

Maintenance Management 201: “More of the Basics”

By C. Bruce Hawkins, Emerson

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Introduction

This is a continuation of a discussion of fundamental “lessons” that new Maintenance Managers need to know in order to effectively manage an industrial maintenance operation in a proactive fashion. The first set was discussed in “Maintenance Management 101”, presented as an iPresentation on ReliabilityWeb.com and published in “Uptime” magazine in October, 2008. As with Maintenance Management 101, some readers may find this information to be elementary – but experience shows that few organizations have fully implemented the concepts.

1. You have the right to manage

Managers in many organizations feel “handcuffed” by bargaining unit agreements, past practices, traditions, and Human Resources policies in their attempts to manage personnel. They feel powerless to address poor performance on the part of employees for fear that any decision they make will be overturned. The lament “They won’t let me” is often heard.

This does not have to be the case. No union contract or HR rule will prevent you from setting clear expectations for all personnel within your department and following up to make sure those expectations are delivered. When people fall below expectations, the reason should be identified. (If the reason for failure to comply is due to the “system”, please refer to point 6.) If the reason is within the employee’s control, determine if it is a skill problem or a performance problem. If a skill problem, it is your job to provide the necessary training. If a performance problem, it should be documented with a clear explanation of the consequences of failure to comply in the future.

Another point is that authority is given on the basis of your position, but respect of the workforce, peers, and management must be earned. It is earned through fair and consistent treatment of individuals on your team. If employees lack the resources to meet expectations, it is up to you to provide them. If employees do not have the skills to do the job, it is up to you to provide training or reassign them to a position where they can be successful (more on this in point 2). You will lose respect if you fail to take action to address poor performance.

2. The right people will help you be successful

Management of people is clearly a different job than that of an individual contributor. Your performance is no longer solely due to your efforts; it is dependent on the performance of your subordinates. It follows, then, that your success depends on having capable individuals in every role on your team.

In the book *Good to Great*, Jim Collins describes one of the key attributes of great companies as having “the right people on the bus”. This attribute applies to smaller organizations as well. Some people are simply not capable of performing some tasks well because they do not have the innate talent to do so. As a manager, you will be tempted to devote a lot of time attempting to “correct” performance that is ultimately not correctable. When you do this, you are not helping the remainder of your team – you should be devoting your efforts to helping your good people produce at peak capacity.

Clearly, keeping someone in a position where they are a poor fit benefits no one. If you have an individual that continually produces substandard results, the other team members will spend their time compensating for the results of the poor performer. They will become frustrated and their performance will ultimately slip as well. Your organization will not produce superior results if you are continually compensating for someone who is not pulling their weight. The kindest thing to do in this case is to find a position – within the company or outside of it – where that substandard performer can excel. They will experience greater job satisfaction and your team will be more productive.

3. Field supervision of the craft workforce is critical

Maintenance work is different from most other jobs in that it constantly varies - craftspeople are doing a different task every day. One day they are rebuilding a pump, the next they are replacing piping, and aligning a compressor after that. It's rare to find a craftsperson that performs the same job day in and day out. Even with a good planning process, they still may encounter obstacles in the field that may cause delays, mistakes, or wasted effort. Crafts need the support of supervisors to make sure they have what they need to do quality work and to make sure any barriers to good performance are eliminated.

The most important job of supervision is to develop their team of human resources. They should identify skill development needs and create opportunities for their subordinates to practice new skills. First line supervision is also the point at which management decisions are turned into action. Supervisors need to enforce policies and procedures as well as ensure that standard work processes are followed.

Most supervisors are saddled with extraneous duties that keep them tied to their desks or attending meetings. If they are not allowed to spend adequate time in the field, they will not be able to provide the level of support needed to maximize the quality and quantity of work or to nurture the development in their people. The Maintenance Manager is responsible to make sure that the first line supervisors have at least 50% to 60% of their day devoted to field supervision of the craft resources.

4. You have to have procedures for performing maintenance

When one considers the wide variety of equipment encountered in the average industrial facility and the variety of tasks performed on that equipment, it is surprising to realize that, in most organizations, few procedures exist for maintenance and repair. Most organizations depend on “skill of the craft”, memory, or (even worse) an “educated guess” to determine the technical details required, such as clearances, torque values, tolerances, belt tensions, and the like.

