

IMWOG Conference, Las Vegas , NV

Materials Management “It’s Half The Battle!”

October 24th, 2007

A day in the life of Jim.....

- Show Up at Work



The Morning Meeting

We Had a Problem Last Night with a Pump...

...Production Rate Has Slowed Down

A Day in the life of Jim.....

- Get some coffee
- Talk to my supervisor
- Looks like were having problems with a pump!



A Day in the life of Jim.....



- Get my tools
- Check out the pump
- Looks like it needs a new coupling...

Can't find the manual and there's no BOM so...
.....Shut the pump down to get the part number.

A Day in the life of Jim.....



Head to the storeroom...

...Hey there's Bob....I wonder how his vacation went...

Long line at stores to get parts...

...grab a cup of coffee while I wait

Regular storeroom person is out sick

Can't find the part in the CMMS

Jim goes into the storeroom to search for the part.

Storeroom isn't organized or labeled very well

A Day in the life of Jim.....



The coupling isn't in stock!

Is there an interchange available?

Interchange isn't listed in the CMMS.

Look for the interchange book.

The book we need is out...not sure who has it.

Call my supervisor and ask him to call the vendor.

My Supervisor is tied up and asks me to call the vendor to order the part....says use my P-card.

A Day in the life of Jim.....

My supervisor said to put the pump back together
so Ops can use it until the new part arrives....

...But it's almost break time so I'll start it after break

Put the pump back together

Head for my new assignment.



A Day in the life of Jim.....

The part arrives 1 hour before the end of my shift.
It'll only take me a couple of hours to finish the job
...I better check with my supervisor to make
sure he'll authorize OT.

Yup... good to go...

Pick up the coupling at receiving...

Replace the coupling.



Head home...my kid's got a hockey game tonight!

A Day in the life of Jim.....

Sound familiar?.....

No Big deal right?

Happens all the time!

We did what we had to to make it happen!



What does it really cost?

1. Initial visit to job site – 15 min.
2. Diagnose problem – 5 min
3. Tear apart pump – 30 min *
4. Travel to storeroom – 15 min*
5. Wait in line – 15 min *
6. Check for alternate part – 30 min *
7. Find supervisor – 15 min *
8. Travel back to job site – 15 min *
9. Put pump back together 30 min *
10. Pick up part when it arrives – 15 min *
11. Travel to job site – 15 min*
12. Tear apart pump (again)– 30 min
13. Put pump back together – 45 min
14. Travel back to shop 15 min

Total time – 4 hrs & 50 min

“*” non-value added or lost time activities that could have been avoided.

What does it really cost?

- Almost 5 hours to complete the job.
- 3 hours of lost time
- 1 hour of avoidable overtime
- 2.5 hours of unnecessary downtime and many more of reduced capacity.

...and Jim is you best mechanic!

How many times a day down this happen in plants around the world.... How about at your plant?

What is the issue?

- The problem is obvious when we look at it in this manner but...
 - Does this happen all of the time?
 - Even for planned jobs?
- If the problem is so obvious...then why does it happen so often in thousands of plants daily.
 - Are we too close to the problem to see it?
 - Are there too many bigger problems out there?
- What would happen if we eliminate this problem?
 - Availability, Costs, Labor, Inventory, Efficiencies???

Material Management – A Strategic Advantage??

- Material accounts for 50-60% of maintenance expenditures ...millions of \$\$\$ in many organizations.
- Maintenance material is a larger expenditure than raw materials for many businesses.
- Most companies have “Supply Chain Management” Strategies in place for process material and finished goods....why not apply the same principles to maintenance materials.

Material Management – A Strategic Advantage??

- Many organizations manage materials costs by reducing or minimizing inventory which usually results in...
 - Increased total costs
 - Increased instances of “cubby-holing”
 - Poor availability and reliability
 - Poor maintenance productivity
- Integrated Material Management is a complex issue with many components.
 - Address improvement of the individual components
 - Ensure full integration of the components.
 - Work to achieve the “lowest total cost” as opposed to “lowest cost”.

