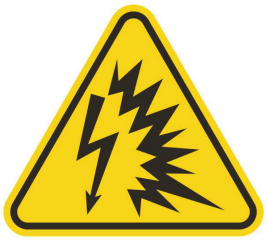
TOOLBOX TALK #20

UNDERSTANDING ARC FLASH

The number one cause of arc flash is simple: human interaction with equipment. Even if an asset has been de-energized before any type of inspection or maintenance activity takes place, there's still a small amount of electrical charge within the system. The still-charged particles aren't affected only by internal issues, but are also attracted to metallic objects nearby when the panel is removed. These tend to include eye glasses, belt buckles and keys to name a few. If conducting any open-panel activity, removal of all metallic objects from a worker must accompany the use of properly rated PPE.



Although proper PPE is a component of NFPA 70E's Hierarchy of Risk Control Methods, it's rated very low. Instead, equipment and procedures should focus on the hierarchy's top two tiers: elimination and substitution. The safety and reliability technologies that have been developed over the past few decades now make it possible to eliminate most risk-based behaviors. Instead of employing "maintenance" processes that are calendar-driven through a computerized maintenance management system in which panels need to be open for equipment to be inspected, adopting a no-touch system based on asset condition monitoring allows for closed-panel monitoring and inspection.

With the use of wireless temperature monitoring system, asset conditions can be continually collected, trended and assessed. Monitors feed data through a gateway to software and apps, allowing the information to be continually accessed from work stations and mobile devices. When the asset-condition data exceeds the customer parameters, alarms can notify technicians of a possible issue that may require inspection. Keeping human interaction with the equipment to only instances in which confirmation inspections of potential faults are deemed necessary, minimizes worker risk of arc exposure and eliminates the human-error threat to asset functionality.

Once the wireless monitoring system notifies technicians of a possible issue with a piece of electrical equipment, the use of pre-installed inspection windows on the asset allows a safe, efficient method of inspecting and assessing any possible issue during an energized condition. Visual, infrared and ultrasound inspections can be done simultaneously by a single employee. This design protects inspectors from arc flash/electrocution risk and removes the need for bulky and expensive PPE.

Electrical power assets being monitored remotely cuts down on technicians' exposure by providing around-the-clock coverage. When an alarm notification is received, correctly designed and installed inspection windows allow an individual technician to safely do visual, infrared, ultrasound and partial discharge assessments of the energized equipment. The panels remain closed, the risk of arc flash/blast is minimized and worker safety (and efficiency) is maximized.