COMMON-SENSE RELIABILITY IMPROVEMENT
Creating a Learning, Bridge-Building, Precision Maintenance Organization
One of my old superintendents used to hook his thumbs in his suspenders and say, “Son, in manufacturing, you’re going to have three disasters a day. If it’s 2:00 PM and you haven’t had one yet, it’s not a good day. It’s a long day.”

Back then we were all impressed with what a wit he was, and how manly we all were to work in such a swashbuckling industry. Today most of us know that the super’s style of stopgap management and his chaotic world view caused many of the disasters that shaped our environment.

To be fair, my old boss didn’t invent chaos, but he did serve to perpetuate it. After all, as long as the chaos was deemed to be inevitable, it couldn’t be the result of his or anyone’s sloppy management. Back then, manufacturing guys were tough, and we proved it by working a whale of a lot of overtime to clean up the messes we made on straight time.

Factory change is accepted today as commonplace, but back then, trying to make sense of the plant environment was viewed as “unrealistic” by experienced hands. “Here in the real world,” their explanations would begin, “we know better than to think it will get better.” Who could argue with Murphy’s Law?

In the new millennium, effective trainers and consultants are aware of the need to bring middle management up to speed with whatever change is being installed. Failure to do so even has a name – “rainbowing.” To build a rainbow, you sell a lovely new idea to top management, then leap over middle management and try to indoctrinate the front line workers without bringing supervision along first. Rainbowing is an almost sure prescription for failure. In fact, to avoid rainbows, the most effective programs not only bring middle management along, they
secure help from middle managers to customize the program to fit their organization. These are, after all, the men and women who make their living implementing instructions in their plant. Of course they would also be the experts in making new ideas work.

Anyone, worker or manager, learns best when classroom instruction is mirrored in simultaneous workplace changes. When change agents are careful to obtain middle management help, this synergy of workplace facts and classroom ideas can be wonderfully effective. It can easily erase the whole set of arguments that begin “Here in the real world none of those newfangled ideas will work…”

Best of all, managers who are prepared to listen to workers about their successes can create a second wave of benefits. This is particularly true when new technology is involved. Managers need only ask one question – “Now that the new techniques or technologies are working, what other opportunities do you see to apply them to our business?”

If this question is asked in the right moment of excitement over the success of new tools, it can create what I like to call “training-driven innovation.” When people who understand both the factory and the new tools install their own ideas, the resulting changes will have 100 percent ownership by the team. Not only do the workers who conceived the improvements own them, but the managers who asked the question are life members of the innovation team. A solid bridge will have been built, with two-way traffic bringing innovation to the workplace and returning with even more innovative ideas.

The bridge system works very well, but it is far from automatic. The proper combination of training and process changes must be developed and delivered to the workforce in a coordinated fashion. This is both essential and difficult, since data gathering and analysis technology have outstripped the training offered by most employers. As a result, condition monitoring data are often gathered, but do not receive the attention they need to help users to reap the business benefits of all the information they are paying for. This is often due to a mixture of training failures.

A technician in the company may know how to use condition monitoring equipment and generate the data to predict process equipment failures. Unfortunately, he or she often doesn’t really know how to read the data and create useful information for management. Or, in cases where good, useful information is being created and transmitted, management often doesn’t know how to react to the readings provided by the technicians. Since there is no reaction to the data, failures proceed as predicted, creating reactive maintenance and other forms of chaos.

When this happens, the company is already spending 90% of the time and cost required to develop the information that is needed to improve maintenance and reliability. It is only necessary
to introduce the people with the information to the people who need it and add enough training so that the techs understand their data and management understand their techs. This is the kind of situation that consultants live for. The money is being spent, but the benefits are not being reaped; so a small fix can yield great results.

