Prevent Problems Through Perfect Planning

Take this quiz to determine whether your scheduling system is as good as the major airlines' at helping your bottom line.

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The metalcasting industry can take several scheduling tips from the airline industry. For all of the faults and complaints against airlines, tens of thousands of flights are scheduled on a global basis every day, with the vast majority being on-time and traveling to the right destination. As a customer of airlines, you expect to go from point X to point Y, departing and arriving on time. The plane is staffed, stocked and fueled, the luggage is stowed, and the tray tables and seats are in an upright and locked position.

The next time you travel by air, think about what goes into getting you to your destination. The process starts well before you make your reservation, with an analysis of economic demand and supply curves and the costing and estimating behind them. As a customer, you want on-time delivery, and as a business, the airline wants a normal economic profit, where marginal revenue equals marginal cost.

As a metalcaster, you have to analyze your throughput in order to meet customer demand today and tomorrow. Do you need to add more core or molding machine capacity? Do you need to hire more employees or schedule more shifts and work days? These are all functions of advanced scheduling techniques. Decisions have to be made as to whether it is financially and economically more advantageous to have overcapacity or under-capacity (empty planes sitting on the tarmac vs. flights filled to capacity with customers going to the competitors to achieve on-time delivery). In the metalcasting industry, how much lead time will your customers tolerate before they go to the competition?

When you fly, each time you encounter a person with the airline, they had to be "scheduled" to perform their function, from check-in to baggage handling to directing you to your gate. When your plane arrives at the gate, think about where it came from and what it took, scheduling wise, to reach its destination. A multitude of schedules within schedules within schedules are bringing this all together.

So, how do you schedule your metalcasting operations, and how well do you schedule them? What benchmark do you use to measure the effectiveness of your scheduling? Most importantly, how much did it cost you to schedule your deliverable? Take the following quiz to reflect on your operations' scheduling prowess.

Pop Quiz

The following questions and discussion points will help you form an idea of where your scheduling stands and how it can be improved, keeping in mind that perfect planning prevents problems, such as late delivery or long lead times.

Question #1. How do you schedule your metalcasting operations?

- ☐ A. We don't schedule.
- ☐ B. In my head.
- ☐ C. Scrawled on the back of an envelope.
- ☐ D. With a spreadsheet.
- ☐ E. Using an enterprise resource planning (ERP)/material resource planning (MRP) computerized system.

Basic scheduling does not have to be difficult or time consuming. Even with the most robust scheduling systems, human intervention is required. The production scheduler must have the ability to make "tweaks" to the system for

items and situations that are outside of the knowledge of the scheduling package. The scheduling system is only as good as the information you provide it.

Question #2. How often do you meet customer delivery demands?

- ❑ A. Never on time.
- ❑ B. Sometimes on time.
- ❑ C. Always on time.

Why are airlines in business? To make a profit. Why are you in the metalcasting industry? To make a profit.

Customers are the only ingredient in making a profit. Airlines continue to meet customer delivery demands of flying from point X to point Y with reasonable accuracy and on-time performance. The airline industry's recent slew of surcharges are a method by which airlines assure their survival by generating a normal profit.

Scheduling within a metalcasting environment is paramount to meeting customer delivery demands. Generally speaking, a metalcasting customer is a middleman that fulfills orders that are placed by the customer's customer. The ability to meet customer delivery demands is a primary function of scheduling.

Question #3. When placing an order, a customer is able to be provided with a delivery date that is ___?

- ❑ A. Not accurate.
- ❑ B. Within three sigma of the mean.
- ❑ C. Mostly accurate, within two sigma of the mean.
- ❑ D. The date the customer wants and almost always on time.
- ❑ E. We don't provide delivery dates.

Your customers should not have to hedge their delivery dates in order to assure your product arrives on their shipping dock at the correct time. Backscheduling from the customer delivery date provides the optimum production schedule for your metalcasting facility. When properly set up with correct metrics of molds per hour, efficiency rates and time studies, a scheduling system can assure that your customers will receive their products when they demand them.

To determine your on-time performance rating, calculate as a percent how well you meet your customer demands. If you accept and confirm an order from a customer and provide a ship date and delivery date in return, then these are the dates to use, and your goal is to meet them. Ship date and delivery date are different due to transit times, customs inspections, foul weather, etc.