Studies have shown that a high percentage of “infant mortality” failures occur in the absence of detailed written procedures¹. Equipment does not perform to standard or experiences a failure soon after startup. These can only be due to mistakes and errors made during maintenance or repair. These errors are not the craftsperson's fault; failing to provide the necessary resources to enable quality work to be done is the fault of management. Even the most talented craftsperson does not have an infallible memory!

Ideally, maintenance procedures should be developed by the Planning function. In creating these procedures, it is natural to want to avoid inserting too much detail to avoid “insulting” the craftsperson's intelligence. Rest assured that it is not an insult to make technical specification details available, nor is it an insult to spell out the proper steps to complete the job in the most expeditious fashion. In fact, the vast majority of crafts people would appreciate having the information available to do the job right the first time!¹

¹ http://www.reliabilityweb.com/art05/procedure_based_maintenance.pdf

5. Precision, precision, precision!

Reliability is inherently a function of design. All we can do from a Maintenance perspective is preserve that inherent reliability. All too often, significant potential equipment life is lost because crafts people did not pay the appropriate attention to detail in repair or installation. For example, studies conducted by Barringer and Associates² have found that if we have as much as 1/8” of piping misalignment in a standard ANSI end-suction centrifugal pump, we will lose as much as 45% of its inherent life!

To be an effective Maintenance Manager, you should insist that all work is done to the appropriate level of precision. Tools required to achieve this precision, such as dial indicators, calipers, torque wrenches, laser alignment devices, and the like should be available to all crafts persons. The tools should be included in the calibration program and each crafts person should be effectively trained in their use. Validation of precision work should be routinely performed through a post-maintenance testing program such as taking baseline vibration readings or operational performance tests. Regular audits of repair work should be conducted both to verify that the work is done correctly as well to illustrate the importance that you place on precision.

Another factor that bears mentioning along this line is to insist that crafts persons must be provided with sufficient time to achieve the level of precision required. There will always be significant pressure to complete a field repair quickly, but rushing through a repair is detrimental to precision. Considering the example above, if a standard pump has a Mean Time Between Failure (MTBF) of 7 years, and investment of 8 hours to correct a piping strain problem can potentially result in an added life of over 3 years. Remember the old adage. “There’s never enough time to do it right, but plenty of time to do it over”! Don’t rob your crafts people of their desire for quality workmanship.²

6. The system wins every time

The late Dr. W. Edwards Deming made the point that everyone works within a system. Most people want to do a good job. Often, they cannot do so due to constraints of the system. In point 5 above, if the “system” does not allow them time to use precision methods, we will not get a precise result. If our materials management “system” does not ensure we will have the materials required to do the work, we will experience delays. If our work management “system” does not include documenting work details after the job is done, we won’t have accurate equipment history. Good people performing in a poor system will produce poor results; average people performing in a good system will produce good results.

No organization can afford to be stagnant. There is always room for improvement, and it is a key responsibility of a leader to continuously drive improvements. Remember the saying, “If you do what you’ve always done, you’ll get what you’ve always gotten.” If we want to make improvements, we’ll have to change the system – but these changes usually cost money.

Since we operate within a larger financial “system”, we need to be proactive in obtaining funding for necessary improvements. One of the best ways to do this is to have a three to five year master plan that is updated on an annual basis. This will allow us to get our improvement ideas into the budget cycle, which will greatly increase the chance of funding. It will also increase senior management’s confidence in your ability to manage the department in a proactive fashion.

² <http://www.barringer1.com/oct97prb.htm>

7. Always question policies that don't seem to make sense

Although this may seem like an invitation to make a “career limiting move”, it is not – it is really an extension of point 6. Many “systems” that we work within do not exist by design; they have evolved over the years. The organization may have put a policy in place that was needed to address a problem many years ago, but the problem no longer exists. We sometimes find ourselves bound by those policies that needlessly stifle organizational growth.

A common example of this point is the decision to select some craftspeople for training in predictive maintenance technologies. A policy may be in place that such positions have to be awarded on the basis of seniority only, and when the position is bid, a craftsman who is only a year or two from retirement has bid on it and has the greatest seniority. Does it make sense to award the job to that person and provide a year's worth of training, only to have him/her retire just when he/she becomes competent?

