



Simple Tips When Maintenance Issues are a Challenge

By Ricky Smith CMRP

Maintenance teams in a large number of plants face tough challenges every day. They come to work not knowing what they will face when they arrive because of equipment reliability issues. I found that by executing a few new ideas, they can make a major difference in the reliability and uptime of their equipment. My hope is that this article provides you with a few ideas to take the next step at your site.

"It Isn't What You Know That Will Kill You; It's What You Don't Know That Will."

There is an old saying, "You cannot eat an elephant all in one bite, but you can eat it one bite at a time." Let us begin by looking at some of the known problems that maintenance and reliability managers encounter on a daily basis:

1. Breakdowns are frequent - the causes are many.
2. Not enough maintenance is performed - cutbacks typically hit maintenance staff first.

Do these two problems drive you crazy? These problems, and many others, always drove me crazy when I was in maintenance management. Then I found a few steps that made all the difference between success and failure, which is not as drastic a difference as you may think. In fact, I have learned over the years that the difference between these two outcomes is exactly as shown in Figure 1.

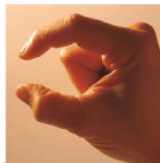


Figure 1: The distance between success and failure

Trust me, I have been where you are. As a former maintenance supervisor, I had to know the truth about where my program stood and develop a plan to overcome our primary obstacles, so that my crew could be successful. Those obstacles were:

- Performing preventive maintenance on equipment that continues to break down.
- Planner constantly chasing parts.
- Not enough staff to complete all of the daily work.
- Completing a repair just to see it again next week.
- Production blaming maintenance for equipment problems.

Based on all I have stated so far, I developed a few key questions to ask myself. This took a while; I am not a fast thinker or a quick learner. However, once I resolved these questions and overcame these problems, the reliability and maintainability of our assets went up. This immediately made my life, production's life, and my crew's life easier.

So, what are the four steps that, if followed, will make a large impact on the maintainability and reliability of your equipment?

Step #1: Upgrade the Reliability and Maintainability of Your Assets

After thinking about this concept, I knew there was only one thing a maintenance person would focus on: making the equipment maintainable, and thus reliable, to meet the intent of the end user-production. Listed below is the process I followed to achieve this goal:

1. Identify with production management-you want production to be a partner in this effort-what the most critical equipment in the worst condition is. Remember that it does not matter what we consider to be critical, but rather, what production management thinks is critical and can deliver immediate results if it were reliable.
2. Develop a plan with your crew and production to upgrade this equipment to a maintainable and reliable level.
3. Identify all the problems with this equipment using all techniques and technologies available at the time, including production data on the equipment.
4. Implement or ensure maintenance has a fully functional maintenance planning and scheduling role.
5. Execute your plan together with production and your crew, ensuring that all repairs are made using effective, repeatable procedures with specifications and standards. Perform a quality assurance/quality control check to validate that the work was completed to specifications. At this time of need, all egos must be checked at the door.
6. Once all of the work is complete, commission the equipment using as many predictive maintenance technologies as possible, along with production process data. Since a person cannot predict failure, condition-based monitoring is a much more accurate representation of what is truly being performed.
7. Post a sign on the equipment that states: "WARNING: Maintained equipment in this area" (see Figure 2 - warning sign). Establish an agreement between your crew and production to maintain this equipment to "like new" conditions no matter what. The results will shock you, so record the production output increase once the equipment is up and running.



Figure 2: Warning sign example

8. Since people's memories are very short, post the results that you achieve by the equipment, and make sure that they are updated daily by your production partner. One of the best items to display is mean time between failure (MTBF) of specific "best actor" assets. Put this by the equipment on a weekly basis, as shown in Figure 3.

