

SOLUTION BRIEF

Asset reliability drives value while reducing risk

Introduction

In this brief, we will dive deeper into asset reliability and explore how to identify the most critical assets and the necessary data they generate. Once that is accomplished, organizations can monitor and analyze these assets to predict failures before they affect business-critical operations.

Asset reliability—a real source of latent value

A successful automated asset reliability program starts by using proven methodologies to identify the critical assets, determine their essential data points and parameters, and calculate the right amount and frequency of data to collect. Then you can define possible actions to take in response to the variety of interpretations of the data.



As digital methods and automation become more commonplace, maintenance professionals will need to rely on their maintenance system more and more in order to fully leverage this large and growing data set.

Identifying critical assets

An effective asset reliability program builds a foundation of maintenance organization data. But not all equipment, and the unique data generated from that equipment, needs to be connected, monitored, and analyzed. The cost to monitor all equipment and all variables would be far too high, and the value never realized. The total cost of ownership for such an endeavor would include installing and tuning sensors, developing the required network connectivity, determining the data strategy and storage needs, creating the analysis methods to make sense of the data, and the sheer maintenance of this ecosystem. This partial list of activities can represent an excessive investment.

To avoid all that, focus on your most critical assets. This can be accomplished by performing a thorough review of all equipment. This initial review will help you select the “right” assets for your maintenance strategy, possibly by leveraging a well-established, reliability-centered maintenance (RCM) program. This is the starting point for the identification triage.

Additionally, you’ll want input from a diverse team that ideally consists of individuals from a variety of functions, including process controls or instrumentation, mechanical and reliability engineers, operations and maintenance personnel, and OEMs. By including the right mix of expertise, the team will identify the most critical equipment based on your organization’s predefined business and HSE criteria. This review will yield the equipment listing and components at the highest risk of failure, which will then provide the most value by being systematically connected, monitored, and analyzed. This review should be completed periodically so that additional equipment can be included and new conditions considered in the evaluation.



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The most relevant data

Once the critical assets and their components are identified, the next step is to focus on data capture. Over the last few decades, machinery complexity has grown, with more types and more specialization. Pumps and compressors must operate within tolerable vibration to achieve throughput. Fundamental to this is the reliance on condition monitoring: a maintenance approach that assesses machinery performance to deliver expected outcomes.

Data is—or should be—the valuable feedstock that drives any useful analysis. For equipment that moves or measures, the key variables can be pressure, throughput volume or rate, vibration, temperature, and the like. Sensors today are measuring these variables and producing data many times per second. These sensing devices can be hardwired into field automation or connected to field wireless networks, creating an Internet of Things. Methodologies, such as RCM, help guide device installation, defining components, the physical variables, and the precision and frequency these measurements are collected.

Over the last ten years, access to data has dramatically improved. With the cheaper and greater access to data, deeply rooted data numbness or skepticism has also set in. Many engineers or control room operators (CROs) routinely question the data streaming towards them, as the automation equipment can be unreliable or unmaintained. But overwhelmingly, those concerns about the data are unfounded, as most of the data becomes more accurate with time (assuming calibration schedules and properly maintained equipment).



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With so much data available, leveraging it becomes the next challenge. There are hundreds of analysis tools that help make sense of this data deluge. Some are designed for a specific purpose; others have broader functionality. These tools can create basic user notifications, such as when a threshold value has been breached. They provide CROs real-time assistance as they monitor hundreds of pieces of equipment and dozens of processes.

Yet, this business-rules approach has its limitations; subtle, hidden patterns in the data usually go undetected. Next-generation technology, such as artificial intelligence (AI), provides a significantly improved approach to evaluate this data because AI can identify previously hidden correlations in the variables. Now, we can see data trends that were previously unseen—and gain meaningful insights. For example, Multivariate State Estimation Technique (MSET) is one of the most proven, powerful analysis techniques for finding the subtle anomalies, and it is hardwired into many Oracle Analytics Cloud products.

One of the most useful aspects of AI and the related machine learning—apart from identifying curious anomalies—is the ability to predict equipment failure long before any real impacts are manifested. The goal of these analytics tools is to avoid failure, and the high costs and risks associated with unplanned equipment and process disruption.



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Harness the power of data for improved maintenance

Using the newer analytics tools has never been easier as they are built with users in mind. These tools offer a seamless user experience that provides all the required functionality while integrating other data sources. Now, master data can move into the monitoring apps using the exact equipment data. Analysis recommendations and work order creations are only a step away, with just the touch of a button.

While the benefits of a data-driven maintenance strategy are clear, it can be challenging for many companies to embrace these technologies. Siloed systems create barriers to generating insights. Human bias in analysis can influence outcomes. Yet organizations that have been able to leverage their data for predictive equipment maintenance report significant reductions in unplanned downtime and increased equipment reliability. If you're ready to begin, start with an honest assessment of your current state, coupled with a bold view of what's possible.

Oracle can help with integrated asset lifecycle management software that leverages AI and machine learning

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