufacturing (QRM), a process totally devoted to lead time reduction invented by Rajan Suri.

In his book "Quick Response Manufacturing," Rajan Suri emphasizes that the organization must be changed to accomplish QRM. He says you must:

- Change the organization of tasks, procedures, equipment, and processes from a functional to a product-oriented basis.
- Transform the structure of your organization from hierarchical with many levels, to flat with cells and teams.
- Cross train employees from being specialists to do a number of operations.
- Managing processes from top down to team control.
- Replace complex centralized scheduling and control systems with simpler local planning and scheduling.

What follows are some highlights based on Minster's order process.

Quotation Stage

One of the problems with engineered and custom products is that requests for quotes often come with thick specification that require engineers to review every detail to avoid future problems.

Minster Machine feels that it is dangerous to have only a few people, especially people at very high levels in an organization, who are the only ones that can do such critical tasks. They have created, within divisions, the multi-functional capability to handle the quotation requirements.

Receipt Of Order

In many instances the customer wants to get the project a place in the schedule and a delivery date by just issuing an order number. Says Kumpf, "Discipline is essen-

tial here. Firm deliveries are contingent upon receipt of all necessary information. Our deliveries are based on the clock starting when all the information we need is received and not before. Some information may be scheduled during the production process if it is not required at the beginning. That means more proactive communication and setting of expectations."

Scheduling

This is a key point because sometimes the production scheduling folks want to place an order in the schedule to fill or utilize capacity. But if the schedule does not allow time to do a good job of engineering, purchasing, and making parts, there will be mistakes. Minster focuses on "getting it right up front, taking whatever time is necessary, and then executing to a manageable plan."

Engineering

This is probably the hardest stage of custom manufacturing to manage. If the engineering is late it will impact the whole production schedule.

Kumpf says, "We do projects that sometimes have thousands of engineering hours. We also have raw material release, long lead time component release, and other staged release from engineering as needed to maintain the critical path process. If this is not happening then there is opportunity to reduce lead time to a project by staging the priority of release."

Order Release

After engineering, production control then releases work orders to both the machine shop, fabrication shop, and purchasing. Even if the engineering is on time there are often delays in getting all the parts together to begin assembly. This is particularly hard for purchased parts because the customer may dictate new vendors and some vendors may miss their delivery dates. Minster uses a high level "master scheduler" function that is outside of the divisions, but after that, the buying and planning activity is primarily performed within the division.

Purchasing

Purchasing occurs at Minster at a corporate level to find and develop suppliers. The actual buying and scheduling of product is performed by buyers/planners within the divisions. The requirements, expediting, status, quality, etc. of vendors is managed within the divisions. Minster

has solved many of these problems and validated lead times by identifying these issues and getting vendor lead times at the time of quotation.

Start Assembly

This is probably the single biggest problem in the production process. Assembly has a start date to begin assembly, and they will begin regardless of whether they have all of the parts or not because they are forced to build to the production schedule. The assembly people have to wait on expedited parts and this forces assembly into starts and stops which drives up labor hours for people waiting for the parts.

Minster also experiences part shortages at the start of assembly. They have solved part of the problem by using cellular sub-assembly. The build time has become very short for sub-assemblies using this process and therefore, there is not much advantage to starting ahead of all parts being there.

Testing

If the production schedule falls behind, all of the lost time has to be made up during final assembly and test to meet the due date. This means tremendous overtime and a test and inspection that is not complete— which lead to quality problems during installation. Minster discusses and negotiates a testing procedure at the time of customer order. The checkout requirements are then included in the job definition. This way Minster knows exactly what the customer wants to check. But the real answer is predicting the time of each stage and then managing the process.

Kumpf says that over time their QRM approach, specifically the implementation of the divisional structure that mimics QRM's Quick Response Office Cells (Q-ROCs), has created new business opportunities, enhanced relationships with customers, and resulted in improved volume and profit.

Mike Collins is the author of Saving American Manufacturing, a comprehensive step-by-step strategy that demonstrates how to ultimately become an organization that will continually find new opportunities in today's fast-changing global environment. IMPO

