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Do We Really Need Preventive Maintenance?

"Sure, I know. Preventive maintenance (PM) helps avoid unplanned downtime or breakdowns. But PMs take a lot of time, cost a lot of money and don't seem to make that much difference in the way our equipment runs. We've got excess capacity anyway, and we're not running production on all shifts during the week. So, the downtime and repairs aren't costing us that much in lost production. We're able to keep up with customer orders. I really don't see why we need to spend time and money on a PM program."

The above statement, by the head of manufacturing, has assured the senior management team that maintenance is under control despite the prior recommendations from the maintenance department for improving their PM methods. Unfortunately, this way of thinking sets the stage for a "run-to-failure" and "emergency-repair" work culture in the plant. But if plant capacity isn't a problem and all customer orders are being filled, why change? Good question.

As his following statement makes clear, that same head of manufacturing does believe in safety:

"Workplace safety has to be more than the required employee training classes. We must make everyone aware of what causes accidents and injuries and develop ways to prevent the actual causes. The safety department can only do so much, and they have. Everyone must behave differently in the future IF we are to improve our safety record."

This passion for safety has led to significant improvements in the prevention of accidents and injuries of all types in the plant.

Do you suppose there's a common thread connecting workplace safety and preventive maintenance? What would happen IF we could improve workplace safety AND equipment reliability through preventive strategies? What if we couldn't?

PM makes good business sense

Why carry out PMs if the business does not seem to justify the time and the expense? PM for the sake of PM is not a good justification. There has to be more to it. The plant mentioned above has been plagued with financial problems and market-share losses. In the past year, it's made significant strides in regaining lost

business and reducing costs. It has a good sized maintenance group—mechanics, electricians, fabricators and a manager—with years of experience, and has recently spent time reorganizing its shops and storeroom as part of a "5S" effort (workplace organization and orderliness). It also has spent time improving setup/change-over of a few small pieces of bottleneck equipment. Therefore, it IS improving maintenance...isn't it?

The term "maintenance" typically means sustaining or preserving a desired condition or level of performance. However, in this plant, the term "maintenance" means fixing things that break—*doing the needed repairs*. Here, "maintenance" also means building things and fabricating modifications to the equipment and the facility. It can be extremely difficult to comprehend the need for a "preventive maintenance" program with this "maintenance" paradigm. So, the plant is stuck with what it's got...or, maybe not...

Let's take a clean-slate look at maintenance. What should maintenance be and do? Here are a few key points:

1. The top priority of maintenance should be to preserve the equipment and facility conditions (some would call this "mission-ready" condition). Regardless of WHO performs the work, keeping equipment and facilities in good shape is a foundation for market competitiveness. Furthermore, good maintenance protects the investment of owners and shareholders. Over the years, first-hand experience and studies have shown that reactive/repair-based maintenance costs the business 10 to 100 times more than preventive maintenance.
2. The priority order for maintenance activities should be noted as follows: 1) preventive; 2) planned repairs; 3) problem-solving; 4) improving; 5) unplanned/emergency repairs; 6) setup/changeovers; 7) fabrication; 8) installation projects. If the maintenance team doesn't have time to perform preventive maintenance, planned repairs and problem-solving, it has no business doing fabrication and installation projects. This type of approach just keeps digging a deeper emergency-repair hole. Unfortunately, "unplanned/emergency repairs" have a way of moving from #5 priority to #1. That's all the more reason for focusing on the top four priorities—to eliminate unplanned/emergency work.

3. "Maintenance" as a noun usually refers to an organization or a group of people who maintain something (the "maintainers"). "Maintain" is a verb, an action that sustains or preserves desired conditions—*assuring equipment reliability*. Many people assume that the action of maintaining is exclusive to members of the maintenance group: This is a dangerous assumption, since the actual causes of poor equipment performance are frequently outside this group's direct control. Moreover, many routine PM-type inspections are performed best by the operators who are closest to the equipment.
4. The top business-policy priorities in a capital-intensive operation include health, environmental, safety, quality and equipment and facility reliability—*not five separate priorities, but five equal priorities*. Be careful with the politically correct statement "Safety is our top priority here." Stringing these priorities in linear fashion can be conveniently numbered: 1, 2, 3, 4, 5. In reality, business demands a systemic perspective. That is "health AND environmental AND safety AND quality AND reliability."

