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ASSET MANAGEMENT SOLUTIONS

...WHEN MANAGING ASSETS IS CRITICAL TO YOUR BUSINESS

Newsletter for April 2009

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This month's newsletter is part from a white paper from Ben Stevens. It will be published completely, but as noted below, trying to keep the newsletter relatively short. Ben can be reached at Ben@OMDEC.com .

To keep this newsletter relatively short, this is intended to be a broad overview of issues for physical asset management, rather than a comprehensive discussion of the topic.

Seven Steps to Maintenance Heaven?

Organizations frequently ask how to select their priorities for maintenance improvement from among the many opportunities available to them. Here we propose the top seven in sequence and indicate an approach to extracting additional value from each of them that is based on practical experience.

Introduction

Maintenance is slowly taking its place among the high priority corporate areas. Corporate executives are demanding better accountability, better control and above all, clear plans for enhancing their return on investment through better Physical Asset Management. In turn, the Maintenance Manager is being presented with more silver bullets – each promising another methodology which will "solve the problem".

Instead we suggest a return to basics by prompting the Maintenance Manager to look at those areas where the pain is highest and where the returns are greatest. No silver bullets are promised – just a straightforward approach based on years of hard-earned practical experience.

The principle behind this approach is very simple. To achieve higher reliability, availability and maintainability, there are ***only two areas to focus*** on:

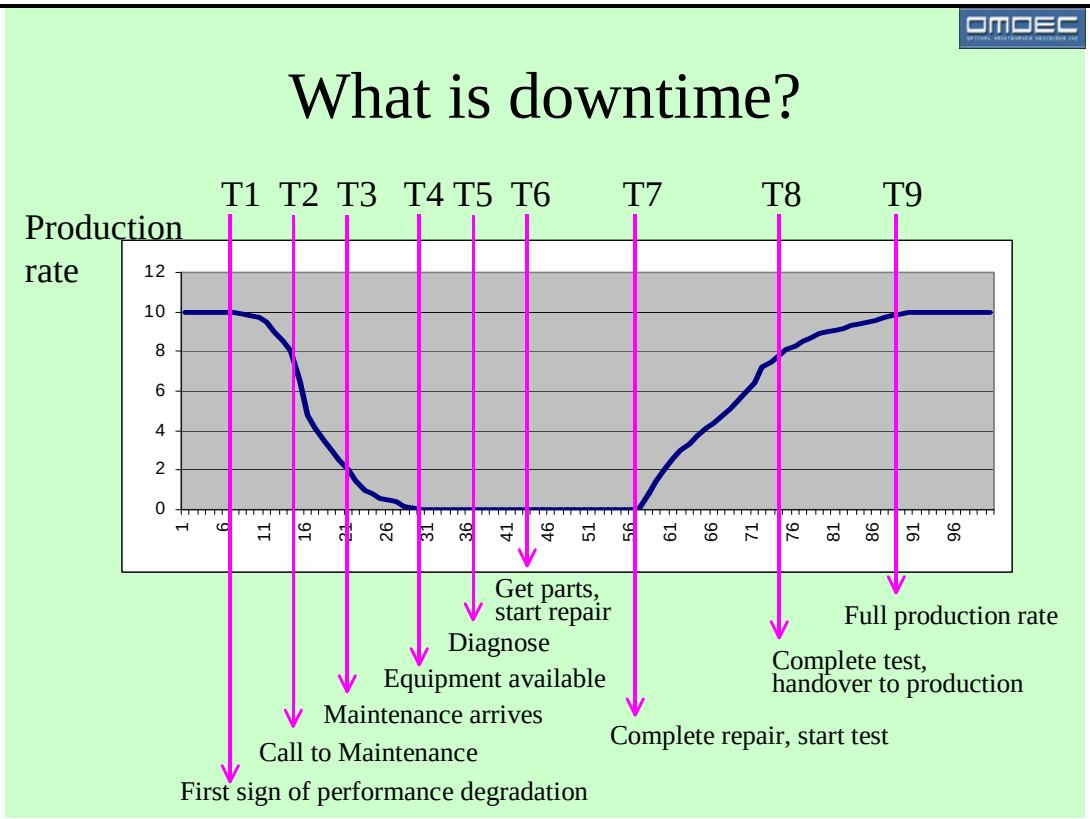
1. The capability of the technician to perform his functions (impacted by training and skills upgrading); and
2. The quality of the instruction set that he has available to him to perform these functions – the contents of the work order.

