

## Chapter 10

### THE MASTER SCHEDULER'S JOB

What makes a good Master Scheduler? Vern Owens, the VP of Operations at the Continental Chemical Company, was facing that very question. He had promoted the current Master Scheduler, Mary Sizemore, to the plant manager's job at their Texas operation. Vern saw the opening created by Mary's departure as an opportunity to review what the Master Scheduler's job is all about.

Vern the VP and Mary the former Master Scheduler met in Conference Room C. They were joined by Connie Stephenson, the Customer Service Manager and Dan Myers, Director of Manufacturing, both of whom had worked very closely with Mary over the past four years. Sheila Conway, the Supply Chain Manager and Mary's direct boss, joined the meeting a bit later.

Vern started the session by saying: "I'd like to brainstorm a bit about this job of Master Scheduling. Specifically, I'd like us to answer these questions:

- What are the characteristics — the traits — of a good Master Scheduler?
- What should the Master Scheduler do? What tasks are involved?
- What tools and other support does the Master Scheduler need to do a first-rate job?"

On the chalkboard that ringed the room, Vern wrote three words, each on a different panel:

Traits

Tasks

Tools

They tackled traits first.

#### **Traits (Characteristics) Needed by the Master Scheduler**

Mary started off by saying that the Master Scheduler should be faster than a speeding bullet, more powerful than a locomotive, able to leap tall buildings in a single bound, and wear a cape and a sweatshirt with a red S on it. Then they got a bit more serious, and came up with the following traits. Vern made notes on the chalkboard.

#### **Good Product and Customer Knowledge**

The Master Scheduler sits at the intersection of demand and supply. On the demand side, a working knowledge about the product and how customers use it can be a big plus, enabling the Master

Scheduler to better understand the issues and the problems faced by customers. This is particularly important when the Master Scheduler has direct contact with customers.

Experience in direct sales, sales support, or marketing, while not a must, can be very helpful, enabling the Master Scheduler to see things through the eyes of the customer.

### **Good Process Knowledge**

Knowing the manufacturing processes used in the plants makes for a more effective Master Scheduler. In many companies, much of the Master Scheduler's job is to develop "Plan B" — also called coping with change. When things go wrong on the plant floor, or a supplier can't deliver, or when customers change their minds, a new plan must be developed and *that plan must be doable*. Good process knowledge makes this much easier. For this reason, experience in the plant or Purchasing (or both) is very desirable.

### **Good Communication Skills**

A failure to communicate is something the Master Scheduler should never be guilty of. Much of the Master Scheduler's job is to facilitate communications between others. This person receives demand information (forecasts, orders, customer schedules, etc.) and translates it into schedules by which the plants and suppliers can meet the customers' needs. When things go wrong and the schedules need to be changed, another round of communications — to both demand and supply people — is often necessary.

In addition, direct communications with top management can be necessary when these decisions involve exceptions to existing strategy or policy, or take on high risk. Wallflowers need not apply.

### **Good Conflict Resolution Skills**

When conflict occurs, the Master Scheduler is expected to bring about resolution. The position itself does not hold decision-making authority, but the Master Scheduler needs to bring others from the demand and supply sides of the business together to make clear decisions. Handling normal and expected conflict between the demand and supply folks is simply part of the job. The Master Scheduler needs to present both sides of a situation, identifying alternative solutions and consequences which others can use to make decisions.

If this person is averse to conflict, problems may get ignored until they fester and finally explode. An effective Master Scheduler will address conflicts early, so that they can be resolved sooner and easier rather than wait until later when resolution will be more difficult. All of this needs to be done in a very dispassionate fashion, which leads to our next characteristic.

### **Steady, Even Personality**

The day-to-day pressure of doing the Master Scheduling job can be substantial. It's impossible to satisfy all of the people all of the time. This job is not for someone who can't handle stress well. A good Master Scheduler should be able to bring a calming influence to what are potentially volatile situations.

### **Honesty and Integrity**

The Master Scheduler deals with many difficult issues in tough circumstances. Honesty, candor, fairness, being upfront, having no hidden agendas — these are all important traits for Master Schedulers. They must earn and maintain the trust and respect of the people with whom they work, both inside and outside the company.

### **Computer Literacy and Software Knowledge**

It's hard to imagine in this day and age, but there may still be a few people out there who can't deal with computers. Those folks will have a hard time in the Master Scheduler's job.

The Master Scheduler should have substantial knowledge of the Master Scheduling software and the larger Enterprise System (ES) of which it's a part. The good news is that the important parts of these software packages can usually be learned in a fairly short time. We'll touch on this software issue again later in this chapter.

