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Reliability is worth a second look

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Statistical analysis and time-based preventive maintenance don't really address the ability to perform. It's time to get familiar with the definition of reliability.

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The word "reliability" unnecessarily intimidates many maintenance professionals. In my opinion, most people associate reliability with reliability centered maintenance (RCM) and they're unclear about what it actually means. The definition is simple: Reliability is the ability of an item to perform a required function under a stated set of conditions for a specific time period.

This definition isn't at all intimidating, but having worked with more than 400 maintenance organizations, I found that most still focus on fixing failed equipment, not on ensuring reliability and avoiding failure.

A common reason is there's no time available to investigate the true requirements that ensure equipment reliability. Yet, there's a growing awareness among reactive maintenance organizations of the consequences of poor equipment performance:

- Higher maintenance costs
- More failures
- Downtime, safety and environmental issues

It's time for reactive maintenance organizations to admit there's no silver bullet to the equipment performance problem. Lean manufacturing and world class manufacturing don't directly address optimal asset reliability. Forget the silver bullet and focus on asset reliability. The results will follow.

The steel company Dofasco needed a corporate fact-finding mission to change its focus to asset reliability. A team of more than 60 key employees spent more than two years researching the world's best maintenance organizations. They found that a focus on reliability gave the biggest return with the longest lasting results. Today, Dofasco Steel is a top-notch North American steel producer, and the company won many awards for its reliability-focused maintenance.

Companies like Dofasco that understand reliability typically have the best performing plants. A reliability-focused organization takes a holistic approach to asset management, focusing on people and culture. Common characteristics include:

- The goal is optimal asset health at an optimal cost
- A focus on processes — what people do to achieve results
- They measure each process step for effectiveness, not just results
- PM programs focus mainly on monitoring and managing asset health
- PM programs are technically sound, with each task linked to a specific failure mode — formal practices and tools identify the work required to ensure reliability

Don't focus your entire maintenance effort on a PM program that has little to do with meeting the actual equipment reliability needs. Statistical analysis techniques such as Weibull only help to identify assets for which reliability is a problem. You don't need engineering resources to figure out that your MTBF is too small. Besides, it's easy to identify bad actors. Rather than measuring failure frequency, figure out how to improve reliability.

Use statistical analysis to set frequencies for time-based PMs, which should account for a very small portion of your PMs. Here are some sobering facts that will make you think twice about the effectiveness of a time-based PM program:

Less than 20% of asset failures are age related, so how does one identify the PM frequency? My findings indicate that 98% of companies don't have good failure history data.

Most reliability studies say that 80% of asset failures are random. You can detect early signs of random failure by monitoring the right health indicators to determine whether the asset is degrading. The P-F interval is the time between the detection of a potential failure (P) and functional failure (F). A maintenance organization needs to know the PF curve for critical equipment. This approach allows time for corrective action, in a scheduled and proactive manner, before functional failure occurs.

Take a step back and review the way you manage equipment performance. If equipment continues to fail after preventive maintenance or overhauls, then something must change. Focus on ensuring plant asset reliability. Everyone in a plant should understand the definition of reliability and what it means to the success of the company. Make reliability your plant's collective buzzword.

If you want a poster showing the PF curve, send me an e-mail and I'll gladly send you one.

You can contact Contributing Editor Ricky Smith, CMRP, at ricky-smith@comcast.net.



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