

## Ten Key Questions

### How well is your company doing in maintenance and reliability?

In May, I was a panelist at the Maintenance and Reliability Conference (MARCON) sponsored by the Maintenance Resource Center (MRC) at the University of Tennessee in Knoxville. The question asked of the panelists: **How do you determine how well your company is doing in maintenance and reliability?** My response prompted a healthy discussion and numerous requests. I share my response with our readers in this month's column.

Let me start out by saying that "maintenance" alone cannot make equipment and processes reliable because the maintenance department is not in control of all of the causes of unreliability. Quite often, the maintenance department is reacting to maintenance and reliability problems caused by decisions and/or actions of other departments. Further, in high-reliability plants, the maintenance department is not a "supplier" of maintenance services to the operations group "customer" but rather a "partner" with the operations group for improving equipment and process reliability. Given this perspective, I would ask ten questions to answer the question: **How do you determine how well your company is doing in maintenance & reliability?**

1. **How close to 100-percent reliability are your critical, constrained, high-risk equipment and processes? Are they doing what they are supposed to do first time every time?** (The correct answer is "Yes.") One hundred percent is attainable, desirable, and the right goal for truly critically important assets. A racecar that completes a 500-mile race within the planned finishing position is "reliable." But don't confuse "reliability" with "availability." One hundred percent reliability means that it does what it is supposed to do the first time, when needed, with no unplanned downtime. Planned downtime for necessary preventive maintenance to improve or sustain the process reliability will reduce the calendar time availability.
2. **Is your reliability program driven by operations management versus the maintenance department management?** (The correct answer is "Yes.") Reliable equipment as part of a process generates revenue and/or avoids penalizing costs in the cases of health, safety, and environmental incidents. Unreliable equipment stalls a process and prevents revenue generation and reduces "return on capital assets."
3. **Are equipment and process performance data routinely collected and analyzed, root causes determined, and corrective actions implemented and verified versus tracking and trending OEE calculations and other metrics' percentages?** (The correct answer is "Yes.") So often, we become enamored with relative numbers (percentages) that are several levels removed from the actual results and the reasons or causes of good or bad performance. Numbers can look good, but the actual results are not so good. For example, the OEE percentage can decline while the actual performance, reliability, costs, and output have improved.
4. **Are the "risks" of mandated budget cuts evaluated and positively addressed before the actual cutbacks of budgeted maintenance activities are made?** (The correct answer is "Yes.") A 10-percent across-the-board budget cutback can cause significant reliability damage unless the maintenance budget contains 10-percent discretionary spending on non-critical

items. Arbitrary budgetary cutbacks happen all too often: Preventive and predictive maintenance activities get reduced, spare parts get outsourced, and training gets cut. Then, the equipment breaks down more often, or downtime duration increases, costing the business much more in terms of higher unplanned expenses as well as lost revenue, lost production. Ask yourself, “how would similar mandated across the board budget cutbacks be handled in safety and environmental areas?”

5. **Does your skills and knowledge capturing process effectively prevent a “brain drain” (knowledge loss) as senior talent retires or leaves? Is this knowledge documented and disseminated as “best practices?”** (The correct answer is “Yes.”) Whether previously trained or not, the years of expertise accumulated by the senior, highly experienced maintenance personnel is an extremely valuable commodity especially in today’s era of skills shortages nation wide. If these skills and knowledge are allowed to leave the plant or facilities how are others, newer employees supposed learn how to safely, efficiently, and effectively perform the tasks of the job? There is a powerful case for “procedure-based maintenance” versus “craft-based maintenance” today, more powerful than ever in our nation’s history. Procedure-based maintenance is based on the captured, documented, and refined “best practices” that also form the basis of formal training and qualification. Craft-based maintenance assumes that given sufficient in-depth craft skills training the personnel could figure out how to perform almost any job task.
6. **Is reliability as important as safety, environmental, quality, and human resources in your company’s strategic planning and execution?** (The correct answer is “Yes.”) I have written much about this “reliability culture” concept recently. In brief, imagine the competitiveness of a plant that paid little or no attention to safety, environmental, or quality. Employees and working conditions would be miserable, communities polluted, and customers highly disappointed. (Sound like some low-wage countries?) We have national, state, and sometimes local laws and regulations that prohibit unsafe polluting workplaces. Customers dissatisfied with the quality of products and/or services can take their business elsewhere. Either of these conditions leads to high-cost, low revenue, unreliable operations. Not exactly a formula for business success. Why then is shoddiness of equipment maintenance and reliability tolerated? Unreliable equipment and processes can be unsafe, polluting, and high cost while at the same time interrupting the revenue stream of the business. The problem is, we have regulations for safety and environmental practices, customers demand highest quality for the money, but maintenance is generally unregulated and invisible to the paying customers.
7. **Are your operations and maintenance (O&M) costs per unit produced continually declining while the company’s return on assets (return on invested capital) improving?** (The correct answer is “Yes.”) Not so long ago, if manufacturing and operating costs increased, they were just passed on to the paying customer. As competition grew and global competitiveness mushroomed, businesses had to find ways to reduce costs. Cost-cutting programs prevailed in the 1980s, 90s and even today. Some businesses discovered that they could eliminate “non-value adding” costs while others “eliminated wasted efforts and inventory to reduce costs.” Sustainability of cost reduction efforts is of key importance! Changing work processes (methods and procedures) to more efficient ways often reduces costs. Successful plants have demonstrated continually declining operating and maintenance cost per