In 2013, almost any company has some measure of this problem/opportunity. A consultant, or anyone else who wants to help and look smart in the process, can follow three steps to identify this situation and capitalize on it:

First, Find the Data – See who is responsible for reliability and condition monitoring and find out what data they are generating. They’ll be somewhere in the reliability, maintenance, and production organizations, and they’ll be all too happy to let you know what is going on. After all, they’re probably spending their time developing and storing data that has great potential and that nobody is using. Develop a record of what data they have and what they think the potential is for it. Hopefully there will be multiple sources. Find them all and add to your power and information base.

Next, Identify Opportunities – Work with the techs you have just met and your production or production control people to identify production losses for the last year that were caused by equipment failures. See whether the failures were predictable from Condition monitoring data and what had been done to alert the production and/or maintenance organizations to the problems prior to the failures. Determine whether the right equipment was being monitored. If there is someone in the organization calculating and publishing overall equipment effectiveness (OEE) enlist him or her immediately. OEE uses much of the data you need. It also includes capacity losses due to equipment condition. Join forces with the OEE team and use their information to supplement the failure data you have unearthed.

Chart the data flow that was supposed to have occurred when impending failures were identified. Determine what portion of the data flow failed to create corrective action. Estimate, if possible, the value to the company that having the right information in the right place would have delivered. This doesn’t have to be to three decimal places and company-wide. You just need to show that data gathering is taking place (or could take place if people understood the opportunity) and that the data could be used to improve reliability of production equipment. Usually that is not very hard.

Finally, Plan and Execute the Fix – Typically Condition monitoring information is gathered and analyzed by maintenance and/or reliability. It is then packaged by reliability and passed to maintenance and production management for action. A small group from these functions should, in one or two meetings, be able to agree on the data flow that will be required in your company.
Once the players have been named and given the responsibility, technicians and, perhaps, outside vendors should be able to identify the training required to equip techs and managers to make the decisions that the data flow requires of them. If financial, engineering or other functions should be represented, bring them into the discussion.

The resulting plan should be a relatively inexpensive shift of responsibility with enough training to equip everyone to meet his or her new responsibilities.

This is also a good time to make one more change that will enhance equipment health and help everyone improve the readability of condition monitoring results. Establish a library of healthy equipment readings. Review and correct the alignment and balance of key rotating equipment, then file the resulting data for later comparison. Some assets can be done right away, as a project, and some must be done later following repairs or other installations. Do the same with new equipment prior to acceptance, allowing no poorly aligned or unbalanced machinery to be installed in the plant. Insist on a plant wide standard of precision alignment, lubrication, and torque management, starting with existing equipment.

As you build the library of baseline readings, use it as part of training to get technical and management people used to referring to baseline data. Add a plan for year-over-year tracking of production losses (and celebration of improvements), and the bridge-building process is ready to begin.

As time goes on and the team improves, some additional condition monitoring will undoubtedly be needed. This will generate the need for additional management training. There may also be some need for instrumentation and training for the technical people who do the readings. These costs should be easily offset by the production losses that will be prevented. And by now the business case will be clear to the experienced bridge-building organization.

Also on the subject of cost, the decision must be made as to what mix of in-house and outside project resources to use. Here is what Jason Tranter, managing director and founder of Mobius Institute (www.mobiusinstitute.com) has to say on the subject: “I personally believe that change is best driven from within rather than via consultants with their trademarked techniques. Too many companies have gone through multiple attempts at reliability improvement, whether it is lean, RCA, six sigma, TPM or some variant of RCM. As a result there may be a great deal of cynicism when another trademarked technique is introduced. A grassroots, teamwork-led, commonsense-driven approach to reliability improvement with realistic goals and buy-in from top to bottom cannot fail.”

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Mobius’ key advantage is its use of highly visual 3D animations and advanced simulation tools that make complex concepts easy to understand and remember. Mobius Institute Board of Certification is ISO 9001 certified and is an ISO/IEC 17024 accredited certification body that provides globally recognized certification to Category I-IV vibration analysts in accordance with ISO 18436-1 and 18436-2. More than 11,000 analysts from 129 countries have been trained since 2005. Mobius Institute has offices in Australia, the United States and Costa Rica, and Authorized Training Centers in more than 50 countries.

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