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Outages Are Safe, Right?

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There is one outage fact that gets little argument or pushback: Make sure *everyone* on the job site leaves each day without illness or injury. And when the tasks involve electrical work, the additional hazards and attention to detail along with requirements for qualified workers becomes even more important.

During a maintenance outage, multiple crews will be brought in to complete it as quickly as possible, plus there will be multiple disciplines working on various types of equipment and systems. This article will look primarily at the electrical side of an outage.

Hazards and Risk

When everything is de-energized, what could be hazardous? There's actually a sizable number of hazards that could arise in the course of performing work.

Lack of communication is one such hazard. When one crew works on a system and the next crew coming in does not know (or makes assumptions) about what the condition or integrity of the system is, it can lead to incidents. One simple method is help communication is filling out and following a proper job safety analysis (JSA), which verifies each step is completed to help with communication between crews.

A good JSA will also enable the workers to implement a risk assessment for their tasks. Could there be backfeeds from supposedly de-energized equipment? How could those backfeeds occur? Is there an up-to-date single-line diagram to plan the outage and ensure the equipment or system is de-energized? The JSA helps with all of this.

Backfeeds And Absence-of-Voltage Testing

When the lights go out during a maintenance shutdown, people naturally assume all electrical power is removed and it is safe to do their tasks. The opposite may very well be true. It takes special training and safety equipment to test and verify the absence-of-voltage. See Figure 1.

Figure 1
Absence-of-Voltage Testing

When the absence-of-voltage task is being performed, it is required to ensure the voltage detector is working properly. Therefore, it is required to test the operation of the voltage detector on a known energized source. Then test the electrical equipment for absence of voltage, and reverify proper operation of the voltage detector again on a known source to ensure it is still working properly. This is commonly known as the "live-dead-live" test.

There can also be the danger of partially-energized equipment, especially switchgear and switches. One section could be de-energized and safe, while a section next to it could still be energized. Proper absence-of-voltage testing is the only way to determine this situation, and all equipment should be considered energized until it is proven to be de-energized. Also, any energized sections should be clearly marked to warn others, especially when dealing with "look-alike" equipment.

Other Types of Issues

Are temporary personal protective grounds being used? Proper identification of temporary grounds is needed, where they are located, and when they are removed. Any medium- and high-voltage system is not considered de-energized until it is tested for the absence of voltage and the phases grounded.

Another special hazard? DC voltage. Many people don't even think about testing for dc voltage, from capacitors, batteries, etc. Speaking of dc systems, battery banks present some special risks. There is no way to de-energize them, but they still require maintenance.

Summary

This article highlights some of the more common safety issues facing electrical workers/technicians during a maintenance outage or shutdown. But be forewarned! It certainly does not cover all of them, but hopefully provides food for thought when planning such a process, because that is what it is; a process. During the outage things can change moment-by-moment and the supervisory team will be required to respond to those changes. Make sure you keep the impact of electrical safety front of mind as those changes occur. Communicate. Communicate.