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PRESIDENT'S MESSAGE

Simplify Your Job—Understand the Maintenance Funnel!

If you are reading this article, the chances are good that you have responsibility for manufacturing assets in some form. In that case, you have a very complex job, with many demands:

- Do more with less every year
- Prevent failures ins spite of lack of authority to take all proper actions
- Assure no one gets hurt
- Participate in or lead 10-20 improvement initiatives during the year

Where do you start? How do you get the time to work on this? What models do you follow? How will you know if you are successful?

One distracter is the plethora of solutions our industry throws at you, what we call **Alphabet Soup**. You are bombarded by vendors hawking their concepts (and yes, we are among them!):

- CMMS (Computerized Maintenance Management Systems)
- P&S (Planning & Scheduling)
- PM (Preventive Maintenance)
- PdM (Predictive Maintenance)
- LCC (Lifecycle Costing)
- RCFA (Root Cause Failure Analysis)
- MTBF (Mean Time Between Failure)
- FMEA (Failure Modes and Effects Analysis)
- FMECA (Failure Modes, Effects and Causes Analysis)
- RCM, RCM2, RCM Lite (Reliability Centered Maintenance)
- TPM (Total Productive Maintenance)

Each one of these approaches proposes, to be THE SOLUTION (which is why we developed the SAMI Triangle, to show you where each fits -- see www.samicorp.com for additional information about the SAMI Triangle). The key point we want to impress on you, in this President's Corner, is that these are **tools**. Tools must be used within a **process** to be successful, and you need to *solve first things first*. None of these tools replaces good leadership and good management. Conversely, a good and experienced manager will choose these tools according to the goals they establish.

We suggest that an easier way to understand your job

is that maintenance is a process that receives work in, and puts work out. A useful way of looking at this is as a funnel.



S. Bradley Peterson
SAMI President

The identified work is your *backlog*. The funnel represents *your resources, their productivity, practices, and skills*. Your primary job, if you are in maintenance, is *completed work*. In almost every case, identified work or backlog is greater than the completed work. If you had excess craftsmen, they would be let go, so you will almost always have more work than you complete.

- What goes into the funnel?
- Emergency work
- Scheduled maintenance (inspections, PPM's, risk evaluations)
- Corrective work
- Turnarounds, outages, major maintenance
- Improvement work (RCFA's, FMEA's, RCM's, Reporting improvements, CMMS implementations, etc)
- Rework

What work always gets first priority? Emergencies! What is last to be done? Scheduled maintenance and improvement work! So here is the maintenance dilemma: the work we know we should be doing is the last work we do. And the net effect is that by failing to do prevention and improvement work, we encounter more emergency work. Thus the

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We are a consulting group for industrial organizations working to improve profitability, efficiency and equipment reliability. Our Mission is to improve our clients' production equipment health, by tapping the desire, creativity and dedication of all plant staff, and our vision is to be the firm consistently chosen by companies serious about making change; because our values of integrity, content knowledge, advanced practices and compassion for the workforce match the values of our clients.

THE OPERATIONAL RELIABILITY MATURITY CONTINUUM: PART 5 MATERIALS MANAGEMENT

BY RALPH HEDDING, PE



I was looking for a set of brake shoes for my Triumph TR-6 last Saturday, going through boxes and bins of parts accumulated in my garage over the years. During this search I found a new alternator for a 1986 Alfa, fuel injectors for a '76 Z car, a set of distributor points for a '64 MGB, but never did find the brake shoes. I know they are there, somewhere. This took up most of the daylight hours and I never got to do the job. All of the “extra” parts were for cars that had left my possession over the past twenty years. The “pack rat” in me had struck again.

During a break in my search, I thought of the many clients that experience very similar scenarios in their day-to-day business of executing work. In the last issue of *The SAMI Times*, I discussed the barriers to work productivity; materials barriers are always significant issues. Solving these issues are critical, but doing so requires a sound approach, a managing system, performance indicators, a plan, and a lot of perseverance. Hand-in-hand with materials management barriers are issues in pre-planning work prior to execution. For the purpose of this discussion, we will assume that a proper planning and scheduling process is in place, and the root cause of the barrier is poor materials management.

Materials to perform work come to maintenance from one of two sources: either directly purchased or from an on-site warehouse. Direct materials generally get bogged down due to several problem areas:

- Poor specifications on file: The current system is not updated to give the proper information on the part required leading to excessive time spent searching for this information.
- Cumbersome approvals process: When work is approved in many instances it requires another approval to purchase the materials for the job.
- Poor receiving practices: Parts and materials are received without a reference to a work order and are “lost” on the receiving dock.
- Poor notification procedure: Materials are received but poor communications between maintenance and purchasing introduces delays in applying the materials to the job.

Any of these will lead to less than optimum response of the materials procurement process causing undue delays in getting the job done. Warehouse provided materials introduce a more complex set of problems.

Facility warehouses are generally poorly run. Most managers responsible for this function have forgotten that they are serving two masters. They must provide a good return on the investment in this asset, and they must provide good service levels for the maintenance department. The key process measurements that gauge the effectiveness of both are:

- Annual Inventory Turns: Total annual issues from inventory divided by average annual inventory value. This number should be between 3.0 and 3.5 turns per year. We usually find inventories turning at less than 0.7 turns.
- Service Level: number of items issued divided by number of items requested. A service level of 97% is a good target. Eighty to ninety percent is the range we find.

