Written by Margaret Wilson, USC Consulting Group
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Overcome high labor turnover and aging equipment issues before they erode your capacity, efficiency and profits.

It's a disturbing thought, one that's keeping plenty of people awake at night. Our industries face two looming issues that will have an even greater impact on profitability and competitiveness than tough economic conditions: a drastically reduced skilled-labor pool and seriously aging equipment. Combined with higher costs for new capital purchases, this means that more restoration-type maintenance attention will be required from an ever-smaller qualified workforce. The manifestation of this problem is reduced availability and poor reliability.

Everyone understands that improving the availability of equipment translates into increased utilization and, ultimately, throughput. However, the long-term concern for most organizations (if it is not already, it should or will be) is their ability just to maintain availability at current levels. As most of us have unfortunately discovered, doing even that is becoming increasingly dicey.

To operate at current levels of availability, maintenance labor is key. Today, though, companies are not only having trouble finding and keeping skilled labor, when they do find it, it's not necessarily a one-for-one skill-set transfer. In other words, newly acquired skills do not match those lost to turnover and retirement. Further compounding the issue is the fact that managers are now adding more and more responsibilities to their own task lists as regulatory requirements increase and subsequent quality issues demand more oversight. This has resulted in a management capacity problem, wherein managers have less time to spend training new employees and bringing them up to speed. Despite this scary state of affairs, organizations have a number of ways to ease their labor pains.

Back to basics

To survive and be competitive, companies must improve on two basic dimensions of good business practice: standard operating procedures (SOPs) and data-driven decisions.

Capturing required practices...

There is only one best way to do anything. A good company recognizes this; a great company discovers "the best way," creates SOPs and requires absolute adherence to them in every facet of its operations. The benefit of standardizing work, as it relates to the issues discussed here, is that it allows new employees to have the same knowledge, standards and procedures former employees held. This means the organization has a better chance to get the one-for-one skill-set exchange it needs to maintain or improve its effectiveness. As long as replacement workforce members have the fundamental skills—essentially meaning they can read—*they can follow established procedures and step right into those experienced shoes*
. Standardizing work helps ensure consistent performance.

When developing maintenance standards, every organization must analyze the requirements from a work-content, labor and equipment perspective.

Performing labor analysis...

To get its asset-reliability program off the ground, an organization must first estimate its projected workforce losses over the next two to 10 years. This will help management make logical decisions about how to handle the skill drain and determine how quickly the organization needs to move to counteract short- and long-term negative impacts.

Next, perform a job task analysis and develop an accurate task-to-training matrix to determine the most critical, most frequent and most important tasks in the operations and the organization's ability to perform them. (Make sure the job task analysis is adequate. For example, a detailed review of the skills required to perform within a specific job description must be more detailed than "troubleshoot" or "work with 3 phase, 240 VAC.") Labor analyses will define what skill levels are required where and when, whether they are available in the existing labor pool or whether training must be implemented to develop the skill levels necessary to accomplish the jobs in question.

It is critical, when embarking on personnel acquisition, that this process include testing of new employees for the specific abilities, skills, attributes, mechanical aptitude and literacy required to perform a job to standard. Additionally, three other strategies should be implemented:

- Train operators to assume basic maintenance tasks to reduce pressure on maintenance personnel and improve labor efficiency.
- Perform Maintenance Task Analysis (MTA) on equipment using experienced maintenance and operations personnel (see next section).
- Leverage technology for decision support. Enabling tools should aggregate and prioritize data so that it becomes business "intelligence."

Performing equipment analysis...

A company can improve the effectiveness of its maintenance work by improving the type of activities performed. For example, it is better to monitor the actual health of equipment than try to prevent failure by replacing parts or the equipment itself on a time-based schedule. It also is crucial to leverage knowledge to ensure consistent and best practices across multiple locations with similar equipment. Use condition-based techniques to capture failures earlier and involve more employees in reliability and
asset management.

The first step in equipment analysis is to determine *asset criticality*. Use a ranking process for relative risk and impact to operations, safety and cost, should functional failure occur.

Once the equipment is ranked by priority, the next step is to complete a task analysis performed by a cross-functional team of maintenance, operations, quality and engineering personnel using RCM II[1] (for critical equipment) or MTAs. An experienced reliability practitioner should facilitate this analysis. The desired outcome is an understanding of the operational requirements, the potential means of failure, methods to sustain operation and corrective action once failure starts. It is important to note that any maintenance task analysis should include education and a solid understanding by the participants of the ways equipment can fail. Awareness of all failure curves, not just the traditional view that equipment fails due to age, promotes development of proactive, conditioned-based tasks and ensures that unnecessary work is not added to the workload or important tasks overlooked.