### **Good Administrative Skills**

Last but not least, the Master Scheduling job requires the handling of large amounts of information. For this reason, the person should be organized and self-disciplined. Handling the detail, but not getting lost in it, is essential to success.

Back to Conference Room C. Vern's list on the chalkboard looked like this:

TRAITS

Good Product & Customer Knowledge

Good Process Knowledge

Good Communication Skills

Good Conflict Resolution Skills

Steady, Even Personality

Honesty and Integrity

Computer Literacy and Software Knowledge

Good Administrative Skills

Connie asked: "Are these in order of importance? Are the first ones more important than the others?" The consensus was no, and that being honest, trustworthy, and so forth was probably the most important. But by itself, it was not sufficient. Mother Teresa might not have made a very good Master Scheduler; the other traits are essential as well.

As Vern Owens considered this list of characteristics, he wasn't surprised that Mary had done such a fine job as Master Scheduler, gaining his confidence and earning the promotion to plant manager. She had all the personal characteristics: good person, good communicator, good conflict resolver. Further, she had a varied set of prior experiences, starting in the lab as a quality engineer, followed by a tour on the plant floor as a production supervisor. During this time, Mary took and passed the APICS certification exams for production and inventory management. She then became part of the sales support function, working with product application problems in the field, and then moved into Master Scheduling.

Vern also began to realize that the right candidate should be someone from inside the company. This was because learning how to Master Schedule effectively was a big enough job in itself, without adding to it the development of relationships, confidence, and trust. One other thought occurred to Vern — if he found the right person, they too would probably become upwardly mobile, as did Mary. The Master Scheduler's job is a fine training ground for even bigger jobs down the road.

Next, the group turned its attention to the tasks involved in Master Scheduling.

## Tasks: What the Master Scheduler Does

Mary started the ball rolling on this topic: “Rather than reinvent the wheel, how about if we look at the job description? I think it’s a good one and it certainly seems to be complete.” For Consolidated Chemical’s Master Scheduler job description, see Figure 10-1.

The group noted that the Master Scheduling job has little or no direct authority, but has a lot of influence about what happens. People in Sales & Marketing and Operations make most of the decisions, and sometimes executive management gets involved. The job of the Master Scheduler is to do the homework necessary to allow these people to see and understand the alternatives and the consequences of their decisions.

Vern smiled and said, “Remember back about two years ago, when that big order from GFE came from out of nowhere? The Sales guys had been trying to crack that account for years with no luck. Our response to that order, both internally and to the customer, was super. That’s when I became really confident in our Master Scheduling processes and in Mary’s abilities.”

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Mini Case: A Chemical Manufacturer. Continental Chemical, a fictitious but typical company, is in a very capital-intensive business. The initial cost of chemical reactors is enormous and their designs, until recently, were based on the need for ‘economy of scale’ and volume. As a result, changeovers are very time-consuming and inefficient. Continental tries to load the equipment to a high percentage of utilization and they change over infrequently to minimize both downtime and off-grade material.

One day, out of the blue, Connie Stephenson in Customer Service received an inquiry for a large order from GFE, a customer that the competition had all locked up . . . until then. Recently the competition was not doing a good job for GFE — almost always shipping late and incomplete.

GFE’s inquiry with Continental was to see if they could meet an emergency order. This order was for a large volume of product, required inside of the Planning Time Fence, but if successful, it might mean a substantial amount of additional ongoing business.

Connie contacted Mary, the Master Scheduler, who in turn communicated with Dan, the Manufacturing Director, and with the manager of the Kentucky plant, where most of the product

Figure 10-1

Consolidated Chemical Company  
Job Description — Master Scheduler

**Basic Function**

Convert demands (forecasts, customer orders, customer schedules, etc.) into schedules to assure that matched sets of materials and capacities are available to meet the needs of customers in a cost-effective fashion within the volumes as specified by *Executive S&OP*.

**Duties and Responsibilities**

1. Contribute to the *Executive S&OP* process, particularly the Supply Planning Step.
2. Participate in the creation of an effective and appropriate Master Scheduling policy.
3. Load the Master Schedule through the Planning Time Fence to the volume specified by the Production Plan from the Executive S&OP process.
4. Identify, negotiate, and bring to resolution any demand/supply imbalances in both volume and mix.
5. Review and manage change requests from customers, plants, and suppliers, making appropriate reschedules in accordance with the Master Schedule policy.
6. Recognize the need to maintain stability in the Master Schedule, while being responsive to the needs of customers.
7. Allow no past due's in the Master Schedule.
8. Develop and maintain planning data, such as: Planning Bills of Material, Safety Stock, Lead Times, Lot Sizes, etc.
9. Monitor forecast consumption and the proper use of Available-to-Promise.
10. Inform the appropriate individuals, per the Master Schedule policy, of any issues that cannot be handled within the framework of that policy.

