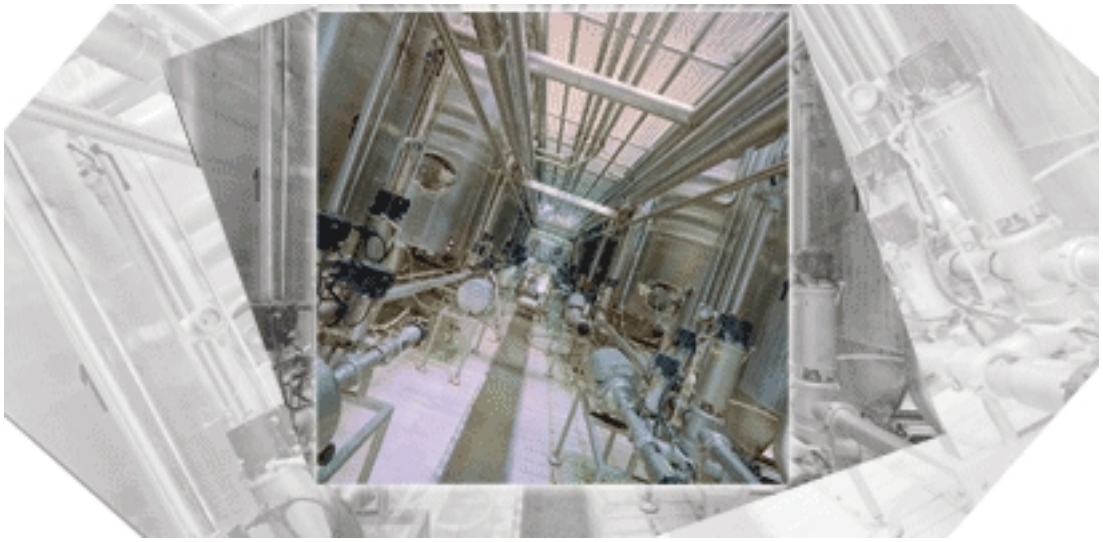

Focus in on this low-tech, high-value approach as a way to boost your maintenance performance.

The work-order priority system often goes unnoticed as a great opportunity for boosting maintenance performance. We focus our attention on big initiatives and technology, and few, if any, vendors try to sell us a new priority system. Restructuring such a system requires no technology or cost, but it's one of those little things that can really help—*or really hinder*—progr ess toward maintenance excellence.

The need for priorities

The need to manage maintenance actively is nothing new. John Day of Alumax points out that in order of preference, people would much rather work on what they enjoy, what they are good at or what they think is important—*before working on what is actually important* [Ref. 1] . W. Edwards Deming states in his Point 11 that management must implement "aids and helpful leadership"
[Ref. 2]
. The work-order priority system is this type of invaluable aid.

Nevertheless, we must see the priority system in context. Priority issues usually go away altogether when facilities begin a solid weekly scheduling effort. That's because crews noticeably complete more work. Entire backlogs typically disappear when a scheduling effort first takes off. Therefore, the purpose of the priority system is to drive scheduling. Sometimes we forget this obvious concept. So, let's discuss priorities in the context of coordinating

maintenance work with scheduling.

The result of poor coordination is less-than-optimum plant performance and maintenance productivity at only 35% (as measured by wrench time), with much work that could improve plant performance left uncompleted (whether identified in the backlog or not). The prevailing maintenance culture is: "Our job is to take care of operations, and backlog is fill-in work." What we really want, however, is world-class plant performance, driven, in part, by a productive maintenance force whose culture is: "Our job is to take care of the backlog, which will take care of operations. Urgent calls from operations means that we did not do/are not doing our job."

A plant needs a valid priority system to help maintenance schedule the right work and with minimal interruptions. This type of priority system coordinates selecting the proper work out of the backlog for the weekly schedule as a goal to promote productive maintenance work completion. It also coordinates operations and maintenance in properly selecting new work that should rightfully bypass the backlog and interrupt this week's schedule.

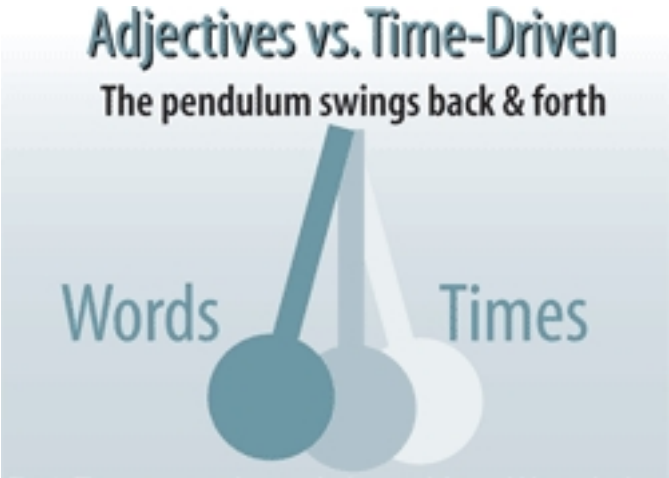

Fig. 1. There seems to be a swinging pendulum within each plant favoring adjective-based priorities for a while, then time-driven ones.