Once the equipment-maintenance task analysis is complete, it is documented in the form of SOPs. Said another way, it becomes the work or job plans loaded into the CMMS/EAM.

Two parts of the improvement plan are in effect: Schedule attainment for completing these tasks as planned can be tracked as a leading indicator and integrated into future planning; and

documentation is in place to ensure the program survives both planned and unplanned personnel turnover by maintaining the "how" and "what" of successful asset-management processes. These new procedures will require the enhancement/re-review of the skills matrix described above to ensure those skills necessary to support the added maintenance tasks are added and evaluated. Finally, to ensure the proper enabling tools are deployed, create a technology matrix to define what is needed to support the new/enhanced maintenance procedures, including:

- Non-destructive test equipment (vibration monitoring, oil analysis, infrared, etc.)
- CMMS/EAM enhancements
- Special tools and any associated training (torque, alignment, setup tools)
- Asset-performance management software

Enabling management

Implementing an asset-reliability program, of which SOPs and data-driven decision making are part, can ease labor and management shortages, improve equipment efficiencies and longevity, advance safety and improve production, product quality and customer service, as well as reinvigorate worker motivation.

Measuring maintenance...

The goal of applying a reliability-centered maintenance program is to improve the effectiveness of reliability programs, thereby improving the business' financial performance. When considering the cost per unit of output, the cost of maintenance can be broken down into three types:

1. **Base work**, defined as "the right work at the right time," is value-added. Also known as proactive work, it prevents failure, allows action to be taken to manage the consequences of failure or, once failure has occurred, deals with the failure effectively. By defining and performing the "right base work," we can reduce the amount of emergency work, lost production time, excessive parts consumption and secondary damage from failure.
2. **Non-value-added work** is work performed with negligible impact on the asset's performance, or work that is done too early, e.g., unnecessary/early rebuilds.
3. **Deviation work** is the reactive, firefighting work done when the undesired failure has already occurred and the action is too late to have any real impact. Extremely expensive, it's often mired with other unforeseen complications, failures and downtime.

Separating, prioritizing and managing the three types of work is best done under an

asset-performance management system instead of a traditional "maintenance as a cost center" concept. Condition-based methodology and data-driven decisions—*facilitated by technology*—help overburdened managers understand which are the critical few indicators and assets they should be looking at on a daily, weekly or monthly basis.

Establishing an asset-performance management system can help develop needed management skills and create supporting infrastructure so that the responsible parties are not literally waiting for the next failure to occur, which is exactly what happens under the traditional approach to maintenance.

Driving success...

Although responsibility for asset-performance management is shared by all levels in best-in-class organizations, administering a firm's assets—*human, financial and mechanical*—is a job for C-level management for the simple reason that these are the components that keep a company alive. This requires the kind of back-to-basics approach and strict adherence to SOPs and data-driven decisions that only an asset-performance management system can provide.

In conclusion

By establishing defined SOPs that capture and pass on knowledge, companies can reduce turnover due to dissatisfaction, mitigate the loss of skills associated with retiring personnel and hire literate resources that can meet the goal of maintaining or increasing asset-performance levels. SOPs provide a base of instruction that releases the management team from training and supervisory activities so it can focus on more critical issues. The management team better understands what work is required and the level of performance to expect, and gains access to the information required to make iterative, timely, fact-based decisions. The benefits are compelling:

- Less unplanned downtime and higher equipment availability
- Improved planned downtime activities and higher availability
- Improved quality, cost and OEE through increased equipment reliability
- A substantially stronger bottom line

Implementing an asset-performance management program before high labor turnover and aging equipment erode capacity, efficiency and profits can go a long way toward safeguarding a company's future. MT

Reference

1. For more information on failure curves, see RCM II, by John Moubray, or visit www.thealadonnetwork.com

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Margaret Wilson is a USCCG operations manager and its Asset Performance Management Practice leader. She earned a BS in civil engineering from the United States Military Academy at West Point and is currently on active duty in Iraq, in charge of maintaining operational readiness for a fleet of combat helicopters. USCCG (USC Consulting Group) is an independent operations management-consulting firm with over 40 years experience in the area of business performance improvement. Headquartered in Tampa, FL, the company also has offices in Chicago, Toronto and Milan, Italy.

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