

Testing Times

A Newsletter for the Electrical Construction and Maintenance World

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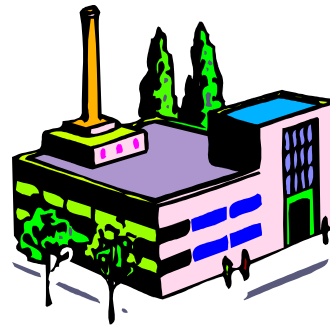
Mystery Unveiled - Ground Faults

The electrical industry spends a lot of time talking about ground fault protection systems, but you may wonder: what is a ground fault and why is this topic important to me? A ground fault occurs when a phase conductor becomes exposed to grounded metal (switchgear enclosures, conduit, etc.) creating a ground return path. When this occurs, the phase to neutral voltage causes fault current to flow through this new and unintentional ground return path.

The magnitude of this ground current can vary. High level faults in the overload and short circuit range can be quickly detected and cleared by standard overcurrent protection (fuses, circuit breakers). Detection of low level ground faults with standard devices is not practical because the magnitude of the current is outside of the overcurrent device time current characteristics. This situation creates a tremendous fire hazard because distribution equipment can be subjected to considerable low level arcing ground fault damage.

The electrical industry addressed this situation in the 1971 National Electric Code (NEC) by requiring ground fault protection systems. These systems were designed to operate in the lower magnitude ranges not covered by standard overcurrent devices. The NEC (Article 230-95) requires ground fault protection of equipment on service entrance equipment rated 1,000 amps or more operating at 480Y/277 volts.

In 1978, the NEC went one step further and began requiring Performance Testing of ground fault protection systems (Article 230-95(c)). This requirement specifies that the ground fault system shall be tested when first installed **on site**. This mandate came "as a result of numerous reports of ground fault protection systems that were improperly wired and that could not or did not perform the function for which they were intended", according to the NEC Handbook.



Many local electrical inspectors strictly enforce this NEC requirement and will not allow service entrance equipment to be energized until the ground fault system is performance tested on site. Unfortunately, in other locations, inspectors wear many hats or are uninformed, and ground fault testing is not mandatory. As a building owner, consulting engineer, or contractor, you have an obligation to your facility and people to ensure that the ground fault protection system will perform when necessary. An inoperable system is no better than not having one at all.

How To Choose A Testing Firm...

The electrical distribution system is one of the most important yet neglected systems in almost any facility. Taking care of this system from the very beginning is critical to its long term success, efficiency, and life expectancy. Due to the vital

To ensure that those working to test and maintain the system are fully qualified.

Many facilities are capable of performing the majority of the maintenance and testing in-house. However, as layoffs and cutbacks become the norm, more and more companies are looking for outside expertise to fill this role. A long term relationship with a testing firm who knows your system can be very advantageous. Often, the familiarity with your system and response time can outweigh any apparent cost savings by putting all work out for bid.

One common testing firm criteria often found in specifications is membership in NETA, which stands for InterNational Electrical Testing Association.

continued

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