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Bob Williamson, Contributing Editor For decades, our "industry" has been bringing in innovations to improve maintenance and reliability (M&R) processes. The list goes on and on: preventive maintenance (PM), computerized maintenance management systems (CMMS), planning and scheduling, various predictive/condition-based maintenance methods (PdM/CBM), reliability-centered maintenance (RCM), total productive maintenance (TPM), autonomous maintenance, life-cycle cost (LCC) decisionmaking and more.

We also have learned, as many manufacturers, facilities and utilities have, that "programs of-the-month" come and go in regular cycles- each one promising to be the "silver bullet" that will outdate all other practices. Unfortunately, as common as these programs are, they seldom work and are rarely sustainable unless they intentionally focus on compelling business results and provide a tangible return on investment (ROI) to the bottom line.

Sure, these programs typically promise an ROI based on proven, logical strategies.What many don't address, however, are the requisite work culture changes to not only embrace the new methods, but to sustain and then improve on them. *Stay tuned*.

Current and future workplace demographics suggest a challenging work culture at best. Consider the growing discussion about "maintenance skills shortages" and the need to train more maintenance and reliability technicians and professionals. We DO need to train more-*and use new and proven maintenance methods leading to lower-cost operations with more reliable equipment* .

We also need to fundamentally rethink our M&R strategies as we approach this "perfect

storm" of increasing retirements, growing labor shortages, lack of vocational/technical training programs and the "college-educated workforce" promoted by our social/academic community. Business decision-makers who perpetuate the myth that "maintenance" is little more than an overhead cost will increasingly struggle to remain competitive. This is (and will continue to be) especially true in equipment-intensive, capital-intensive businesses.

Where to start our rethinking

First. . .In most cases maintenance is not an "industry," nor should it be expected to improve its performance to grow business, profits or customers, or to prevent lost revenues. Yes, maintenance does produce capacity for the operation to generate revenues at lowest possible cost, but it can't do that alone. Yet, to view "maintenance-as-an-industry" sets the stage for a blocking assumption- *we can operate fairly autonomously to improve our performance.*

Many, if not most, of the reasons equipment does not do what it is supposed to do are outside the direct control and responsibility of the maintenance organization. For example, we have all seen very effective PM programs die on the vine because of no access to the equipment at the right time for the right duration with the proper spare parts.

Second. . .We must admit that we actually are "partners" or "joint owners" of asset reliability because (again) "maintenance" cannot do that alone. The maintenance group is generally part of a larger business organization- *not an autonomous, stand-alone business.*

For a manufacturing-, utility-, transportation- or facility-type of business to be successful (market-responsive, agile, low-cost and profitable) its assets (equipment and facilities) must perform as intended first-time, every-time. This means the business must focus on improving ALL groups that affect asset performance and reliability.

Consider the impact of other groups on your M&R efforts: design engineering; installation, startup and commissioning; procurement/purchasing; process engineering/control; quality control/inspection; MRO parts & supplies; operations; human resources/training; safety & environmental and others.

How can a maintenance organization be responsible for improving equipment performance and reliability without fully engaging these other groups? Does this explain why many

maintenance improvement programs have failed to deliver sustainable results?

Gaining a new understanding

The sooner that our business decision-makers truly understand how equipment-intensive operations generate revenue and profits, the more competitive their operations will be. On the surface it does not seem too difficult to understand. But, it's easy to see why there is a disconnect when you consider the amount of time these decision-makers typically spend dealing with equipment performance cause-and-effect improvement compared to the "glitzy" programs that continue to swirl around out there.

It's time for decision makers to unite! Let's get our plant managers, general managers, executives, boards of directors and company owners to "think inside the box" for a change, and discover what truly affects asset performance and reliability. Then, let's encourage them to take decisive leadership action to focus the typically separate groups' activities on eliminating equipment losses and problems in cross-functional team approaches.