Conversely, poor instructions equal wrong tasks and poor training equals poor execution. Everything else is a subset of these two. We will concentrate on how to improve the quality of the work order by better selection of task priorities.

Step 1: Focus on Current |Breakdowns

We have all seen the statistics – that breakdowns cost huge amounts of money compared to preventive maintenance. Yet most organizations do not track failure costs with any degree of accuracy. First what is "failure". Most of us are familiar with the RCM concepts of Potential Failure and Functional Failure. And of course we all understand the impact of Total Failure. All of these are partial views of the problem. Equipment exists to produce output; its optimum performance level is what we try to maintain by a combination of proper operations and proper maintenance. Hence "failure" (in the language of the all-important executive suite) is the inability to produce at the optimum level of value.

To make this clear, the following diagram shows the multiple steps that a notional piece of equipment takes on it's journey from full value operation through "failure" and back to full value operation again.



From this it is evident that the failure period starts at T1 and concludes at T9; and the cost of lost production is the total by which the production rate falls below its desired level. Instead of looking at the lost value and working on reducing or eliminating it, we are too frequently asking "who is responsible?" (i.e. who can I blame).

However this lost production value is only one of the three major components of failure cost. The second component is the cost of repair (labour, materials, contractors, tools etc) – not only the cost of spares used in the repair, but any damage caused to related equipment, plus the cost of bringing the removed item back to useable condition, or alternatively the cost of its disposal. The third component of failure is rarely considered – this is the cost to the business caused by loss of image through failure to meet customer commitments, or escape of a pollutant or injury to an employee. Clearly this last cost component is real, but also the cost that can bankrupt the company (ask Union Carbide about that). It is also extremely difficult to calculate with any degree of accuracy and hence it tends to be ignored.

Focusing on the first two cost elements which have the advantage of being reasonably well measurable, a basic report from the company's CMMS should be produced monthly in order to concentrate management attention on the costs of failure:

Monthly and Annual Breakdown cost report

Equipment	Breakdowns - #	Breakdown - Hrs	B/D cost per hour $	B/D cost	Emergency Repair $	Total B/D cost $
#5 winder	4	16	500	8,000	2,400	10,400
Extruder	2	6	15,000	90,000	12,000	102,000