Workplace safety is a maintenance & reliability program

While industrial maintenance typically applies to tools, equipment, processes and facilities, "workplace safety" typically applies to people interacting with tools, equipment, processes and facilities. Workplace safety is, therefore, a "maintenance program" focused on preserving or sustaining the desired conditions of an accident- and injury-free workplace and healthy employees—a "preventive maintenance program" focused on the reliable, safe job performance of people. There are rules, regulations, policies and procedures documenting what is expected and required for good workplace safety. There are employee-training and refresher training classes, checklists and documentation of certain critical work activities (job-safety analyses, confined-space entry, welding and cutting permits, etc.).

1. Everyone is involved these days. We now know that workplace safety is no longer solely the responsibility of the "safety department," but rather the responsibility of everybody in the plant. And workplace safety must have clear expectations and accountabilities set by senior management. A "safety policy" communicates the importance of the company's workplace safety processes. Business leaders, union leaders and employees at all levels know the importance of workplace safety. Even so, there are varying degrees of workplace safety in today's plants and facilities.
2. We measure workplace safety through lost workdays, accident/injury severity and so forth. These are lagging (after-the-fact) indicators likely indicative of future performance-improvement opportunities.

3. There are also proactive safety programs and leading indicators, including hazard identification and elimination, "near-miss" reporting (which is a misnomer—it should be "near hit") and DuPont's famous "STOP" program (Safety Training Observation Program) designed to increase awareness and promote safety communications. Companies using these methods and measures of workplace safety are attempting to not only preserve (maintain) desired safe work conditions but also to improve the conditions of workplace safety. Hazards and unsafe acts are identified, addressed and quantified before they turn into accidents and/or injuries.

The business costs of inadequate workplace safety

Accidents happen, people get hurt. An unsafe workplace is not only harmful to people, it's expensive. In addition, these increased costs (losses) go well beyond federal and state fines for violating regulations.

Let's briefly look at the impacts of a reactive safety program. . .

- Accidents (*costly equipment and facility damage*)
- Injured personnel (*unplanned medical costs*)
- Increased overhead (*fines, medical expenses, health insurance, workers' comp insurance*)
- Reduced productivity (*lost work days, light duty work, medical leave*)
- Increase in poor attitudes and morale as injuries increase (*productivity declines*)
- Increased turnover (*hiring and training costs increase*)
- Increased costs of goods/services sold (*price increases/lost profits*)
- Interrupted workflow (*orders not delivered on time*)
- Disappointed customers (*possible loss of market share*)

The business costs of inadequate PM

Lack of adequate preventive maintenance can be a huge unpredictable cost to the business—the same as when workplace safety suffers. The lack of adequate PM costs more than merely making the repairs. Poorly maintained equipment is frequently an accident waiting to happen. People often get injured while making emergency repairs and during the aftermath of cleanup. So, add the previous list to the following costs of inadequate preventive maintenance or a reactive maintenance program:

- Increased repair labor costs (*unpredictable/uncontrollable*)
- Increased OEM technician costs (*unpredictable/uncontrollable*)
- Increased overtime (*unpredictable/uncontrollable*)
- Increased spare parts and inventory costs (*unpredictable/uncontrollable*)
- More expediting of repair parts (*increased shipping costs*)
- Deferred or cancelled planned work (*reduced productivity*)
- Poor attitudes due to emergencies (*productivity declines*)
- Increased damaged-, defective- and/or lost-product rates (*increased costs, lost efficiency*)
- Interrupted workflow (*orders not delivered on time*)
- Increased costs of goods/services sold (*price increases/lost profits*)

- Late shipments (*customer penalty/fines*)
- Disappointed customers (*possible loss of market share*)

The investment in PM pays big dividends. A recent example shows unplanned downtime was reduced by 18 hours per month by spending just \$508 on PM labor and materials, with 6.16 planned downtime hours monthly. This led to an astounding savings of \$115,536.50 per month—and an additional \$53,280 in production output per month!

Take this to the bank

Although preventive maintenance makes sound business sense, some decision-makers still don't understand its benefits—or the losses associated with reactive repairs. In tough economic times, not to mention an era of maintenance skills shortages, a strong, economic case for improving PM effectiveness can be easily made: Numbers don't lie. Businesses that ignore the advantages and profitability of preventive maintenance will continue to struggle and/or miss their true potential in the marketplace. **MT**

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