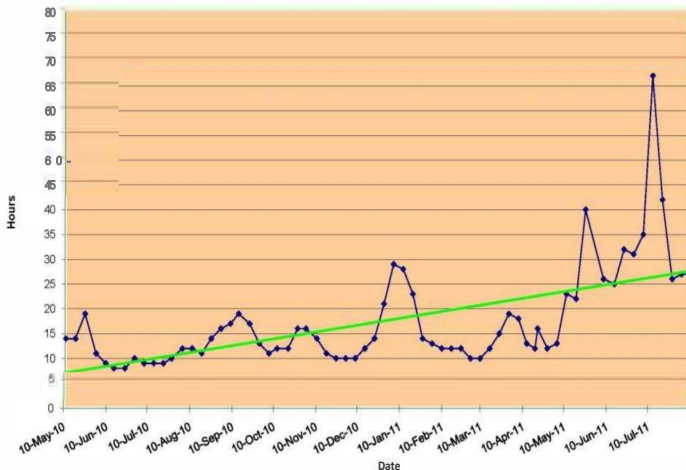


Figure 3: Mean time between failure (MTBF) example - 900 electric motors (compliments of Kim Hunt - Domtar)

9. Develop an effective Failure Modes Driven Strategy for the equipment-identifying failure modes, causes of failures, etc. to build a solid maintenance plan using preventive maintenance, predictive, and condition-based monitoring.
10. Move to the next piece of equipment based on production management's input, and complete the steps the same way you did for the last one.

If you follow this same process, you will be successful in improving your assets' reliability and maintainability while meeting the requirements of production.

Step# 2: Identify Where You Are and Where You Are Going by Using Simple Metrics That Measure EFFECTIVENESS.

Having the right effectiveness metrics in place and focused on continuous improvement is the answer. A great example would be if preventive maintenance (PM) compliance is above 98%, but the equipment continues to fail. It does not make sense, right? Well, have you ever thought about using a line graph that shows the correlation between PM labor hours and emergency labor hours in order to measure PM effectiveness? You must know where you are before you can begin a journey. See Figure 4, and if the results are not acceptable, you may want to review Step #1 again. PM compliance is a metric that only measures if PMs are completed on time. It is a joke in many organizations.

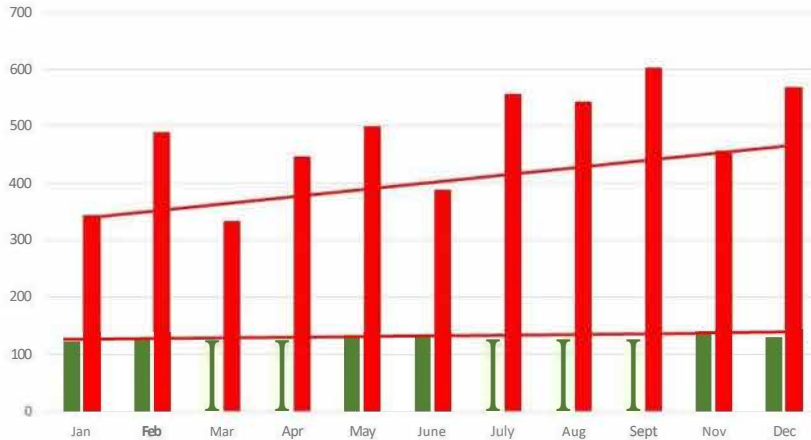


Figure 4: PM vs. emergency labor hours

With this one metric, you will know where you are with your current PM program. Once you know where you are, you can begin to develop a plan to head in the right direction.