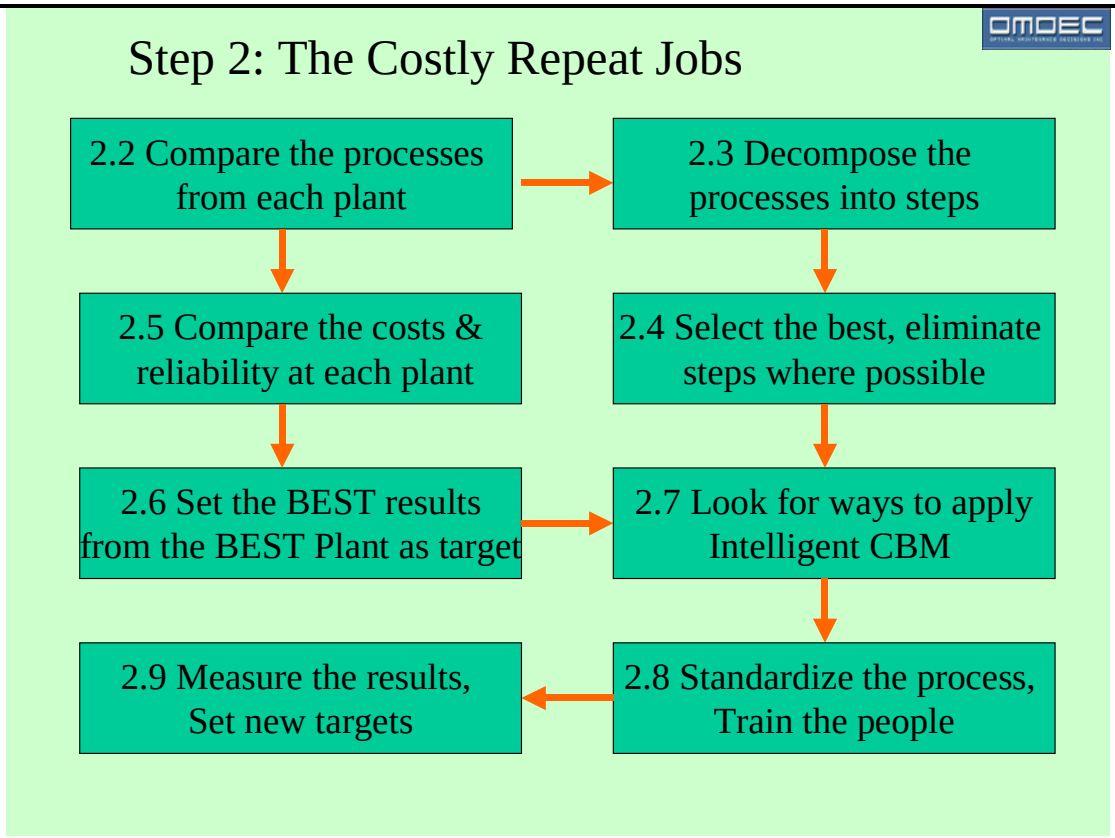
1. Breakdown cost per hour = total value of lost production
2. Emergency repair cost = labour, materials etc to return the equipment to full value operation
3. "Image costs" not included in this cost summary

From this, the familiar Pareto charts should then be prepared. However note that Pareto charts showing frequency of failure will be grossly misleading if they show only the number or duration of the breakdowns. Instead they should show the total failure cost.

The next step is for each of the high cost failures shown in the Pareto chart and the cost report, consistently undertake a root cause analysis. This must concentrate on understanding the failure cause and implementing a response that will prevent its repetition. Typically this will include a range of activities, including preventive maintenance which will be included in the equipment's maintenance plan for execution through the work order. Remember also to examine the existing maintenance plan to remove any tasks that are now obsolete as a result of these changes.

Step 2. Costly Repeat Jobs

This is particularly effective in large organizations which have multiple copies of similar equipment – frequently in many different locations. The objective here is to examine the process of repair and maintenance in the various different locations and identify the most effective tasks and methods. From this a company "best practice" can be developed for implementation at all of the locations each time this repair job occurs. The following chart summarizes the workflow in this case:



Two examples where this approach has produced dramatic results:

1. A power generation company had a time-based 4-year gas-turbine overhaul cycle. This was sequentially stretch to 6 year cycle for high pressure turbines, and 12 years for low-pressure turbines. CBM and PdM was extensively used to monitor equipment condition, resulting in a 50% reduction in maintenance work with no reduction in reliability
2. A multi-site saw-mill operation reduced maintenance costs by $3m in the first year and $10m in subsequent years. This represented a 15% reduction in costs with no increase in failures.

For any questions or comments, Ben can be reached via e-mail at Ben@OMDEC.com.

Upcoming

Please advise me, if there are other topics on maintenance management, project management, or physical asset management issues that would you would find of interest.

The C-MORE (Centre for Maintenance Optimization and Reliability Engineering) centre at the University of Toronto is organizing their 5th annual IMEC (International Maintenance Excellence Conference) conference for September 9 to 11, 2009. For more information, see: http://imec.ca .

PEMAC will be organizing their annual MainTrain 2009 conferences, this year with a new venue in Atlantic Canada at St. John's, NL. MainTrain will be in Edmonton, AB on September 28 to 30, 2009; in St. John's, NL on October 26 to 28, 2009; and in Toronto, ON on November 23 to 26, 2009. For more information, see http://www.maintrain.ca

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