Complexity of priorities

A priority system may be too simple or too complex. An overly simplistic system would have three or fewer choices. (Many plants only have three.) Regardless of the formal descriptions, having only three choices means "Do it now," "Do it tomorrow" or "It will never get done," in the minds of the requestors.

A limited selection is the genesis of the prevailing "Our job is to take care of operations, and backlog is fill-in work" maintenance culture. The morning meeting drives the maintenance work

for that day. Nearly all the new work orders are level two. We need five levels to drive the planning and scheduling process. (More levels than five are okay because they extend the use of the full five. In other words, even if no one ever picks a 10, more people pick a 4 or 5.) While many other plants may think they have more than three choices, in reality, they only have three.

Consider these commonly used choices: Safety, Emergency, Urgent, PM, Routine, Outage. This system appears to have six choices, but PM is not a priority; it is a "Work Type." Outage is not a priority either; it is a "Unit Condition." Furthermore, Safety is also not a priority—*it is a special consideration we might call "Priority Type."*
Obviously, not all safety concerns have the same urgency. Be careful blending in areas of concern (such as Safety, Environmental, Availability, Efficiency and Legal, to name a few) that should be separate issues or fields for sorting. Thus, a seemingly sophisticated priority system of six choices may only have three in practice. This is too simple.

On the other hand, priority systems can become too complex. We just cannot seem to keep ourselves from overcomplicating something if we get the chance. The primary culprit seems to be adding other inappropriate codes as discussed above, but to an extreme of having 15 or more choices. Even without inappropriate codes, adjectives seem to multiply, describing a multitude of different scenarios for various equivalent senses of urgency. Some plants that use a time-driven system also split fine hairs with choices of 1, 2 and 3 days; 1, 2 and 3 weeks; and 1, 2 and 3 or more months, etc. There is nothing wrong with using either an adjective or time-based system (or some combination of the two), but the system should facilitate communication. In addition, some of the adjectives should contain at least an expectation of time. There seems to be a swinging pendulum (Fig. 1) within each plant. Adjective-based priorities may be favored for a while, then the pendulum swings in favor of time-driven ones.

Even with appropriate adjectives or times, systems with too many choices encourage users to avoid reading and simply choose a more urgent level, fearing that maintenance will never complete other work. Furthermore, it is very difficult to reason why a work order would require, say, a priority of two months instead of one month. In addition, beware of "aging" strategies where, over time, a work order's priority rises. A squeaky door will never be more important than a boiler feed pump—*no matter how long the door has been squeaking.* (Moreover, the improved productivity in weekly scheduling makes aging a moot point.)

Another potentially complicated system is a RIME type. These systems bear some responsibility for taking the decision away from the user by factoring in some of a plant's predetermined knowledge of asset criticality, work-type importance or other factors. RIME stands for the Ranking Index of Maintenance Expenditures, originated by Ramond Associates in Chicago in

the early 1980s [Ref. 3] . Many CMMS tools automatically provide such a calculated priority.

A RIME type system might multiply the predetermined asset criticality (1-10 with 10 the highest) by the work type criticality (1-10 with safety the highest). Two issues with this system might be the possibility of overlooking safety. A safety work order involving potential death on a non-critical asset might score only a 10 (1 x 10) while a PM on a supercritical piece of production equipment might score a 20 (10 x 2). Simple communication also breaks down with complicated priorities. It is more difficult to explain why one person's work order only scored a 30 while someone else's scored a 60.

