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ASSET MANAGEMENT SOLUTIONS

...WHEN MANAGING ASSETS IS CRITICAL TO YOUR BUSINESS

Newsletter for May 2009

I appreciate receiving your comments on this newsletter and any suggestions for future topics. If there is someone you know who would be interested in receiving this newsletter, please feel free to forward the newsletters to them, or forward their e-mail address to me and I will include them in the distribution of future newsletters. If you wish to remove your name from distribution of this newsletter, please respond via e-mail. Please see "Contact Us" at bottom for e-mail address for feedback, comments and removal from distribution.

This month's newsletter is a continuation of last month's newsletter, a 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? *(continued)*

Step 3: Upgrade Your Use of the CMMS

The CMMS (or EAM – for the purposes of this discussion, they are one and the same), is potentially the most powerful tool a company has in its quest for maintenance cost and quality improvements. Yet it is woefully underutilized. In discussions with a utility company recently, they admitted they used only about 30% of the capability of the system – and yet they are regarded as THE most capable users among the vendor's fleet of customers. Their current campaign to raise this level to 50% is expected to reap $70m per year in benefits.

A question often asked is how to tell whether we are deriving value from our CMMS? Clearly this will be very much user company dependent; however the following self-test will provide a good starting point:

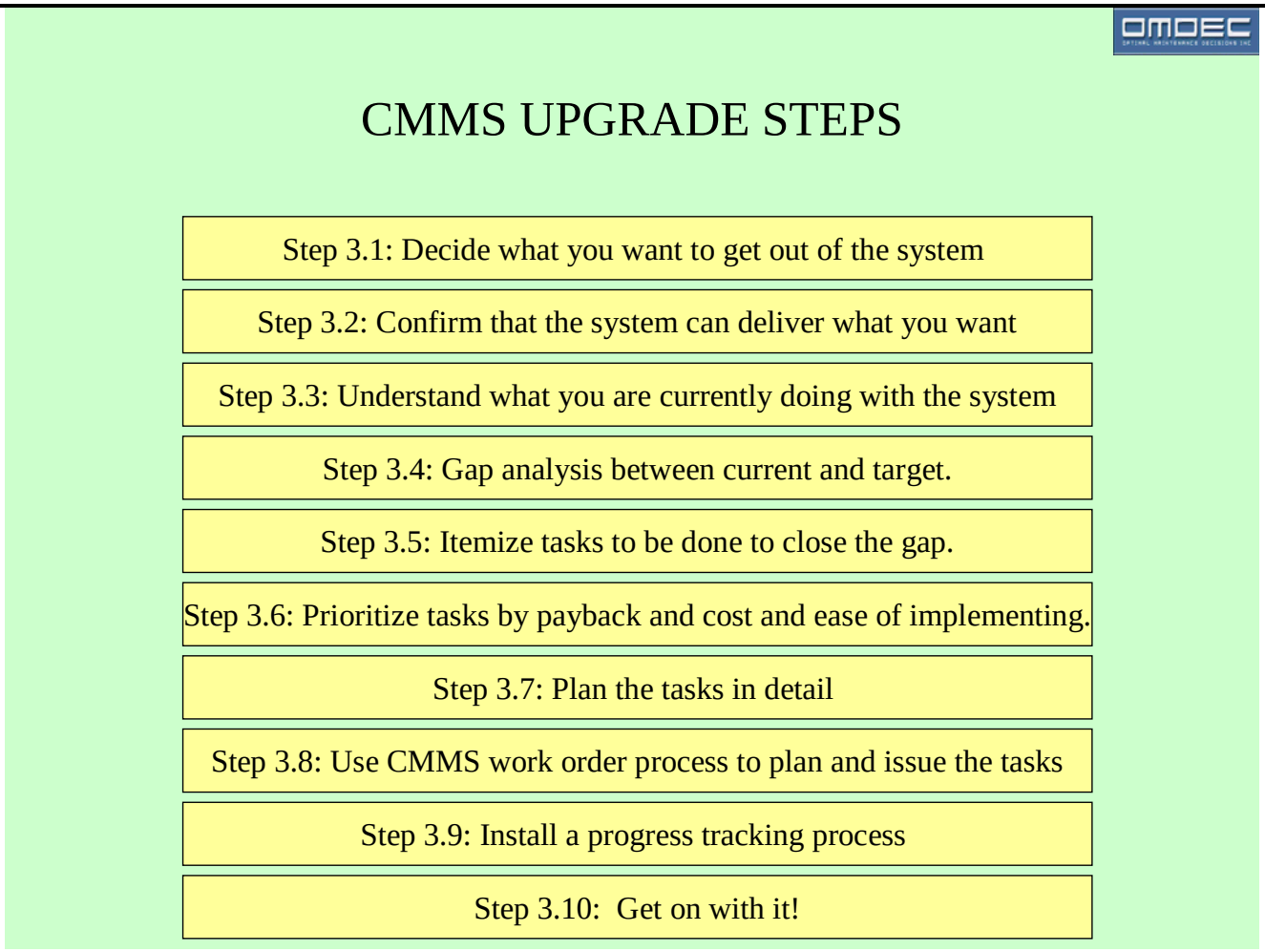
CMMS Value Self-test

1	All critical equipments are in the system	
2	All critical spares are in the system	
3	All the data is accurate and reliable	
4	All non-critical equipment and parts should be in the system	
5	70+% of your work is done against PM WO's	
6	All PM's are reviewed annually for relevance and accuracy	
7	All corrective work is done from WO's	
8	All breakdown work is recorded on templated WO's	
9	WO's collect data on material and hours used, equipment condition and failure causes	
10	All WO's make sense (according to the technician)	
11	95+% of your work is scheduled	
