

# Seradex White Paper

*A Discussion of Issues in the Manufacturing OrderStream*

## ***Production Scheduling, or How do I Ship on Time?***

Those of us involved in production and manufacturing have found the past several years to be quite challenging. In company after company, attention is shifting back to the source--to the plant--- and fundamental issues are being addressed once again.

One such fundamental is plant scheduling as a basic issue. The schedule after all is the driver of all day-to-day activities. The schedule determines output and performance. Some companies have confronted their scheduling difficulties successfully. For them, their new approach is part of the solution--it is the key to a new level of highly productive and profitable operations. Others have stayed away from the basic change. For them scheduling remains part of the problem.

The innovative companies have adapted their plants to shorter runs, less work-in-process inventory and faster response time to customers. For others, scheduling is still a problem--a major point of leverage that continues to erode profits.

In this article, we will review some of the symptoms of poor scheduling. As you consider each point, check off your own plant's situation. You may conclude that you have a sizeable opportunity awaiting your attention.

### **Excessive Work In Process**

Many companies have made impressive strides in recent years toward more effective manufacturing and control systems. They have built data bases and have improved shop floor and inventory reporting disciplines. Some are reporting sizeable reductions in raw material inventories-- at least partly stemming from better planning and control. Typically MRP systems have assisted in achieving those raw material reductions.

But much less progress has been made on the shop floor. For many, the more difficult problem--or opportunity to look at the positive side is work-in-process inventory. The problem seems to defy logic, MRP logic in any event.

Excessive WIP levels hurt performance in many ways. The most direct is the high cost of financing the WIP investment. Next comes the direct link between WIP and production lead time. A high level of WIP is a guarantee of long production lead times.

Although many manufactures recognize the opportunity and understand the leverage lower WIP offers, many are stymied. Improvement to layout and faster change overs are certainly excellence steps in the right direction but what has been missing is the overall logistical system that leads to sizeable, permanent results.

## Month-End Syndrome

Many plants have a pattern of shipments that is as predictable as the phases of the moon. For the first part of the month, the output rate is fairly steady, but lower than required operations proceed at a comfortable pace. Suddenly as the end of the period approaches the pace quickens. Some companies ship as much in the last period as they shipped in the first three.

Most companies that suffer from month-end syndrome see it as a source of tremendous inefficiency and frustration. If they staff for the peaks, they face viable idleness and low productivity 75% of the time. If they do not staff for the peaks, each surge results in high overtime cost etc. Equally disturbing, when formal systems cannot cope, "squeaky wheel" decision-making takes over. Expediting becomes a way of life.

A number of explanations are offered for why this kind of cycle persists. Salesman delaying orders and payment terms which favour late-month shipping are commonly put forward. The month end sales/dollar shipped performance measurement. Products schedules are set to maximize efficiencies--to maximize run-lengths, to minimize changeovers, to make individual departments numbers look good. Batch-size decisions are made to appease some arbitrary mathematical lot-size equation.

Most of the reasons given are internal decisions and usually customer requirements (actual demand) are not fully considered.

## Travelling Bottlenecks

Many plant managers blame sputtering output and erratic order date performance on travelling bottlenecks. The schedule looked good until a sudden overload was discovered in grinding, or assembly. When it comes as a surprise, the bottleneck limits production. Instant overtime is available, but too often shipments are late, and schedules throughout the plant are disrupted.

So common is this kind of situation that many managers have come to accept it as an intrinsic feature of their operation. Like the surge at the end of the month, they accept roving bottlenecks as the natural state of affairs, and in both cases a great deal of time is routinely spent expediting "hot" parts on the shortage list.

Even companies with well developed MRP systems are not immune to this problem. In the planning department a common response is to increase standard lead times in the departments that are most often overloaded, however, these results in longer lead times and higher WIP inventories without solving the real problem at all.

