

MAINTENANCE AND RELIABILITY



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Introduction

Maintenance has existed for as long as people have had important possessions. You won't throw away an expensive piece of equipment if it breaks down; instead, you'll repair it. Are Maintenance and Reliability same thing? Although they're both based on the same activities, it's easier to think of the latter as a progression of the former.

Maintenance has historically been a one-on-one professional partnership with machinery, with something being patched when it fails. On the other hand, reliability culture includes all that machinery communicates with, including technology, culture, architecture, and maintenance strategy. It aspires to a more systemic approach that explores the underlying causes of failures and develops long-term solutions to mitigate them. In other words, those in charge of maintaining and expanding the useful life of properties are moving away from a reactive mentality and toward a constructive one.

It's been a transition since the industrial industry started to adopt digitalization. We're in the midst of Industry 4.0, a fourth industrial revolution that has enabled the Internet of Things to link devices and use data to better plan and understand maintenance operations. With that shift in place, the concept of dependability has gained a lot of traction.



What is reliability culture?

What does reliability culture mean if reliability relates to the practices put in place to proactively prolong the useful life of an asset? Reliability culture, according to Bruce Wesner, a former Managing Principal of Life Cycle Engineering, boils down to assigning asset ownership. Operators should behave as asset owners because they are the ones that deal with machinery on a daily basis.

TPM: A strategy steeped in Reliability

This is where a total productive maintenance (TPM) approach comes in handy. To reiterate, TPM believes that everyone in a facility should be responsible for maintaining it. A 5S base, according to this strategy, will help implement the processes and standardization required for operators to begin thinking about machinery as something that needs to be measured, tested, and cared for on a regular basis.

Management will begin to instill a true TPM structure by setting up activities that support the eight pillars of TPM once operators have completed the activities required to lay the groundwork for TPM. Larger programs, such as introducing a CMMS, formalizing a TPM mission and vision, and conducting reliability audits, can help keep reliability top of mind for everyone.

Setting up a reliability-focused culture would only become simpler as Industry 4.0 gains traction. Facilities will be able to step into a fully predictive maintenance mode, where reactive "maintenance" is left in the past and scheduled, constructive, reliability-focused work is the standard, thanks to the information generated by connected machines and smart data.



Importance of Maintenance and Reliability

In any well-functioning development, maintenance and reliability management are critical. They assist in providing adequate maintenance on the appropriate properties at the appropriate time. It decreases computer downtime and has a direct impact on the organization's performance and long-term viability. It enables businesses to make the best use of their capital while still ensuring optimum productivity and security in the workplace. They are important in the following manner:

- Improving production quality and quantity
- Reducing production cost
- Improving employee satisfaction
- Improving Equipment longevity
- Better scheduling



Maintenance and its Types

And now, we will show the advantages and disadvantages of the different types of maintenance:

Corrective Maintenance

Advantages:

- Low cost
- Less employees needed

Contrary to popular belief, there are a number of disadvantages to using this method.

- Costs rise as a result of unplanned equipment breakdowns
- Additional costs due to equipment repair or replacement
- Increased labor costs, particularly when extra time is required
- When primary equipment fails, secondary equipment can be harmed.
- Ineffective use of human capital

Preventive Maintenance

Advantages:

- Inactivity time is reduced, resulting in increased equipment availability
- Maintenance regularity allows for greater flexibility
- Component life cycles are extended
- Energy savings are realized; Failure rates are reduced;
- Costs are reduced by 12-18% as compared to corrective maintenance.

Disadvantages:

- Intensive workforce
- It requires activities that may or may not be truly necessary but are recommended
- These activities that may or may not be truly necessary may inadvertently cause harm to other components

Predictive Maintenance

Advantages:

- Component availability and lifespan rises
- Equipment inactivity period decreases
- Materials and labor costs decrease
- Employee morale improves
- Cost savings between 8-12 percent compared to preventive maintenance

Disadvantages

- Significant initial expenditure in diagnosis equipment
- Increased investment in staff training
- Potential savings are not easily interpreted by the customer
- Long-term savings are only viewed as meaningful



Conclusion

One of the most important aspects of running an organization, no matter what sector you are in, is ensuring that every part runs as smoothly as possible. Setting up the right reliability and maintenance program would help ensure that all of the organization's facilities are operating at peak performance. It is obvious that providing a well-organized and reliable maintenance and reliability management system is beneficial to an organization's success.