**Method of Measurement**

- Managing the Master Schedule to stay within +/- 2 percent of the Production Plan as authorized in Executive S&OP.
- Enabling the plant to achieve 95 percent or greater performance of the Master Schedule for dates and quantities within specified tolerances.
- Holding action messages at 10 percent or less of items being Master Scheduled.
- Maintaining zero past due within the Master Schedule.

**Reporting Relationship**

The Master Scheduler reports to the Supply Chain Manager.

in question was made. Mary asked them a lot of questions prior to getting down to the nitty gritty: to figure out what could be done to accept this order and to determine the consequences of doing so.

The outcome of the Master Scheduler's research resulted in the following alternatives:

1. Accept the order and reschedule one of the current customers already promised. This would mean going back on a promise to a current customer. This alternative would also increase cost because it would involve an additional changeover.
2. Purchase product from a source outside the company, resulting in a very small profit and perhaps a loss. Also, they weren't too sure about the source's quality.
3. Produce the product at the Utah plant and ship it to GFE's location in North Carolina at considerable additional expense, resulting in a loss on this order.

The VP of Sales & Marketing indicated that the needs of all existing customers had to be met as scheduled. The Plant Manager's position was that he could not take on additional sales volume without incurring significant costs and thus jeopardizing the plant's profit goals for the fiscal year. Thus this situation could quite likely affect the business plan, and carry a significant degree of risk. Mary briefed the vice presidents of Sales/Marketing and of Operations, outlining the alternatives, their opportunities, and the costs involved.

That meeting was reconvened the following morning and enlarged to include the VP of Finance and the President. Once again, Mary detailed the alternatives with their attendant good news/bad news. The group made their decision, accepted the order, produced it in Utah thereby losing a few dollars on freight, shipped it on time and complete, and captured a substantial amount of ongoing volume from their competition. That's when it first occurred to Vern that Master Scheduling had become a significant value-add — and a competitive weapon — to the company.

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Even though the Master Scheduler does not normally have line authority, s/he does exercise large amounts of judgment. That judgment is to make things happen within existing policy, strategy, and business conditions. When this can't be done, the Master Scheduler needs to raise the issues and problems with the proper authority for changing the constraints or accepting the consequences.

In some cases, the Master Scheduling job is a full-time position; in others it's part-time depending on:

- The complexity of the products and processes
- The volatility of the customers and marketplace
- Centralized (at the general office) or decentralized (at the plants)
- The volume of items being Master Scheduled
- Supervisory responsibilities

When the job of Master Scheduling is less than a full-time position, it is often combined with responsibilities such as: production control manager, plant scheduler, assistant plant manager, finite scheduler, supplier scheduler, customer order department manager, forecast analyst, and the like.

Although the Master Scheduler may report administratively to either the demand or supply side of the business, they should not see themselves as aligned with either one. To some degree, they must blur the distinctions between departments, balancing responsiveness to stability, plant productivity to inventory, and cost to customer's needs. Thus the Master Scheduling job is *both* demand and supply related.

Back to Conference Room C. The group concluded that the current job description did an adequate job of spelling out the tasks involved in Master Scheduling. Vern wrote on the chalkboard:

TASKS

*See job description*

Next Vern said, "Let's tackle tools, and then we can go to lunch."

## **Tools: What the Master Scheduler Needs**

### **A Master Scheduling Policy with Teeth**

"Well," said Mary, "the first thing that comes to my mind is the Master Scheduling policy. Without that, I'd have been hung out to dry dozens of times." Before we had that policy, people would duck decisions that only they should make. That would leave the decision pretty much up to me and — in most cases — I wouldn't have nearly as much knowledge and information as they did.

“Of course, the opposite of that happened also: Sometimes they’d unilaterally tell me to make a change to the schedule that should have had buy-in from another part of the business. This happened a lot with abnormal demand. Let me tell you, it’s pretty difficult to say ‘no’ to someone with a VP title who’s two levels above you in the organization. Right, Vern?”

“Anyhow, after we created the Master Scheduling policy, that all went away. I can’t imagine anyone being able to do a first-rate job of Master Scheduling without a policy statement like this.”

The Master Scheduling policy is a concise but complete document that details roles and responsibilities. Authorized and signed by top management, it spells out to the Master Scheduler and others on both the demand and supply sides of the business, who owes what to whom. It specifies who is empowered to make decisions and under what circumstances. See Figure 10-2 for a sample Master Scheduling policy.