12	Parts pick-lists are prepared automatically from WO's	
13	Parts replenishment is driven by automatic ordering	
14	Overdue WO's are reviewed weekly	
15	All breakdowns are scrutinized to update the PM program	
16	The system prompts regular ABC counts	
17	Reports are useful and accurate	
18	The system ties into your performance management system	
19	The system prompts maintenance improvement	
20	Someone is specifically responsible for generating more value from the system	

Score yourself 5 for a perfect match, down to zero for a complete miss. A score of less than about 65% mean that you have lots of potential to improve your CMMS value

A key factor in making better use of the CMMS is the designation of an individual who has the specific responsibility to increase the value from the CMMS. This is usually a "Super User" who not only knows his or her way around the system, but also around the company and the vendor's company as well. There are very many creative ideas in the CMMS user community; attendance at a vendor's user group meeting is a great way to start. However this super user must have the support of the organization plus the authority to make improvements happen if real progress is to be made.

The following diagram shows a simplified 10 step approach to achieving the results that are being sought:



The secret here is to select a heavy cost area for the initial focus in step 3.1 – materials management or breakdown work orders for example.

CMMS's by themselves will not increase the effectiveness of your maintenance operation. It is, however, the closest we have to the concept of a knowledge base. The most advanced companies have recognised that use of their CMMS as a knowledge base provides them with the opportunity to progress to the fourth phase of CMMS evolution:

- Phase 1 – automation of forms such as work orders
- Phase 2 – automation of processes – how to automate the steps from work requests to material receipts for example
- Phase 3 – use of workflow to streamline and/or eliminate work steps
- Phase 4 – use of the CMMS knowledge for failure analysis, reliability improvement, life cycle management, quality improvement etc

Experience suggests that less than 5% of users are in Phase 4.