The leadership behaviors we see in NASCAR Nextel Cup teams should serve as a model. If a team's equipment (racecars) are poor performing and unreliable, not only do their costs increase, they lose races and sponsors- the equivalent of losing markets and revenues because of higher costs and unreliable ontime delivery.

An equipment-intensive operation must have reliable equipment to compete.Maintenance, being less than 10% (or so) of the organization, cannot overcome equipment problems that emanate from the other 90% of the organization. If we expect maintenance to do it alone, we are liable to become a highly reactive, repair-based operation with increasing interruptions, costs and lost revenues. If we want to make our plant (or facility or utility) a more desirable place to work, we all MUST focus on eliminating equipment problems. Ponder that for a while. . .

In a work culture where everyone who directly and indirectly affects equipment performance and reliability focuses on preventing- even eliminating-equipment problems, there is less finger-pointing, less blame, less frustration. And, fewer maintenance technicians, maintenance specialists, and reliability technicians will fall prey to the "fixing things fast" syndrome. In reality, with fewer equipment problems and more reliable equipment, more real maintenance work can be accomplished with fewer people than in a highly reactive maintenance environment.

Procedure-based maintenance training

It's now time to beat the TRAINING drum as loud as I can! Without formal structured training, workers at any level are left to their own devices or assumptions to figure "it" out. This is NOT a way to operate a competitive, safe, environmentally-friendly, profitable business, be it a manufacturing plant, commercial, residential, resort,medical or academic facility or utility (i.e., electricity generation, water treatment, wastewater treatment, telephone). Sadly, many companies have given training short shrift-*years of down-sizing and cost cutting have taken a real toll.*

For example, experience has shown that detailed, procedure-based operations training results in error-free production. Maintenance training, though, is based on the assumption of proficiency in a skilled trade or craft, with little use of detailed procedures. Back in the days of sound apprenticeship training under the guidance of a Master Craftsman, this type of strategy worked. Today, however, without apprenticeship training and without being mentored under the tutelage of Master Craftsmen, how can we expect our maintenance workforce to ever be proficient and effective using out-dated craft-based approaches to completing their assigned tasks.

Now is the time to embrace procedurebased maintenance and to use those same procedures to train and qualify our maintenance technicians and mechanics.We need to move people away from simply "figuring things out" into the mode of "following the proper procedure." In an advanced manufacturing environment, in a reliable utility, in a first-class facility this makes sense. Do this and we can open up the door to many more people to enter maintenance and reliability as a career.

Public schools

Now, too, is the time to again focus on two tracks in our public schools: academic/college bound and career/technical education. Both can be accomplished in our school systems, just as they were in the past. Educating and training students for post-secondary success can be done at a college,
university, technical school or on the job.

Teachers, counselors and academic leaders should be encouraged to reflect on the success rate of their graduates.What's wrong with 50% of high-school seniors going on to four-year colleges or universities, 40% going to post-secondary technical schools and 10% going directly into the workforce?

Business and industry must implement various programs or initiatives to attract students' attention while they are still in high school. Co-op programs, apprenticeship programs, school/work programs introduce students to the world of work while they are in a position to be thinking about career decisions. Business and industry must actively share behind-thescenes activities with the community, schools, teachers, students, and parents.

Partnerships for reliability

M&R professionals must master "partnering" skills in the workplace. Communicating the causes of poor equipment performance and equipment-related losses without "blaming" can go a long way toward improving organizational performance. Collaborating on countermeasures that eliminate the root causes of poor equipment performance and contributing to best-practices procedures will lead to worldclass levels of reliability.

At the core

Finally, it is time to fundamentally rethink maintenance and reliability as a core business process in equipment-intensive operations. The key is to create partnerships-or teams-that abhor unreliable and poor-performing equipment and facilities.

Much of our future pivots on a precarious pinpoint axis of reliability. How much longer can the maintenance organization alone control this balance? **MT**

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