

Testing Times

A newsletter for the electrical construction and maintenance industry

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Zone Selective Interlocking

In protecting electrical distribution systems, two mutually exclusive objectives are limiting damage to equipment and continuity of service. On one hand, the protective system is supposed to limit damage due to electrical fault thermal stress by interrupting the electric source as soon as possible. On the other hand, electric service

ZSI can minimize thermal damage caused by faults in low voltage power distribution systems.

to an entire facility should not be interrupted for minor electrical problems. The best compromise between these two objectives, which is no compromise at all, is zone selectivity.

Zone selective interlocking (ZSI) is a way of having electronic trip units communicate with each other so that a short circuit or ground fault will be cleared by the nearest source device with no intentional time delay. By clearing the fault with no intentional time delay, the electrical fault thermal stresses are minimized. The communications between adjacent trip units allows only the closest source device to operate thus leaving the remainder

of the system uninterrupted. Each manufacturer performs the communication between adjacent trip units differently. The main idea is that if a trip unit senses a fault, it will trip without an intentional time delay unless it receives a signal from a load side device saying that it is tripping for the fault. If the source side trip unit does receive such a



The benefits of ZSI can be maximized by a coordination study.

signal that the load side device is going to trip, the source side trip unit reverts to its normal time delay trip scheme. The normal time delay trip, if properly set, allows the load side device to operate within its normal time

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A new concept:

Commissioning

Electrical testing is an extremely important part of the start up of a new facility. Electrical testing involves the testing, at a component level, of all the critical devices that make up the electrical distribution system. Unfortunately, electrical testing alone may not be enough to ensure the proper operation of the entire electrical system. As

Commissioning is the process of identifying the desired response of the electrical system to various occurrences.

electrical equipment becomes more sophisticated, even the simplest of buildings can have complex electrical and electronic components, i.e., solid state electronic trip circuit breakers. The more complex the components and systems, the greater the need for an increase in the degree of testing; hence, commissioning. Commissioning can be described as the process of identifying with the design engineer the desired response of the electrical system to various occurrences (faults, load adding and shedding, loss of

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delay and the source side device has enough time delay that it will not trip, unless the load side device fails to trip. This allows settings to be chosen that give a perfectly coordinated protection system but trip instantaneously for faults within the protection zone, thus providing the best possible protection.

According to Square D Company, the use of ZSI is on the rise "primarily due to an increased availability of electronic trip devices with ZSI capabilities. Additionally, more system designers, specifiers and users are beginning to visualize the potential of ZSI protection." ❖

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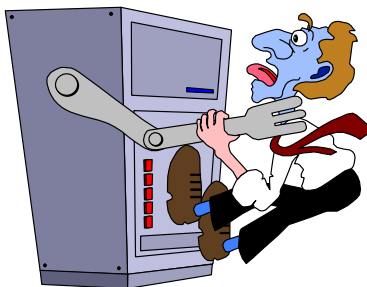
If you would like additional information about the following:

- Commissioning
- Coordination Studies
- Company Information

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Commissioning (continued from page 1)

power) and verifying that the system as a whole responds as anticipated. The commissioner should also provide thorough documentation of these operations and tested responses, providing assurance that the system is operating as intended, as well as for future reference and troubleshooting.



System malfunctions can cause dire consequences and cost a company millions.

The InterNational Electrical Testing Association (NETA) specifies commissioning in its most simplistic terms: "Perform system function tests upon the completion of equipment tests... It is the purpose of system function tests to prove the correct interaction of all sensing,

processing, and action devices."² This degree of attention is common in facilities such as data centers where any equipment malfunction may cause dire consequences and cost a company millions. However, no facility or system is too small to negate the benefits of this type of testing. The commissioning firm will interact with the design engineer, owner, electrical contractor, and all manufacturers associated with each project. The commissioner can be instrumental in resolving conflicts between the different companies and equipment. The commissioner will become involved in a project with one goal: to understand the intent of the system and to verify that it responds properly in all scenarios.

Is this type of consulting service expensive? Depending on the complexity of the system it certainly can be, but generally, the cost of commissioning is relative to the importance and size of the electrical system and well worth the extra cost. ❖

² Maintenance Testing Specifications - 1997, NETA

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inside:

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