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WHITE PAPER / **OUTAGE MANAGEMENT**

MANAGE OUTAGES BY HARNESSING THE POWER OF TECHNOLOGY AND PROJECT MANAGEMENT

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Every day, our electrical infrastructure is threatened by age, weather and malicious attacks. Utilities can fight back against this persistent pressure with a proactive and coordinated approach that capitalizes on existing technology to streamline outage management.

The U.S. power grid is one of the largest and most extraordinary machines in the world, but it's at considerable and ever-increasing risk. Much of the electrical infrastructure has already outlasted its life span by 25 years or more. Our grid is vulnerable even in the best of conditions — and we're far from those best conditions.

Though investment in the electric grid has increased over the past decade, the gap between the investment and need continues to widen. According to the American Society of Civil Engineers' Failure to Act Report from 2016, funding gaps in electric generation, transmission and distribution are projected to accumulate to $177 billion by 2025.

Increasingly, extreme weather events are impacting the energy system. Including hurricanes along the East Coast and Gulf Coast, extreme precipitation events in the Northeast and Midwest, heightened wildfire conditions on the West Coast, and temperature swings nationwide, catastrophic weather events are causing more frequent and longer outages.

Cyberattacks on the power grid are another growing risk. While utilities have, for the most part, kept the danger at bay, the threats to the system increase daily. In fact, a recent assessment from the U.S. Government Accountability Office emphasized the increased vulnerability of the grid to cyberattacks.

HOW INCREASED OUTAGES ARE CHALLENGING UTILITIES

Outages play a key role in the safe and reliable operation of the electric grid. Planned outages help facilitate replacement or upgrades of existing equipment such as conductors, poles, circuit breakers and bushings, or tie-in of new equipment or power lines. Unplanned outages may occur when equipment such as transformers or relays fail due to catastrophic events by simply aging.

As the electric grid faces these challenging forces, a strategic process — relying on the right approach, tools and software — to address widespread outages is imperative.

But utilities are not always built to handle these challenges. The culture is focused on providing safe and reliable electricity rather than project delivery, which can result in struggles with effective project management. Part of this is the sheer scope of the work. According to the U.S. Energy Information Administration, aging portions of the grid drive more than $50 billion in capital spending on distribution systems annually.

Outage management is often siloed or an afterthought in typical project execution; disconnects between various departments are common. Another element is the lack of ease with technology, especially in organizations where many pieces of software — new and old — interact. It's not unusual to see one department tracking outage work through software while another relies on color-coded Excel spreadsheets.

In urgent situations — a category that encompasses all outages — such disconnects and challenges are magnified. With planned outages, it's the pressure of executing millions of dollars of work within a tight timeline, often made tighter by customer load and seasonal restrictions. Unplanned outages are stressful because of the very nature of the problem; every instance is an emergency.

A NEW MINDSET FOR OUTAGE MANAGEMENT

Many utilities use an outage management system (OMS) to plan and track outages, while other utilities use project management (PM) software such as Primavera P6 and Unifier to plan and schedule projects. This lack of integration can result in delays and inefficiency, where the project team is not aware of shifting outage windows.

Linking OMS and PM software can make a dramatic difference in improving efficiency and reducing outage durations. Most people think PM software is most useful for long-term, planned projects. But applying proven PM technology and processes to outage management can also enhance a utility's ability to prepare for planned outages and quickly respond when unplanned outages occur.

For example, sending a project scheduler to the site of a failed transformer to work directly alongside the utility's project manager allows for the development of an hour-by-hour schedule for all activities needed to get the new transformer online quickly. The schedule can be quickly pivoted to serve many needs — filtered to show only critical path activities, or only activities belonging to one department, such as systems testing, procurement or civil construction. This type of scheduling can also provide real-time updates to operations about when these assets will return to service.

This schedule becomes the cornerstone of the replacement activities, with all project stakeholders — from engineering and environmental, health and safety to construction and operations — using it to guide their actions. With one utility client, we used this approach to cut emergency transformer replacement times in half, helping to avoid possible blackouts or further damage to its networks. In addition, the utility was able to extend its forward planning from three months to two years into the future. And this is just one example; every outage is an opportunity to apply this mindset in driving efficiencies.

With this approach, utilities can also harness the power of big data. When all the data points that follow the outages are maintained, the opportunities to report on specific elements are endless. Real-time reports can identify red flags, track changes in outage classification and profiles, help manage resource allocation and ease decision-making with information customized to different audiences. The benefits compound with each of the thousands of annual outages a utility must manage.

STEPS TO INCREASED EFFICIENCY

A consultant team can spotlight new technology tools that work for a utility's specific challenges — and help an organization visualize how existing technology can be leveraged to improve processes. The journey to greater efficiency begins with a few simple steps:

- **Step 1:** Gain a deep understanding of how a utility's process currently works, setting the groundwork for a more effective future plan. Who are the key stakeholders and what are their touchpoints? What tech is being used — and not used? What cultural or technical adjustments are necessary to drive collaboration?
- **Step 2:** Demonstrate the effort's potential outcome, which is important to earning buy-in from various departments. The consultant team can spotlight the value and power of data delivered through an easily accessible, visual environment.
- **Step 3:** Integrate technology to help create a process that's easier for all departments to utilize. Most utilities pay for sophisticated software, but only take advantage of a small percentage of its capabilities. The consultant team helps up that percentage considerably and connects the dots between various pieces of software, always considering cybersecurity issues.
- **Step 4:** Coordinate workflow environments to streamline the outage management process. With a fresh perspective to problem-solving, efficiencies and opportunities for automation can be identified to create a toolkit utilities can deploy easily and effectively.

PROACTIVITY THAT REDUCES THE IMPACT OF OUTAGES

Unplanned outages are becoming more common and planned outages are becoming more necessary. Even if an aggressive approach to grid modernization is in progress, the results are at least a few decades into the future. Utilities must move quickly and proactively to minimize outage durations and maximize the uptime of their equipment, or else risk blackouts and further failures on their systems.

Linking OMS and PM software — and putting into place a more cohesive and collaborative process — helps a utility greet the challenges of outage management as efficiently as possible, lessening the impact of outages on individuals and businesses.

BIOGRAPHIES

COLLIN HAYWARD, PMP, Proci CCM, 1898 & Co. is a utility consulting manager at 1898 & Co., a business, technology and security solutions consultancy, part of Burns & McDonnell. He helps electric utility clients achieve success through outage coordination, operations planning and program management. His more than 10 years of experience includes the development of custom outage management solutions, optimization of outage planning procedures and analysis of outage constraints.

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