



# Digitizing the Electrical Infrastructure

By Emanuel Kourounis

**T**ime, cost, and productivity are top of mind for any leader who is looking to run an efficient business, and it is important to look at these through the perspective of a facilities manager. Facilities are running on aging electrical infrastructures that may result in delayed production due to equipment malfunction, or costly safety hazards. To keep their facilities up to date with the most current technologies, facilities managers may want to consider implementing data-based asset performance management systems (APMS) to ensure that their systems are as safe, reliable, and efficient as possible. An APMS can help provide valuable insights to managers and help them make better business decisions. But before initiating it, managers should approach these changes with a

solid strategy in place that can be implemented over a period of time. If an APMS is part of your vision, then every modernization, replacement, or new project should be part of that long-term strategy.

## PLANNING FOR INTEGRATION

There are many factors involved in developing a long-term strategy for a complex electrical distribution system. But if the goal is to be more proactive by leveraging digital technology, facilities managers should first consider implementing communications technology. Another consideration is data quality. Managers need to have a clear understanding of what type of data the assets can provide and how that data aligns with the system. With the understanding that all algorithms, thresholds, rules, and computations

require a certain amount of data to deliver the desired outcome, the strategy must deliver the necessary data points to the system. Remember, the quality of the data will determine the level of predictability that a system can deliver. Developing a long-term, multiphase strategy to predict system reliability will help absorb the replacement cost and modernization over time and minimize the impact on the process.

Prior to finalizing the strategy, it is important to sit down with equipment vendors to discuss the most appropriate way to bring their systems up to speed with current technologies. In addition, the facilities managers must ensure the technology they are planning to incorporate includes:

- **Excellent network communication:** The vendor and customer teams will need to ensure they are adding the most intelligent connection capabilities possible, and that they deliver high-quality, consistent communications across the whole system.
- **Superior data quality:** Facilities managers should ensure that the data being communicated throughout the system is accurate and in alignment with the APMS requirements.
- **Leveraging existing systems:** Most facilities have existing systems that are currently collecting data. To reduce implementation costs, consideration should be given to leverage existing systems and share the data between platforms.
- **Cybersecurity:** With a digital system, it goes without saying that security for sensitive information should always be paramount.
- **Interpretation of the data:** Have a clear understanding of the capabilities of the software system. How is the data being analyzed? Who will be interpreting the data and acting on it? What data is required to analyze the performance of the assets the facility wants to monitor?

#### PRIORITIZING YOUR STRATEGY

As you finalize the strategy, you need to prioritize your plan.

**Foundation:** Building the foundation is the most important step. Start by identifying your most critical assets. Trans-

formers and medium voltage (MV) circuit breakers should be at the top of your list. Facilities managers must also make certain that the new equipment will have the appropriate options to be in alignment with your APMS.

**Networks:** Ensure all substations that will be monitored have access to your network. Ethernet drops will be required at every substation.

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**Edge Control:** To minimize the connections to the cloud, edge control should be considered. Edge control could include platforms such as energy management systems, building automation systems, and supervisory control and data acquisition (SCADA) systems. These platforms will allow for data to be aggregated in one location and thus minimize the number of connections to the cloud.

**Apps and Analytics:** The apps and analytics need to be able to evaluate data correctly and deliver actionable insights. The APMS should have the ability to receive data from the field and apply asset-specific algorithms, thresholds, rules, and computations to determine operating conditions.

**Deliverables:** As the workforce retires, facilities managers are challenged by scarce resources.

Most facilities do not have the resources to sit in front of a screen for a long time, and if they do, they often do not have the skillsets needed to interpret the data they are looking at. The APMS should deliver workable insights, such as documentation that includes the data itself, interpretations, actions to be taken, a timeline to accomplish those actions, and recommendations on maintenance cycles.

#### THE FUTURE OF ASSET PERFORMANCE MANAGEMENT

Incorporating an APMS will transform the way facilities managers and staff perform their work and will also improve their electrical system's performance and reliability. Managers will have a clear view of how systems are performing through continuous monitoring, and will be provided with the information they need to make better business decisions; thus they will be able to take a more proactive approach to maintaining their electrical distribution systems.

Additionally, these performance management systems will give facilities the resources they need to operate more effectively. Facilities have typically struggled with having adequate resources, whether it be the time necessary to perform tasks, or onsite staff who can interpret the data they have acquired. The APMS will feed back the information to an experienced professional who will be able to interpret it accurately and devise a plan to help onsite staff improve their system's functionality.

Facilities staff can also expect safer working conditions because they will have a more concrete idea of how their equipment is operating. Of particular concern is the fact that they are currently expected to monitor some electrical equipment while it is energized—but a performance management system with the appropriate sensors can mitigate risk by feeding back information without placing staff in potentially dangerous circumstances.

#### CONCLUSION

Both facilities managers and staff will notice increased operational efficiency, safer conditions, and lowered costs associated with system performance maintenance once they have integrated an APMS. And though this technology is still in its infancy, its potential to improve a facility's electrical infrastructure can help them take a decisive step into our digital world. ☎

Emanuel Kourounis is business development manager at Schneider Electric in Debary, FL. He can be reached at [manny.kourounis@schneider-electric.com](mailto:manny.kourounis@schneider-electric.com). This is his first article for *Facilities Manager*.



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