If you are not provided with actual delivery dates from your customer, then ask for them. Adjust your transit times in your scheduling calculations accordingly.

Question #4. In meeting your customer delivery demands, how much raw material and feedstock do you have in stock?

- ❑ A. We never have enough in stock, are constantly scrambling to order more to meet demand and often pay premium delivery prices.
- ❑ B. We sometimes run low on materials and have to delay production.
- ❑ C. We always have more than enough material on hand.
- ❑ D. We understand how our customer demand impacts material inventory and adequately balance demand with supply.

Idled material inventory represents wasted money with a great opportunity cost. Opportunity cost is the money lost when it could have been utilized in a more efficient way, such as earning interest. For instance, major corporations "park" their cash overnight and on the weekends at various financial institutions to earn a few hours of interest. Over a period of a year, this can return millions of dollars.

Airlines are masters of material inventory scheduling and management. The airplane is only stocked with the required number of meals, water and fuel. Anything extra that is brought on board the airplane becomes waste and an expense.

Your scheduling system should have a forward planning material inventory system that is closely associated with the production scheduling system. Through this forward planning of material inventory, lost opportunity cost can be avoided by ensuring that only the required amounts of materials are in inventory to meet actual customer demand based on orders on the books. Expensive inventory of materials should not sit idle when there is no demand for it. Metalcasters without a scheduling system in place that also lack material inventory forward planning must resort to maintaining inefficient levels of inventory, which costs money. Remember, inventory is a line item on the balance sheet of a company and is directly tied to the cost of goods sold on the income statement. Misappropriated inventory is an opportunity cost.

The following steps can help improve your inventory balance:

- Allow your purchasing manager to schedule material inventory levels tied into firm orders on the books.
- Periodically walk out into your storage areas and visually see how much material inventory is on hand.
- Ensure that your scheduling system is closely associated with your material inventory system and that you have the ability to forecast demand through a purchase order planner.
- Establish recipes of what quantity of raw materials and purchased goods, such as filters, are consumed.
- Automatically relieve purchasing material and stock inventory when production is entered routing-step-by-routing-step into the computer.
- Monitor and secure your materials against loss through employee theft. Copper, as an example, is an expensive commodity and employees have been caught stealing containers during the day for sale to recyclers.

Question #5. Within your process flow, how do constraints or bottlenecks affect your operations?

- ☐ A. We're not sure we have them or where they are.
- ☐ B. They make effective scheduling virtually impossible.
- ☐ C. They have been identified in some places, but others may exist.
- ☐ E. They have been identified and scheduled around.
- ☐ F. We have an ongoing process of isolating and correcting bottlenecks so that we can accurately schedule.

By identifying and eliminating a constraint in the operation, an organization can achieve maximum profit. If a molding line is capable of producing 100 molds an hour, but the core department can only supply 25 cores per hour, then regardless of the molds per hour, the total speed of the production line, and every routing step beyond is only 25 units per hour. Instead of using capital to increase the molds per hour, something must be done to increase the cores/blows per hour. It helps to create a graphic representation of where your bottlenecks are.

In a good scheduling system, management will be able analyze how increasing the number of shifts in the core room or adding core machines can affect downstream processes. Recording throughput production rates allows you to determine how many days it takes a casting to go through a process, such as de-spruing or X-ray testing.

In analyzing a schedule for a particular part that has been back-scheduled from the customer delivery date, it becomes readily apparent where the bottlenecks are. Confirm your findings by walking through each process to visually determine the bottlenecks' locations. These will be the places with the most castings in line. Idle castings generally represent wasted money.

What's Your Grade?

It's final exam time. How much does it cost to schedule your deliverables? Cost is a function of doing business, and profit is a direct result of how well costs are managed. Profit should be greater than your costs. A multitude of costs are associated with inefficiently scheduling the operations in your metalcasting facility. However, through the use of modern scheduling techniques, you can dramatically improve customer on-time delivery performance, effectively manage labor and material costs, and increase your profits. ***MC***

About the Author

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Additional Scheduling Resources

Magazine Articles

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Websites

www.erpfans.com — Independent user group with enterprise resource planning (ERP) news, resources and forums.

www.brint.com — Covers a variety of business topics, including ERP and material requirements planning.

www.erpassist.com — Offers news, articles, discussion groups and other resources related to ERP.