Material Management – A Strategic Advantage??

- Reactive Maintenance
 - Improve speed and accuracy of repair
 - Less downtime and improved availability
 - Shorter process interruptions
- Planned Maintenance
 - Increase planning volume and speed
 - Improved job plan accuracy
 - Planned jobs are 30-50% more efficient
 - More planned jobs → more scheduled work → more maintenance resources → more proactive work → improved availability → improved customer service → increased sales → increased profits → etc, etc, etc

What can you do about it?

- Purchasing & storeroom management
- Make the demand visible
- CMMS usage & content
- The physical storeroom
- The inventory management process

Purchasing & Storeroom Management

Manage Maintenance Materials Like You Manage Production Materials and Finished Goods!

Production Process

- Production Planning/Scheduling – A lead position
- Well Organized and Integrated
- Systems Designed to Support – JIT, Kan-Ban, etc
- Process BOM and Ingredient Lists
- Integrating Ordering & Delivery
- Well Defined Processes
- Supply Chain Optimization
- Clean & Organized Storage
- State of the Art Systems
- Owned by Production

Maintenance Process

- Maintenance Planning – Not a dedicated function.
- Chaotic and Reactive
- Excess Inventories
- A roll of the Dice – Will we have it?
- Confused Ordering and Receiving
- Small and Disorganized Storerooms – many cubbyholes
- No Kitting, Staging or Delivery
- Wait in Line for Parts
- Not Sure Who Owns It
- Processes Not Defined

Make the Demand Visible

- Control the demand side of the equation.
 - Optimized and Effective PM & PdM – early detection
 - Extensive use of PdM – many technologies deep into equipment base
 - Quantifiable PM's
 - Dedicated, Highly Qualified Planners
 - Job Scope
 - Standard Job Plans
 - Parts Lists
 - Material Kitting
 - Only schedule job when all material is available
 - Material Staging & Delivery
 - Kit staging in shops or work areas
 - Hot shot delivery of emergency parts

CMMS Use & Content

- People must have access to the data
 - Train everyone – encourage use
 - Expand access point – more hardware
 - Reduce travel time
- Develop high quality data
 - Formatting – noun, qualifier and descriptions
 - Detailed technical info
 - Organized to make searching easy
 - MRO and OEM have different formats
 - Utilize digital images – tech manuals, spec sheets, pictures

CMMS Use & Content

- BOMs – The key to material management
 - Most underutilized functionality
 - Stock & non-stock
 - Planner BOM
 - Develop a process to maintain for new equipment.
 - Improves planning and repair accuracy and capacity
 - Reduces search time by 50-90%
 - Improves inventory stocking accuracy
 - Allows for sharing across equipment or sites
 - Easy identification of obsolete material

CMMS Use & Content

- Automatic BOM Development
 - Use only with verification process
 - Do not set flag on consumables
 - Establish process to add non-stock items to BOM
- Identify Cross References In the CMMS
- Link Inventory & Purchasing to Work Order and PM Systems
- Develop Standard Class & Subclass Codes
- Utilize Specification Functionality

CMMS Use & Content

- Utilize Work Order Parts Lists

Job Description	# Trips	# Crafts	Min/Trip	Total Duration	Total Man-hours
Work Order w/o Parts List	5	2	30	3 hrs	6 hrs
Work Order w/ Parts List	2	2	30	1 hr	2 hrs
Savings	3	2	30	2 hr	4 hrs

The Physical Storeroom – Questions?

Remember you are managing millions of dollars of material that can be that can keep your plant down!

- How much time does it take to find a part in your storeroom?
- How many storerooms do you have? – include cubbyholes!
- Do you know exactly what and how many of each item is in your storerooms?
- If space is at a premium are you taking advantage of high-density storage options?
- Is the storeroom neat, organized and well lit?
- Can you easily find parts in your CMMS?
- Are obsolete parts removed in a timely manner?
- Do you have a considerable amount of duplicate stock?
- Are the parts easy to reach?

