



POWER OF STOs

By: MARK PUSTEJOVSKY
Senior Vice President, Workforce Development
Shermco Industries

Preparing for a safe, event-free electrical turnaround

A smooth shutdown and startup during a turnaround starts with proper planning. This planning may begin months prior to the shutdown and requires an understanding of the tasks being performed by each discipline working at the site. During turnarounds, many different disciplines of workers are required, and each discipline will have different missions and goals to be completed. One discipline's progress can greatly affect another — sometimes in a negative way, if planning is not done correctly. Therefore, milestones must be set for each trade or discipline, and an understanding of how one group will affect another is required.

Electrical maintenance is often one of the disciplines. Key electrical maintenance tasks performed during turnarounds may include de-energizing some or all of the facility. With that being said, because all the other disciplines working at the site will probably require lighting and power to perform their tasks, de-energizing may not be a simple matter of just turning everything off. Detailed planning is required ahead of the turnaround to ensure adequate lighting and power for tools is available not only during electrical maintenance, but for other crafts such as welders and HVAC technicians who may be working at the same time. Typically, temporary standby generators are used to power key lighting and electrical panels. A thorough understanding of the facility's single-line diagrams, interconnecting equipment and required safety systems (if appropriate) is also needed. From a safety standpoint, it is also critical to clearly mark temporarily energized equipment because workers may assume everything is de-energized if the main switchgear is turned off.

There may be processes in the plant that can only be taken down for very short periods. In these cases, increased staffing of electrical technicians to complete the work may be required to keep the duration of the outage to a hard limit. With larger crews of electrical technicians, more planning is required so every worker knows what equipment needs to be locked out, what equipment others are working on that may affect them, what tasks need to be done and how the equipment they are working on could affect other workers, etc. There may even be situations where equipment is partially de-energized, such as when a circuit breaker is de-energized next to an energized tie-breaker or when a tie-breaker remains energized on both line- and load-side buses. Complex situations such as these require testing capability and an experienced maintenance team with an excellent safety record.

Even with proper planning, critical items that need power can be missed. Power may be turned off to part of the facility, and critical systems may become unexpectedly de-energized.

This can cause delays and unproductive use of resources while the next step to resolve the issue is determined. Keeping a log of critical items discovered is very important for planning future turnarounds. Notes from previous outages should be used when planning a turnaround. Far too often, this information is stored in one person's head and never formally documented as a reference for others.

Because parts of the electrical system may be temporarily fed from generators, it is very important to communicate the potential risks from this to all electrical workers. Part of the planning process should be to show locations of temporary power on single-line drawings. Accurate single-lines showing the locations of temporary power are critical to allowing electrical workers to make good decisions about how to protect themselves. Relying solely on word of mouth to communicate what is on temporary power and what is de-energized can lead to miscommunication and potentially disastrous results.

As with all electrical maintenance activities, workers should always assume everything is energized until it is locked out, checked for absence of voltage and grounded. Above all else, "test before touch" every time you make contact with any electrical equipment, whether it is known to be de-energized or not.

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