### **Accurate Data**

Unless a company is completely make-to-order or design-to-order, the Master Scheduler can be crippled by bad inventory records. In a make-to-stock situation, the on-hand inventory balances of the finished products must be highly accurate. In finish-to-order environments, high accuracy is required on the inventory balances of completed modules, intermediates, and other components waiting to be used on the final products.

In a broader sense, high accuracy is required on many other items necessary to make the overall resource planning processes (ERP) work well: bills of material, routings, and so forth.<sup>1</sup> These items can *indirectly* impact the Master Scheduler, because they can prevent the proper functioning of material planning, supplier scheduling, and plant scheduling, thus preventing the Master Schedule from being properly executed. We’re stressing inventory accuracy here because it *directly* affects the Master Scheduler’s ability to do his or her job. More on this in Chapter 11.

### **Good Software**

It’s possible to do Master Scheduling manually. This is particularly true in Lean Manufacturing environments, where we’ve seen some creative approaches to manual Master Scheduling (some good and some not so good). However, most companies — Lean or otherwise — use some degree of computer support for Master Scheduling; they feel it’s simply too time consuming and error prone to do manually.

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<sup>1</sup> For more on data integrity requirements in an ERP environment, see Wallace and Kremzar, *ERP: Making It Happen*, New York: John Wiley & Sons (2001).

Figure 10-2

### Sample Master Scheduling Policy

**Objective:** The Master Schedule balances demand and supply at the mix level. It extends sufficiently into the future to cover the lead times associated with detailed material and capacity planning, and is defined by the Planning Time Fence. Both Sales/Marketing and Operations play a significant part in its proper management. The Master Scheduler's role is to facilitate and monitor adherence to policy in this regard.

**Specific Issues:**

- The Master Schedule summed by family must equal (within a specified tolerance) the Production Plan as specified by the Executive S&OP process (or its equivalent).
- The Master Schedule must be achievable, assuring specific material and capacity availability.
- Decision-making authority to change the Master Schedule within the Planning Time Fence does not rest solely with the Master Scheduler. The attachment to this document defines who can authorize changes within the PTF, and this varies by type of product, the magnitude of the change, and when the change is desired.
- In the event that agreement cannot be reached regarding a requested change, the General Manager will make the decision.
- Sales and Customer Order Entry must use Available-to-Promise in making customer commitments.
- Forecasts are maintained by Sales/Marketing and are properly consumed by customer orders.
- Exception messages are monitored and acted upon, and the principle of "no past due" is adhered to.
- On-time plant performance to the Master Production Schedule is 95 percent or higher and the plant is held accountable.
- Stability within the Master Schedule is essential, and changes to the Master Schedule are measured and managed to an acceptable level. Within the Planning Time Fence, the number of MPSs rescheduled in should approximately equal the number rescheduled out.
- The Master Scheduler chairs the weekly meeting between Sales/Marketing and Operations to review issues, performance, and problems related to shipments and production.

To be effective, Master Scheduling software must:

- be reasonably complete in terms of functionality: forecast consumption, Available-to-Promise, projected available balance, time fences, and so forth.
- be based on standard logic<sup>2</sup>. If the software won't consume the forecast properly, for example, the Master Scheduler will have a very difficult time being successful.
- be easy to understand and easy to use. Complexity is bad; simplicity is good.

## Support

Last but not least is the issue of support. The Master Scheduler, as we've said more than once, is the guy or gal "in the middle." It's a tough job. Guided by the Master Scheduling policy, s/he'll sometimes have to say "no." Once again, you can't please all of the people all of the time.

What can help is an awareness by the Master Scheduler's primary internal customers — Sales & Marketing, Operations, General Management — that it is a tough job. These people should let that awareness guide their relationships with the Master Scheduler. Praise is appreciated. A well-placed "good job" or "thank you" can make a difference.

Vern finished adding these points to the chalkboard:

### TOOLS

Master Scheduling Policy with Teeth

Accurate Data

Good Software

Support

The group looked at these for a bit, and then checked the other two panels:

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<sup>2</sup> An excellent reference work here is Darryl Landvater and Chris Gray's book: *MRPII: The Standard System*, New York: John Wiley & Sons (1989).

TRAITS

Good Product & Customer Knowledge  
Good Process Knowledge  
Good Communication Skills  
Good Conflict Resolution Skills  
Steady, Even Personality  
Honesty and Integrity  
Computer Literacy and Software Knowledge  
Good Administrative Skills

TASKS

See job description

They liked what they saw. There were smiles and nodding heads. No one came up with anything to add, and it was time for lunch.