A Good Storeroom – Common Traits

- Controlled access on all shifts
- Good labeling – shelves, bins, and parts
- Conveniently located
- Controlled satellite storerooms
- Well organized
- Good racking, cabinets and storage units
- Proper type and quantity of material handling equipment
- Clean and brightly lit – sealed off from shop
- Most parts can be found in CMMS limiting need to search the storeroom
- Work space for receiving, shipping, labeling and kitting

The Inventory Management Process

Can your inventory manager tell the future?

- **Conflicting Objectives?**

Make sure you have the right parts

...although we don't know which parts we'll need

...and only keep a minimum inventory!

- **Sound Familiar?**

- **Sound Impossible?**

The Inventory Management Process

Setting Inventory Levels

- **Healthy Equipment - Green Condition**
 - 80% of work is PM, PdM & Results
 - Inventory < 1.5% RAV with:
 - High levels of Reliability & Availability
 - Not Slash & Burn
- **Tighter Shared Objectives** – Purchasing & Maintenance
- **Can't reduce inventory until your maintenance process is under control.**

The Inventory Management Process

Setting Inventory Levels – 2 questions

- Should we stock the part?
- If yes, how many?

Two Parts of the Equation

- Info about the material
- Info about the equipment and maintenance strategy.

The Inventory Management Process

Info about the parts

price, lead time, vendor performance, volume discounts,
historical usage, etc

Info about the equipment

How many pieces of equipment use this part?

What is the maintenance strategy for the equipment?

Failure modes related to part, PM, PdM?

What is the effect on production if not in stock?

What is the cost of downtime if not available?

What is the MTBF for the associated failure modes?

Both must be considered to be effective!

The Inventory Management Process

The computer said we had one in stock!

- Secure the storeroom
- Use bar coding
- Utilize automated replenishment process
- Always Issue to a Work Order
- Conduct Running Inventory (Cycle Counting)
 - A= High \$\$, slow moving, critical, 20% of inventory, count 3-4 times/yr
 - B= Med \$\$, low annual usage, 50% of inventory, count 1-2 times/yr
 - C= Low \$\$, high usage, 30% of inventory, count 0-1 times.yr

The Inventory Management Process

The computer said we had one in stock!

Return Policies

- Utilize automated returns
- Insist on immediate return of unused parts
- Set expectation that proper documentation is part of the job.
- Easy to use return system
- Do not accept used parts w/o acceptance testing

Establish Performance Metrics

- Balanced Scorecard
- Spare parts value and % RAV
- ABC breakdown by SKU count and \$\$
- Cycle count accuracy
- Items added and removed – count & \$\$
- Service level – no partial credit
- Best Indicator is to observe the storeroom activity

What it could look like!

1. Review Job Plan & Pick Up Parts Kit – 15 min*
2. Travel to job site – 15 min.
3. Disconnect coupling & replace spider – 30 min
4. Travel back to shop 15 min.

Activity	Unplanned	Planned	Difference
Total Labor Hours	4 hr-50 min	1 hr-15 min	3 hr-35 min
Lost Time	3 hr	15 min	2 hr-45 min
Wrench Time	2 hr-50 min	1 hr	1 hr-15 min
Equipment Down Time	2 hr-30 min	30 min	2 hr
Overtime Hours	1 hr	0	1 hr

This represents a 75% Improvement!

Some Questions to Ponder...

- What would be the effect on your organization if you were able to achieve even half of this improvement?
- How much is this type of improvement worth to your organization?
- Is it worth investing some money and time in the proper materials management infrastructure, tools and processes required to deliver this type of improvement?

***If the answer is yes...
...then what are you waiting for?***

It's OK to Get Excited About Maintenance!

Eric Bevevino – MRG