The easy explanation for travelling bottlenecks is that the mix of orders and therefore the mix of work changes, causing heavy requirements at different places at different times. In most plants, though, the basic work center load profile remains surprisingly stable over time. Changes in mix do alter the profile but only marginally.

## UNIFORM SCHEDULING

We have discussed some of the common symptoms of poor scheduling there are others. Sometimes early-mostly late, high level of finished goods of some items at the same time a shortage of other items. In all cases, the solution lies in better scheduling.

Uniform Scheduling is an actual planning method for resource allocation based on smooth production flow. The mix of products required for the month are made on a daily bases. The key is to produce some of every product every day. The daily schedule is the same for the entire month.

For example let's assume our monthly demand for this period is: 200 part A, 100 part B, 100 part C, 40 part D. Typical month schedule would be to produce all 200 of part A, followed by 100 part B or Part C and finally the 40 part D.

As a customer of part D unless it was stocked would have to wait till the end of the period in order to acquire product. Now, Uniform Scheduling states " build some of every product every day". So under those rules the monthly schedule would be broken down to show a "Daily Schedule"-- of 10 parts of A, 5 parts each of B and C and 2 parts of C. The results of scheduling in this manner is we now have products available to sell and ship every day.

Some of benefits of this approach, over our typical method are, the same daily schedule for the entire month, equipment balance, material control work center loading to name a few.

Uniform Scheduling in itself can have a major impact on the problems mentioned early in the article. The greatest benefit of all is to fulfill our customers demand for more frequent

deliveries of less quantity, which is increasing every day.

Those of us involved in production and manufacturing have found the past several years to be quite challenging. One overlooked fundamental area is plant scheduling. The schedule after all is the driver to all day-to-day activities. Those companies which have confronted their scheduling difficulties have achieved a new level of highly productive and profitable operations. The innovative companies have adapted new approaches such as Kanban, Uniform Scheduling and True Finite Scheduling methods to achieve the overall logistical systems that lead to sizeable and permanent results.

### PRIORITY MANAGEMENT:

"Squeaky Wheel" decision making takes over, expediting and overtime becomes a way of life. Schedules are set to maximize internal efficiencies such as run-length, machine utilization, change overs, lead-times are extended due to bottleneck's. These are internal decisions and usually customer requirements are not fully considered. We have indicated some of the common symptoms of poor scheduling there are numerous others. Sometimes early - mostly late, high level of finished goods of some items at the same time a shortage of others. In all cases, the solution lies in better scheduling.

### UNIFORM SCHEDULING:

A planning method used for resource allocation based on a smooth production flow. The mix of products required for the month are made on a daily bases. The key is to produce some of every product every day. Some of the benefits of this approach, over typical methods are: products are available to sell and ship every day, the same daily schedule for the entire month,

equipment balance, material control, to name a few.

### **Kanban signals**

The main rule is that the preceding operation signals the prior operation as to when it requires components (JIT). Kanban systems can be used to control production requirements all the way from the customer through production to outside suppliers.

SERADEX INC. experience has indicated that most companies, whether in a job shops or mass production environment can benefit from adopting better scheduling methods.

As your customers become more demanding for shorter lead times and more frequent delivers you must respond to satisfy their needs. Scheduling is a critical area to improve to maintain on-time delivery. If your organization has some of the above symptoms and you would like to further discuss on how they might be resolved, please call us and arrange a time for to meeting and a review your present situation.

**COMPUTER ASSISTED TOOLS:**  
Typical MRP SYSTEMS lack good scheduling logic. Frequently they ignore capacity constraints and offer no priority control. Today there are far superior finite scheduling systems that generate a meaningful and realistic schedules with "WHAT IF" capabilities. These tools give the Master Scheduler far more flexibility to generate a more optimized schedule then in the past.

**KANBAN "PULL SYSTEMS":** A scheduling system driven by actual consumption of components using synchronized replenishment signals for control. These signals are referred to as



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