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At a recent maintenance and reliability conference, participants in one session were treated to a commercial sales pitch advocating a specific process as the end-all solution for maintenance. If this wasn't bad enough at a conference supposedly cleansed of all supplier influences, the advocacy was constructed on arguable examples of shortcomings in condition directed or predictive maintenance (PdM).

The presentation asserted that PdM is applicable to only about 20 percent of total potential failures and is cost effective for less than 10 percent. From the questions that followed, it was clear that the assertion, use of unsupported statistics, and specific examples created a great deal of confusion. One individual in the audience stated that his company's survey of oil refineries disclosed that most used PdM extensively and were satisfied with the results.

Is there any single "silver bullet" solution to maintenance? Should we even expect a single concept or process to be equally effective for a wide range of industrial facilities ranging from mines to oil refineries, paper mills to food processors, manufacturers to electric power generating stations--each with different types of equipment and maintenance requirements?

Is the concept of "one size fits all" equally applicable to a progressive facility seeking to fine tune a world class maintenance process as well as a facility that functions solely on reactive maintenance where fire fighting skills are valued more than fire prevention? What are the plans and expectations of companies that have already achieved "best in class" and are now refining their maintenance process to extend their lead?

Survey after survey demonstrates that progressive, experienced maintenance professionals are moving toward more PdM. When the condition of plant equipment can be measured accurately and cost effectively, regressing to visual inspections is a misuse of time and resources, not to mention hazardous to equipment. To suggest that visual inspection is a more effective means to gauge gear condition and wear than PdM technologies, primarily lubricating oil analysis, is ridiculous.

In this case, one could argue that perhaps the PdM tests aren't being conducted properly or at the correct intervals, but not that they are less sensitive to wear detection or less cost effective than a visual inspection. There is too much well-documented experience favoring PdM.

The assertion that condition measurements are applicable to only about 20 percent of total potential failures and cost effective for less than 10 percent may be correct for a specific

industry or if numbers alone are considered. However, experience suggests a different conclusion for most facilities, particularly those with a large concentration of expensive rotating equipment when condition measurements' ability to avoid failures is assessed on the basis of probability, cost, and consequences. All failures are not created equal; some are more likely than others, and some cost substantially more than others.

With that said, PdM is not the solution to every problem. In some cases predictive measurements are too expensive when evaluated against the frequency, cost, and consequences of failure. One facility changes belts on roof-mounted ventilating equipment all at once on a regular time schedule. Why? Because it is more cost effective. For the same reason, a manufacturer overhauls riveting machines based on the number of rivets installed. In other cases, proven, cost effective technology does not yet exist to identify probable failures - turbine blade failures are one example.

For the real answer to the question of a maintenance "silver bullet," look inside one of your master mechanic's toolboxes. You will find a broad assortment of tools. The knowledge of when and exactly how to apply each to gain greatest results distinguishes a master craftsman.

I suggest that the illustration extends to a maintenance program. Your best program will be the combination of practices and technology that yields the greatest results for your specific equipment and location on the road to optimized maintenance. Reliability centered maintenance (RCM), total productive maintenance (TPM), and planned and predictive maintenance (PM and PdM) are tools. There is no single "silver bullet" solution to every maintenance challenge. Knowledge of what to use and when will distinguish you as the master craftsman (or woman) of a successful maintenance program. **MT**