So why are these values so low? The most common problems are one or more of the following:

- There are no measuring systems to gauge the performance. The measure we most commonly see is inventory value.
- There is no plan in place to improve inventory performance, as it is not viewed as a contributor to poor maintenance efficiency, but rather a cost problem.
- Obsolete parts are seldom purged from the inventory. This clutters the warehouse, compounding space allocation problems for good parts.
- Stock levels are out of line with demand. We find many cases of multi-year quantities in the bins.
- The CMMS (if in place) has not been updated with the proper specifications for the parts or categorization of parts is complex, making it difficult to find items.
- Cycle counting is not performed to match on hand records with on hand quantities.
- Max/min levels have not been adjusted since the parts were initially established.
- Security of the warehouse is poor. Items are removed without notification to those responsible for maintaining proper levels, driving down the service level.
- There is no rationale for establishing an item in the inventory.
- The reorder process is cumbersome and ineffective.
- The location of the facility has not been taken into account when the inventory was established. A warehouse for two identical facilities should vary greatly if one is located on Alaska's north slope versus one just outside of Philadelphia's metro area. Parts availability from local suppliers should significantly drive down the stocking requirements.

And the list goes on. The common theme of poor performing warehousing operations is complacency: it is not until we perform a “Day In The Life Study” and develop the indicator values are our clients fully aware of the impact poor materials management has on their internal productivity.

In this brief space it is difficult to get into much depth about this serious problem, so I've highlighted the major themes. Please contact me at SAMI if you would like to discuss this further. As for me, I'm heading out to the garage to continue my search...

PARTS, PARTS, PARTS

BY DAVE ARMY



Since the beginning of time (or so it seems), I've been writing about the key elements of Stage One Asset Management strategy. So far we've discussed Work Identification, Prioritization, Long Range Planning and Look Ahead Scheduling. I was planning to next discuss work execution, but was instead asked to talk about parts.

From a Maintenance perspective, all the planning and scheduling in the world won't help if the appropriate parts aren't available. At one time early in my career, I took over a maintenance organization and after accepting the position, was told that I also had responsibility for the warehouse and storeroom. My first thought was that I had died and gone to maintenance heaven. Maintenance controlled all of the parts in the warehouse and storeroom. What could be better?

Well, things still couldn't get fixed if the parts weren't there. We soon found ourselves scrambling to expedite parts and materials for critical work (high priority emergent activities). Sure, the craftsmen had all of the consumables they needed, tools weren't a problem, and after all, we were controlling the warehouse. Still, we weren't getting the job done as well as we wished. When asked to reduce inventory, that was the last straw. I begged management to relieve maintenance of the stores and warehouse responsibility. Our reasoning was that it would be better to complain than to have the responsibility. Thankfully, logic prevailed.

In retrospect, separating Maintenance from Stores does make pretty good sense. Maintaining a facility is hard enough, without adding the complexity of stores management. Maintaining a storeroom and warehouse is hard enough without worrying about maintaining the facility. Today, we call this Supply Chain

Management or Materials Management. Maintenance is a wholly different art form and takes different skills and abilities. However, the two disciplines are linked at the hips.

When we assess organizations for maintenance effectiveness, one of the most frequent complaints is that of the lack of parts to perform maintenance. We hear statements such as, "The parts they're supposed to have (the storeroom) are always out of stock," or "It was there last week but when I go to do the job, it's (the part) gone."

Often there is a complete disconnect between Stores and Maintenance. The two organizations seem to be at cross purposes. Maintenance needs the parts at any cost while Stores is charged to reduce costs.

When working with an organization to improve Stage One processes and performance, we often get involved in Materials Management issues. While not attempting to correct Strategic Supply Chain issues, we do work to resolve basic issues between Maintenance and Materials Management organizations. Oft times the solution is as simple as having Materials Management representation at the weekly planning meeting. Think about it. If you're at the stage where you can look reasonably into the future (more than one week ahead) for maintenance planning and scheduling purposes, wouldn't it make sense to get Materials Management involved in ensuring the required parts are available? Isn't this why we turn to long range planning?

When working with planners, we attempt to remove them from the expediting role. Once the planning horizon is pushed out, Materials Management Personnel can track to receipt of parts and materials. Set up your planning meeting to address, on a regular basis, the status of parts required for an activity. Make them (Materials Management) a part of the solution, not a part of the problem. You might just discover a change in attitudes and an improvement in service.



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downward cycle of working harder, accomplishing less, and deteriorating equipment condition. So, investing a lot of time and money into higher-level tools fails to bring results because there is seldom time to employ them!

What is the solution?

The SAMI Triangle suggests that the basic activity is improving the Work Management Process, or working on the funnel itself. In effect, we increase the aperture of the funnel, to get more work done. If, for instance, our workforce got twice as much work done as previously, we could do the emergencies, and the prevention, which would allow us time to eventually get to the improvements.

You will find that RCM practitioners will say, “Why work on your efficiency when you can eliminate the work altogether?” Obviously the right way to go....until you understand the plant will continue to have emergent work that will prevent you from completing the improvements required by the RCM analysis.

The key to gaining this productivity within the work management process is through scheduling. Everything we do in the work management process is intended to improve our ability to schedule work efficiently, and be able to hold our staff accountable for getting the work done. But that discussion will have to wait for another *President's Corner*.

