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How Schneider Electric Improves Equipment Reliability and Reduces Costly Unplanned Outages

Roland Jones | Dec 31, 2020

Operational costs are typically a significant drain on your company's resources. Here's how Schneider Electric uses predictive maintenance technology to improve equipment reliability and reduce corrective maintenance costs.

Running a large medical facility is a big enough challenge without having to worry about how each electrical component is faring.

Mark Schwartz, director of facility operations at the University of Rochester Medical Center in Rochester, New York, ***runs just such a facility*** that cares for approximately 140,000 inpatients and over a million outpatients each year.

"Given the scale of the medical center and the age of the different components, we have a tremendous job trying to keep it all operating on tight budgets," he says.

To provide medicine at the highest level, the medical center needs its buildings to also perform at the highest level, Schwartz notes. Predictive maintenance technology allows Schwartz and his team to identify which equipment they need to upgrade, retrofit or replace prior to its actual failure: It's about taking building equipment and "giving it life, giving it intelligence," he says.

> **"Different approaches to equipment maintenance have varying effects on such things as facility safety, service continuity, optimization of the power infrastructure, equipment protection, energy efficiency, efficient spare parts management and the total cost of asset ownership."**

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Predicting Problems

The use of data is transforming society, business and the economy. In manufacturing, for example, the

potential improvements to building and machinery maintenance costs from data-driven maintenance techniques, including predictive maintenance, are significant.

Want Efficiency? Be Smart About Your Spare Parts

Every year, companies face significant losses due to unexpected downtime. Unexpected power outages ***cost U.S. businesses over $27 billion annually***, according to E Source Market Research.

To maximize a company's uptime and electrical distribution system's performance—or in the event of a failure, restore the system as quickly as possible—Schneider recommends that companies proactively purchase spare parts to have them on-site if needed.

To do this efficiently, it pays to develop a plan that may include:

- Identifying critical components
- Evaluating the type, age, usage and operating environment of your equipment, and making notes about its current condition
- Accounting for accessibility and maintainability
- Analyzing reliability part lead times, MTBF and MTTR ("mean time between failure" and "mean time to repair")
- Creating a recurring maintenance strategy

For new projects, it's important to invest time and energy proactively to create an efficient stocking strategy, says Dakota Blair, services transactional program manager at Schneider. For existing equipment, do an assessment and build a plan to have critical parts on hand.

"How long will the part take to be manufactured if needed for replacement? Or can we design the project to leverage the same part that can be applied to multiple critical power loads?" he says. "That way you can stock one part instead of multiple [parts]."

Data collection and analysis uses machine learning, pattern matching and other data-driven technologies to make predictions, identify patterns and generate recommendations based on insights found in data.

According to ***a report by Deloitte***, organizations that harness the power of advanced data analytics can increase productivity, reduce breakdowns and lower overall maintenance costs.

This is certainly true for electrical distribution equipment maintenance. Different approaches to equipment maintenance have varying effects on such things as facility safety, service continuity, optimization of the power infrastructure, equipment protection, energy efficiency, efficient spare parts management and the total cost of asset ownership.

Harnessing Your Data

In the past, corrective maintenance and preventive maintenance approaches have been popular among maintenance managers. Corrective maintenance restores assets after unplanned downtime (basically, when a machine breaks down). The process involves troubleshooting, disassembling and repairing the machine, and it results in periods of costly downtime.

Preventive maintenance, on the other hand, involves carrying out maintenance at predetermined intervals, or according to prescribed criteria, and is intended to reduce the probability of machine failure or the degradation of the functioning of an item and therefore costly immediate corrective intervention.

Both these approaches have their own advantages and disadvantages (for example, a corrective maintenance approach may be perfectly acceptable for a noncritical asset). But for companies that want to avoid downtime for critical machinery, predictive maintenance is an approach that can reduce costs further through the evaluation of process and machine data. It can foresee when critical operational equipment may fail and initiate strategies to mitigate that failure.

Digital technologies used for predictive maintenance may include:

- **Sensors** on equipment that allow for remote, continuous condition monitoring and data collection.
- **Edge computing** at the equipment level that facilitates user interaction through software interfaces.
- **Cloud-based platforms** where advanced analytics can merge and correlate data from a variety of sources.
- **Big data analytics** services with smart algorithms that can emulate equipment behavior and predict when it may fail.

Take, for example, a manufacturing company that wants to lower its costs. To do so, it could implement digital technologies (remote monitoring through a cloud-based platform, for example) to gather and analyze data from equipment sensors worldwide.

Using this data, these specialists can define critical thresholds for each of their machines and work closely with on-site technicians to resolve problems before they occur, reducing the cost of unplanned downtime and avoiding the cost of dispatching specialists to examine equipment on-site.

For Schneider, this means not only installing electrical systems but also monitoring and optimizing those systems, says Dakota Blair, services transactional program manager at Schneider.

“We can monitor your power quality, or temperature sensors inside your equipment can tell us if an imbalance could lead to a shutdown because the breaker would trip,” he says. “We can actually sense that before it happens, and we have a team that will call that factory in Wisconsin to warn them about it.”

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Benefits to Customers

The efficient maintenance of electrical distribution equipment has five important benefits to companies:

- **Improves safety:** Anticipating and correcting for possible equipment failures helps companies minimize the risk of unwanted events, such as those that harm personnel, assets or the business, while following international standards for environment, health and safety.
- **Maximizes uptime:** It takes less time to perform proactive maintenance than emergency repairs, but predicting when machine failures will happen and correcting them is even more efficient,

mitigating its impact on operations with less disruption to activities. The consequences of even an hourlong production shutdown can be enormous.

- **Optimizes your assets:** New equipment is costly, so managers want their electrical distribution equipment to run safely for longer with maximum availability. Stress accelerates equipment wear, shortening its endurance. Using technology to improve its endurance can reduce stress and prolong the life of the equipment.
- **Improves cost-efficiency:** When companies suffer from sudden machine failures, they often must purchase spare parts and labor in a hurry (and at a premium), and they suffer due to the costs of unscheduled shutdowns. Eliminating these events improves operating costs, as does ensuring your equipment is as efficient as possible, and therefore as energy-efficient as possible.
- **Creates competitive advantage:** Modern and up-to-date maintenance practices have become a vital competitive advantage thanks to their use in early detection by identifying problems before they require a major repair. Knowing when scheduled outages will occur also allows managers to staff accordingly. It delivers a unique opportunity to achieve more rigorous cost controls.

Drive Toward Advanced Analytics

Established in the 19th century, Schneider began operations in the steel and machine industries and soon entered the electricity and construction markets. Now the company focuses on the electricity market, energy management and innovative technologies.

Schneider *works with organizations such as the University of Rochester Medical Center* to help them ensure power infrastructure reliability, which for a medical center is critical.

Even though emergency power generators are in place, the core electrical systems have to be reliable, Schwartz says: "When power goes out at this institution, even though we have emergency backup, it still makes people very nervous," he says.

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The use of advanced analytics continues to evolve, providing companies with the tools they need to improve facilities management. Technologies such as predictive maintenance allow companies to reduce downtime and improve workplace safety. The data collected and its analysis can be used to gain deeper insights on building use and needs, and help companies react before a mechanical issue becomes acute and costly.

As the use of advanced analytics becomes more accessible and the cost of implementation falls, more companies are likely to adopt the technology and it is likely to be applied more broadly across industries.

How have you harnessed data to drive efficiencies in your facility? Share your thoughts in the comments below.