unit produced. By using fewer capital assets or making the existing assets more productive their return on net assets also improved.

8. **Do your operations managers routinely attend maintenance and reliability conferences (such as MARCON) with you?** (The correct answer is “Yes.”) Informed operations managers want to understand what it takes to improve plant and process performance and reliability, especially in capital-intensive operations. Senior executives striving to generate shareholder value truly understand the importance of a reliable operation. They read the journals; attend workshops, seminars, and conferences to learn what it takes. This enables them to lead the operation from a high-reliability perspective and make informed decisions. Are you keeping them informed? Are you sharing the latest information on what it takes to make plants and processes reliable, high quality, on-time, and low cost?
9. **Do your maintenance and reliability strategy and tactics focus on business-related results rather than on maintenance activities and initiatives in the hopes of improving performance?** (The correct answer is “Yes.”) Unfortunately, we are a culture of improvement initiatives, program-of-the-month, and business buzzwords. While some businesses have avoided these traps, many others have bought in big time. Major activities and initiatives typically consume large amounts of resources: people, time, and money. In resource-constrained businesses, this is often a gamble for sustainable improvements to the bottom line: doing more with less. An alternative approach is one of focused improvement that uses the proven tools in ways that guarantee improvements, a solid and sustainable return on the investment, rather than plant-wide implementation. Focus on specific constraints that affect the business: production bottlenecks, high maintenance costs, high downtime, problematic equipment.
10. **Does the term “maintenance” in your company imply sustaining a desired level of equipment and process performance (reliable equipment and processes) rather than fixing things, painting things, moving things?** (The correct answer is “Yes.”) We know that the best “value added” work for our maintenance group is sustaining the desired level of performance of our equipment and facilities. However, historically “maintenance” has been side-tracked into “government jobs” for upper management, building offices, changing headlights, and other odd jobs while the plant equipment suffered. Maintenance backlogs have become littered with hundreds of requests that seldom see the light of day because of reactive repairs, emergency work, and top management’s pet projects. All of this leads to the perception (and the reality) that this is what “maintenance” is all about. What if we could demonstrate the bottom-line value of “real maintenance:” preventive and predictive maintenance, planned and scheduled maintenance, proactive maintenance, and reliability-centered maintenance? What if we outsourced everything that interfered with real maintenance? I was in another plant recently where production supervision and management are penalized if scheduled PMs are missed or deferred. Their also equipment is extremely reliable because of that upper management mindset.

Creating a “reliability culture” that overcomes the inertia of the past, and overcomes the “maintenance mindset” is essential to improving the competitiveness of a capital intensive business. In many of these businesses the maintenance department does not have the

responsibility and the authority to address the reasons for equipment and process unreliability. It stands to reason that the company's senior leadership must set the stage for improving reliability in the same way they led improvements in safety, environmental, quality, and human resources management. Policies were developed and communicated, new expectations set and accountabilities established for compliance to regulations as well as conformance to principles that were promoted by the company's senior leadership.

So, how did you answer these ten questions? I'm sure we could all add more questions to ask but how long can we keep answering a question with more questions? Let's pause to think about what's really at stake here: If our maintenance programs, activities, and talents were focused on the essentials of a competitive business our plants and processes would be extremely reliable, lower cost, and more productive. Unfortunately, many of our business and governmental leaders do not understand the role that equipment and process reliability play in making our businesses and our nation competitive. While the United States has been ranked as "the most productive and competitive nation in the world" for 15 years in a row we are still losing our competitive edge. And I am convinced that much of that our diminishing competitive edge is due to unreliable equipment and processes as a result of lack of career education and training, and ineffective maintenance.

Highly reliable plants result when there is a strong sense of partnership between operations and maintenance: Teamwork focused on common goals. **Teamwork is the fuel that allows common people to achieve uncommon results.** What makes this work is the prerequisite: **Leadership creates the framework for teamwork to exist and thrive.** Let's work together in our plants and facilities to achieve affirmative answers to the ten questions discussed above.

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