

Testing Times

A newsletter for the electrical construction and maintenance industry

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Commissioning vs. Testing

Historically in the electrical industry, the terms commissioning and testing could be used interchangeably. However, the complexity of many of today's electrical distribution systems begs for a distinction in this terminology. Electrical testing can best be described as component testing. It is making sure that all of the individual components are functioning properly. Testing should always be the first step in the electrical start-up process.

Commissioning is literally defined as "putting into active service." This definition implies that it is the next logical step in the start-up process and one that is still overlooked in many cases. Commissioning is performed after all the testing is completed. It is making sure that all the components function together as designed and installed. Commissioning involves such steps as simulating a power failure at different points in the distribution system to make sure that equipment transfers, bypasses or alternate power sources operate as designed. It also documents that all items in the design and testing specifications have been



Don't assume your facility will function as intended if you don't perform commissioning

addressed. For example, an item that might be specified is to set all overcurrent protective devices (circuit breakers and relays) per the coordination study provided with the project. In many cases this step is overlooked. The devices are tested but never set per the study, and breakers are left at their factory minimum settings almost guaranteeing coordination problems and nuisance tripping after energization.

In some cases, the commissioning process uncovers not only equipment problems but also design flaws. Even though a system operates as it was designed, the design has

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Electrical Testing Specifications

We recently were asked to quote the electrical testing per specifications for a hospital. This hospital was adding on and renovating their facility. The project included relocating electrical distribution equipment such as automatic transfer switches (ATS) and panelboards and adding new circuit breakers to space in existing main switchboards.

After reviewing the testing specifications, we had many questions and concerns. Why? Because the specs were asking for the wrong work to be done. When major critical equipment is being moved, such as ATSs and panelboards, testing should be done after installation in its new location. This was not specified. When new breakers are being added to an existing main switchboard or anytime a significant addition or renovation occurs, a new short circuit and coordination study along with an arc flash hazard study should be performed. Again,

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unintended and undesirable consequences. Through the commissioning process, these situations can be addressed and remedied.

We were recently involved in a high profile project that specified electrical testing but no commissioning. After the testing was completed, the plan was to gather all the relevant parties; building owner, electrical contractor, general contractor, etc., and have the utility pull their main fuses to simulate a power failure. This would assure everyone that the generators would come on, loads would transfer and all would be well. The utility pulled the fuses, the lights went out, and the lights stayed out. Problems in the communications systems kept the system from operating as intended. This is not the way to commission a complex electrical distribution system. Commissioning is a very time consuming and intense process, but the results are a fully functioning, fully documented system that presents no surprises. Any facility with a complex distribution system and life safety issues or critical operations should perform electrical testing **and** commissioning. ❖

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this wasn't specified. These new breakers need to be primary injection tested; but that was also not specified.

What was specified were items like "indicate all circuits and equipment are ... operable by demonstrating the functioning of each control device not less than ten (10) times..." No one with any electrical testing knowledge would consider turning a breaker on and off ten times as testing. Basically, what was called for was meggering circuits, checking phasing, recording motor full load current, setting motor protection above inrush and turning control devices on and off ten times. What should have been specified is a new short circuit, coordination and arc flash hazard study, along with testing of ground fault systems, circuit breakers by primary injection, automatic transfer switches and panelboard main breakers.

Allocating money for electrical testing and commissioning is often a hard sell but important and necessary. Spend your money wisely on assuring yourself you have a system that works. ❖

All questions, comments and topics for future discussion are welcomed. If we use your topic in a future *Testing Times* issue we will send you a \$25.00 American Express gift card. Please send to Ms. Lyn Cosby at e-mail Lcosby@hoodpd.com.

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