Step 4: Develop the "Right" Maintenance Plan for Critical Equipment

Maintainers around the world have been striving to find the right balance of maintenance activities. Intuitively we have been maximizing PM's at the expense of breakdown maintenance. And rightly so, because of the huge discrepancy in costs between the two. However recently published data has shown the high correlation between unscheduled outages and the completion of major overhauls in the power generation business – ie maintenance

causes breakdowns. At the same time, the high investment in condition-based monitoring equipment has not been paralleled by a corresponding reduction in maintenance costs. This combination has led to a re-evaluation of what is the "right" maintenance plan for critical equipment.

While there is no perfect solution to this, RCM probably comes the closest – especially if it is modified to correct some of the deficiencies that have become apparent in recent implementations. Rather than spend time re-iterating what has become a relatively well-known process, this paper will concentrate on some ways to improve the RCM process.

A good starting is the seven basic questions posed in SAE JA1011 – the de facto standard for RCM:

The Seven "Basic" Questions per SAE JA1011

1. What are the functions and performance standards of the asset in it's present operating context?
2. In what ways does it fail to fulfill it's function?
3. What causes each functional failure?
4. What happens when each failure occurs?
5. In what ways does each failure matter?
6. What can be done to predict or prevent each failure?
7. What should be done if a suitable proactive task cannot be found?

Applying these rigorously to the most critical equipments, then using the RCM algorithms for defining the task selection process, provides a solid basis for developing the right mix of tasks. Beyond these, we must address two fundamental issues which have undermined the success of RCM – namely data quality and how to keep RCM in step with your own experience.

First data quality: all too frequently, RCM is seen as a "conference room" exercise – based upon the experience of the maintainers. This must be supported by solid analysis of data, accurately and effectively collected from the field. However all data is not equal. Ask any maintenance supervisor how much historical data should be ported into a new system. The answer is very short – "very little".

Two elements need to be in place – an effective data strategy that fixes the data definitions, and an effective collection method that is reliable and easy. The CMMS should be the central depository for much of our maintenance knowledge; however the relationship between the CMMS database and the RCM database is usually both remote and purely accidental. This is because the proponents of the two tools have seen themselves in competition for scarce maintenance resources, rather than collaboratively striving to solve a common problem. A

set of simple adjustments to the work order will close this gap.

Whenever a work order is closed, we should ask a basic question – has the work added to our knowledge or the equipment and its reliability. If not, close it and file it away. If the answer is yes, then….

1. Does it represent a change in the knowledge about and an existing known failure mode?
2. Is it a new failure mode?

In either case, create a temporary RCM record for validation by the RCM team. All too often, once the RCM analysis is complete, the changes are made to the maintenance plan and the RCM analysis is consigned to the shelf to collect dust. However, each time an unexpected failure occurs, it signals not only an equipment failure, but an RCM process failure. Hence the root cause analysis and remedy should be revisited. This should set off a string of important follow-on actions:

a. review and correct the RCM logic for that equipment
b. review and correct the maintenance task in the RCM record
c. make sure the work order task is updated in the CMMS
d. check to see if the same RCM logic was used for other equipments and failure modes
e. check the work order tasks for these other equipments and failure modes in the RCM records and the CMMS.

By noting the failure mode on the work order, we can now cross-match the data with our RCM expectations and continuously validate the RCM program. Also we can now capture for analysis purposes not only the "work data", but also the "event data" that is so critical in failure analysis and failure prediction.

The typical results from an RCM introduction are well-known – a significant increase in "on-condition" tasks, and a more significant increase in the cases of "run-to-failure" on non-critical equipments and components. However even with the best RCM program, unexpected failures of critical equipment will not totally disappear.

Hence a third element needs to be introduced: to increase reliability of critical equipment failure prediction is needed. One of the problems with automated data capture is that data is now available in far greater quantities than can ever be routinely analysed. Correlating the many measurable variables with the cause of failure is a tough and demanding exercise. Frequently we find that only a handful of variables really impact failure and therefore can be used to predict failure. Upwards of three quarters of the data collected bears no relevance to failure and can be discarded or (better still), not collected. The software product "EXAKT" has been developed to streamline this process.
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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