

Condition Based Maintenance – What is the condition of Condition Based Maintenance?

By Chris Staller

I recently had a conversation with the president of a major Predictive Maintenance software company. The topic was the lack of attendance at a recent PM/CM tradeshow. While expressing his frustration, he jokingly suggested that everybody must have had the flu and instead of passing out coffee mugs, they should have given away chicken soup!

The natural question that results is whether the problem was really with the tradeshow or is something generally wrong with the Condition Monitoring (CM) industry? Sure, timing, travel costs, location and weather explain a lot. However, I believe the real prognosis may not be so clear. For the sake of brevity, I'll assume we all know the differences between Preventative (scheduled) and Predictive (condition based) Maintenance. I will also generalize Condition Monitoring as the use of multiple predictive maintenance technologies, both periodic and online.

As a basis for discussion, I believe that in order for a Condition Based Maintenance (CBM) program to be successful, it must first be effectively *integrated* (keyword here) with the operation/process. Historically, CM information as part of the process has been limited to 'mirrored' alarm information on an operator display via 4-20 mA or relay inputs. Worse yet, process data rarely flows back to the CM program. What results is a poor indication of condition for the operator (via the DCS) and a disconnected CBM program that fights for limited funds. Second, I believe that CBM programs must be measured by the same financial metrics as used to measure the overall process, i.e., productivity, contribution to profitability, effects on the cost of capital, etc.

By effectively integrating CM information with the operation, the cause-effect relationship can be quantified, creating 'condition indicators', which can then be treated like any other process/control variable. By condition indicator I do not mean annunciator type alarms, rather more detailed information such as; CM history for a particular machine or train, required maintenance actions and their costs for a particular condition and the effect on the process if the condition is allowed to continue. Once quantified, it is easier to qualify the financial effects on the process. A Condition Monitoring *program* can not become a successful Condition Based Maintenance *practice* unless the links to the operation are made and the financial metrics determined. And there lies the challenge...*program to practice...integration to condition indication*.

If you were to look at the growth of CBM sales world wide, the market has been relatively flat for the past 5 years. Some industry experts peg the current growth rate of our industry between 4-6% per annum, while others see it in the 2-4% range. Maintenance programs that were once responsible for the cost reductions and productively improvements of the 'reengineering era', are now subject to the same cost cutting. Unless CM becomes a value-added asset integral to the operation (not a P&L cost item, subject to reduction), I do not envision these growth rates changing.

Note this transition will have to be a shared responsibility between the supplier and user. If the customer doesn't begin to demand the solution, it is unlikely to occur naturally or in time. I should also mention in order for maintenance to become part of the 'operating philosophy', we must experience an equivalent to Deming's TQM revolution where 'quality is designed in and continuously improved upon.' That is, CBM must become part of the corporate culture vs. a cost item only. Once this occurs, the financial metrics will evolve and CBM can start the P&L to Balance Sheet transition.

In summary, our industry is facing cost reduction impacts so deep that many programs will fail, reversing the success trends initiated many years ago. Second, integration with the process, both technically and financially, is still a long way away from ideal. And finally, CBM has yet to become part of the corporate

solution – a profit centered concept. In an effort to supply some vision (and hope), the next series of articles will cover the following topics:

1. Integration trends – are we going in the right direction?
2. Financial Justification for CBM – is EVA the right answer?
3. Who will be the future suppliers of CBM solutions, and will you know them?
4. Technology hurdles for integration and the trends towards this technology.

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