Step #3: Use Maintenance Dashboards to Manage an Area or Function

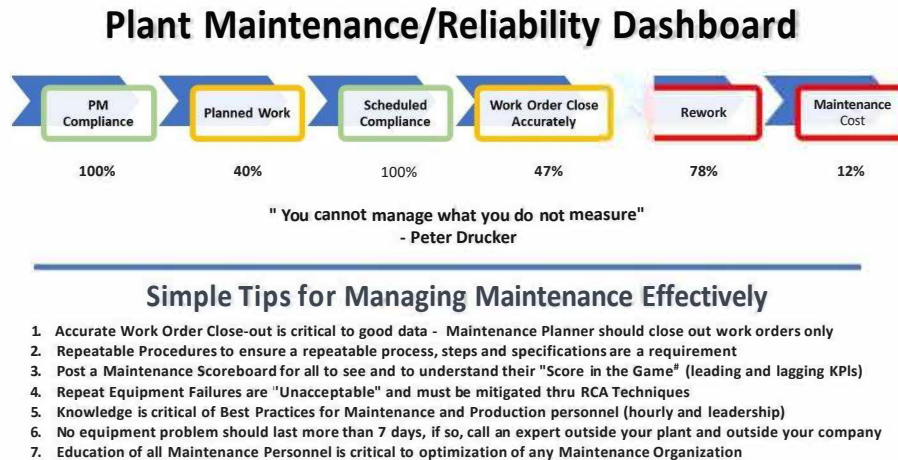


Figure 5: Maintenance dashboard example

The next step is to develop a maintenance dashboard that has a live comparison of specific KPIs which validate each other. This is like driving down the road in your car and looking at all the gauges; if one is flashing red, you may need to stop and solve the problem. The KPI dashboard concept is the same. This specific one can be fed by an Excel program, which is populated by your CMMS/EAM or other data source.

To build the dashboard, begin by identifying three questions that you would like to know the answer to on a weekly or monthly basis, which would confirm or deny all KPIs are accurate.

Question 1: Are work orders closed out accurately? (Planner closes work order.)

Question 2: Is the data accurate? (Review data accuracy monthly.)

Question 3: Are my metrics improving because our actions are effective?

Step #4: Create and Manage the Plant with a "Plant Scoreboard"

Post the plant scoreboard on video monitors or charts in the plant, in all production areas and in the maintenance shop.



Figure 6: Plant scoreboard example

Definitions

Without a definition, you just have someone's opinion.

Wrench Time: "Hands-on tool time" or the time your people are actually "turning wrenches" or performing proactive work. Also is one indicator of whether your planning and scheduling functions are meeting requirements.

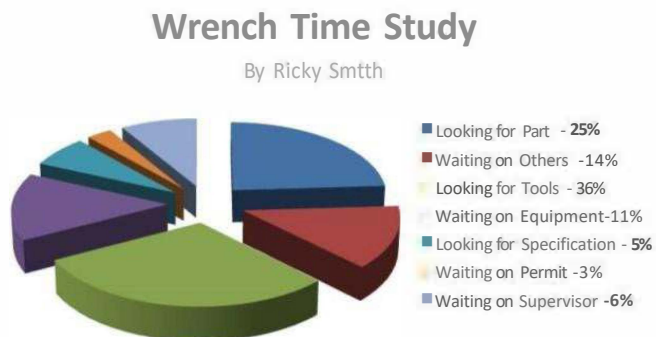


Figure 7: Results from author's wrench time study

World-class wrench time is 55%-65%. **Note:** If your wrench time is 25%, and you improve it to 50%, you just increased the amount of proactive work being conducted by 100%. A workforce of ten maintenance people at 25% wrench time that moves to 50% wrench time is now completing twice as much effective maintenance work with the same number of technicians.

Preventive Maintenance: Actions performed on a time- or machine-run-based schedule that detect, preclude, or mitigate degradation of a component or system, with the aim of sustaining or extending its useful life through controlling degradation to an acceptable level.

Planned Work: The percent of work orders which have all the defined fills filled in. A planned job, at the minimum, should have:

- Repeatable, effective work procedures
- Equipment specifications and standards
- Required parts and potential parts
- Coordination required and with whom and when
- Warnings and cautions
- Craft and estimated labor hours
- Actual prep and execution time

Planned work objective: A repeatable/effective PM, repair, rebuild, lubrication, etc.

Scheduled Compliance: The scheduling of maintenance labor in coordination with operations, contractors, engineering, and safety personnel to minimize interruption to operations and production. Also, to ensure the work is completed on time, effectively, and is measured by day and by hour. Scheduled compliance is measured by dividing the total labor hours available (all maintenance labor hours with the exception of people who are on vacation or sick leave) into the total labor hours completed by day and by week. I know people like to move the work because of issues from day to day. That is acceptable however you do not receive compliance for it. The items which are taken away from scheduled compliance will be identified in a Wrench Time Study.

Conclusion

If you want to succeed, take things one step at a time as I stated in my article and stay FOCUSED. People love to be successful, and these ideas allow a maintenance crew to be successful. I am telling you these things having been in maintenance management myself; I have seen many companies succeed around the world following these recommendations. I would like to add you to the list.

Do not strive to be "world-class," strive to be the best you can be.

Join me for "Maintenance Excellence for Maintenance Supervisors" LIVE in Asheville, NC

Questions? rsmith@worldclassmaintenance.org

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