The world around us is constantly changing, and sometimes our rules and policies need to change in order to keep pace. If we do not recognize this and make the necessary changes, it is tantamount to being “stupid on purpose”. We need to take an objective look at our rules, policies and practices, and modify those that don't make sense. Although this may be difficult to do in some organizational environments, you should still raise the issue. After all if you don't question an outdated policy, then who will?

8. Advanced tools will not provide full benefit unless the foundational processes are sound

Many organizations devote significant resources to implement the latest “three-letter acronym” tools before they are ready, and are surprised when they do not achieve the planned results. Reliability Centered Maintenance (RCM) cannot yield anticipated cost savings because the organization cannot implement the new tasks. Predictive maintenance (PdM) finds equipment problems in the early stage of degradation, but the workforce is consumed with “fix it now” emergent work and cannot make repairs before failure occurs. Autonomous maintenance, one of the pillars of Total Productive Maintenance (TPM), falls flat because the maintenance workforce is overloaded and cannot respond to the problems that operators detect. A “Just in Time” (JIT) parts ordering process cannot function until there is low demand for emergency parts and a good inventory control system is in place.

Much like building a house, the foundation must be completed before the walls go up or the building will not stand. Foundational elements for Maintenance include a complete set of “master data” and sound processes to control the work that gets done. Master data includes a complete list of all plant equipment that is ranked according to criticality and a thorough spare parts catalog of both stocked and non-stock spare parts. Work control processes include a well-conceived Work Order system (including effective Planning and Scheduling), a sound process for conducting basic maintenance (including a good lubrication program), and a fully functional inventory control system. These foundational elements will allow you to get control of both the work that has to be done and the condition of the equipment, enabling the advanced concepts to achieve their potential.

9. A good Predictive Maintenance program will allow you to sleep at night

The Maintenance Manager position can either be very frustrating or very rewarding. Frustrating in that breakdowns can occur at any time, and (in strict compliance with Murphy’s Law) invariably at night or on weekends when the equipment is needed most and when your family is depending on you to be with them and not at the plant. Rewarding in that there is a proven answer to those breakdowns if you have the foresight to implement a sound Predictive Maintenance program.

The key to maximizing your free time is to know the condition of your equipment. PdM technologies enable you to identify potential defects within equipment, usually while the equipment is still in operation. Often, some of these problems may be caught early enough that the condition can be corrected before the equipment suffers damage. With the right training, feedback, and experience, PdM technicians will also be able to give you a prognosis of the equipment’s remaining life which will allow you to take care of the problem on your terms and your schedule instead of at Mr. Murphy’s whim.

Not every potential failure is detectable, but the vast majority are with the right technologies employed – and new technologies are being developed every day. PdM is not “magic”; it’s hard science. The warning signals are real if we are perceptive enough to listen. Applying the right technology to the right equipment and potential failure mode will give you the ability to determine equipment health and increase your confidence that you can make plans with your family that won’t be interrupted.

10. Costs cannot be permanently reduced without making work go away

We live in a global economy. Most North American industries compete with companies in countries that have significant business advantages, such as lower taxes, lower labor costs, or government subsidies. There is tremendous pressure to cut costs to keep market share, and maintenance costs are typically a big target. In fact, it’s really easy to cut maintenance spending – just lay off maintenance crafts people and decide not to do routine maintenance. You’ll be a hero – for a little while. Sooner or later, neglect will come back to haunt you.

The only true way to permanently reduce maintenance costs is to permanently eliminate work. There are several ways to do this. Make sure the basics of cleaning, lubrication, and contamination control are in place. Implement a precision maintenance program to make equipment last longer (point 5). Use PdM to reduce the scope of repairs by correcting incipient problems before failure (point 9). Avoid unnecessary “open and inspect” intrusive maintenance that usually causes problems due to contamination and reassembly errors. Ensure that the craftspeople have sufficient skills and procedures (point 4) to do the job right the first time. Carefully assess all work requests from the field to determine if it truly adds value and should be done – otherwise, reject it.

Deferring maintenance spending is a short-term fix that has long-term implications. If you have not changed the “system” (see point 6) by any of the above techniques, expect the costs to rise six to twelve months in the future – and they will keep rising. Sustainable maintenance cost reduction is a result of doing the right things to make the work go away, not because of some misguided attempt to stop spending money.

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Emerson
Reliability Consulting
1100 Louis Henna Blvd
Round Rock, TX 78681 USA
☎ +1 888 889 9170

🌐 www.emerson.com/opcertcon