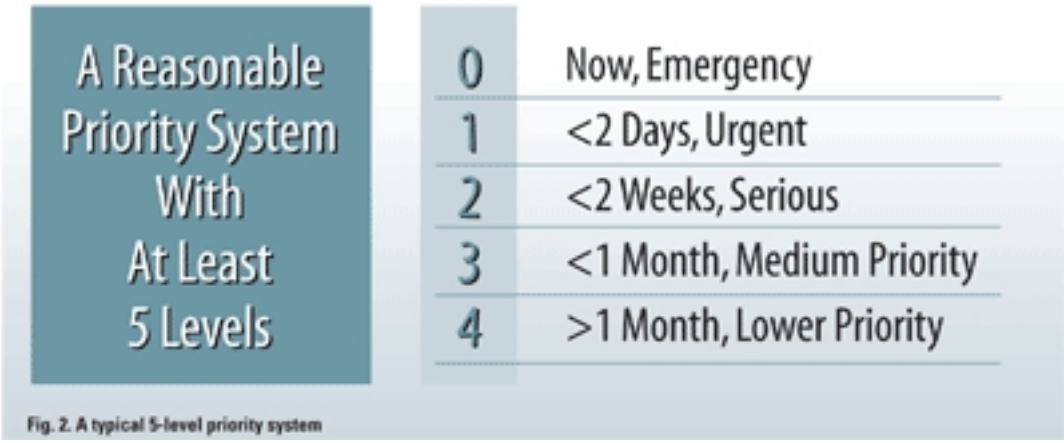

Fig. 2. A typical 5-level priority system

With this in mind, an effective system should have at least five levels (but fewer than 10) with a straightforward (non-multiplied) structure. There seems to be a tradeoff between the science of better determining the "true" relative priority of work using more complicated systems, and the ease of discussing the relative priority using simpler systems. Priority systems should also contain at least an expectation of time. Consider Fig. 2 as a decent system: *0-Start now. 1-Complete in two days. 2-Complete in two weeks. 3-Complete in a month. 4-Takes longer than a month.* Including a few descriptive words helps, but don't overly confuse the levels with areas of concern (such as Safety) without qualifiers. The 5-level system offers enough choices to encourage selection beyond this week, but few enough to promote easy discussion. The requester should select the initial priority because he/she sees the problem and knows how fast it is leaking. However, because the requester might not have a feel for the big picture of other work in the backlog, the plant should allow persons to challenge the priority later. Managers and supervisors in a short morning meeting can scan and easily discuss new work orders saying, "This is not a 2, it ought to be a 4."

Managing with priorities

Consider a plant that uses a simple system to manage coordination. In the example 5-level system (Fig. 2), Priority 0s and 1s are defects to be driven out by management. The need for maintenance was not discovered in time to plan and schedule the work. Management develops Pareto charts to see the most common causes of the defects whether they be from engineering (not replacing troublesome equipment), operations (not operating correctly), maintenance (not fixing things to last), or management itself (allowing abuse of the priority system).

Some tips for using a 5-level priority system include considering work with the same priority and PMs, as well as some other ideas to make the priority system more acceptable. Making the priority system acceptable for use coincides with making the weekly schedule acceptable (our overall context to begin with). Among equal priorities, schedule either oldest work orders first or largest work orders first. (The first way helps consider the aging issue better.) The exception is that PMs always come first amid equal-priority work orders. Maintenance PMs generally should have at least two weeks to complete, which allows for better placement in the weekly schedule. (This preference places a burden on operations to do any weekly or daily PMs.)

Weekly schedules should follow the priority system, but should include less-urgent work orders for common lockouts. It is also okay to have production, maintenance-supervisor and manager input in the schedule, based simply on preferences. But, schedule 100% of labor hours available; don't rest with only the preferred jobs. Encourage requesters of new work not to declare false emergencies by selecting priorities 0 or 1—*but never prohibit their use*. If a real emergency arises or urgent work can't wait, a 0 or a 1 is appropriate. The work is what it is. Later, during execution of the weekly schedule, inform everyone that it is acceptable to break the schedule—
but that any work breaking the schedule should be a 0 or a 1.
Management must later analyze the 0s and 1s and relentlessly manage them.

Planners should plan work orders within half the time allowed to complete them, i.e. plan a Priority 1 within one day (in our example system). Never insist that a crew wait on planning or scheduling to work any job. The weekly schedule only succeeds in improving productivity when crews are allowed to break it. Oddly, productivity rises even when the weekly schedule isn't fully met. We meet success in improved productivity—*not in perfect schedules, plans or priorities*. We aren't just trying to complete the right work with the priority system, but more of the right work.

Conclusion

Granted, many plants that have extensive complaints about their existing priority system may

not have a very productive maintenance force. When a maintenance force begins weekly scheduling in earnest, many operations see their complaints shift to finding enough work to keep the maintenance force busy. The conundrum is that without a decent priority system, it is hard to begin the weekly scheduling effort. The lesson is to go ahead and create a simple workable priority system—then start weekly scheduling as soon as possible.

Don't be taken in by a pretty face. A sophisticated priority system is not "the answer." The answer is to do the right maintenance at the right time. To make this work, we must identify enough of the right work and coordinate it with a productive maintenance group. Using a simple priority system can go a long way in helping you coordinate and boost your maintenance effectiveness. **MT**

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