Hood-Patterson & Dewar, Inc. Electrical Engineering and Testing Winter 2000

Testing Times

A newsletter for the electrical construction and maintenance industry Volume 7 No. 1

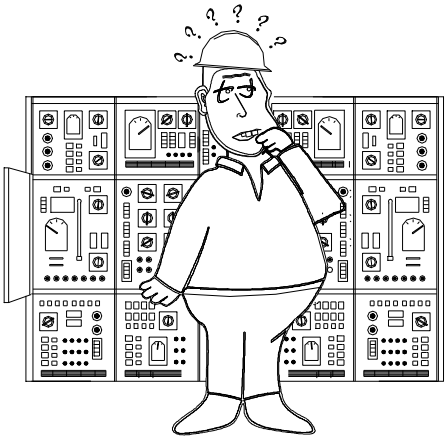
Short Circuit and Coordination Studies

Several times in the last few months, we have come across electrical testing and commissioning specifications that call for the contractor to:

> *"Set field-adjustable devices to dial and tap settings providing maximum coordination, subsequent to installation of units".*

What does this statement mean? How is the contractor supposed to set the devices for maximum coordination? The answer is, he can't! In fact, no one can "look" at a system and set the devices appropriately. Setting the devices is extremely important to the safety and up time of an electrical distribution system, but the only way to accomplish the proper coordination is to perform a **Short Circuit and Coordination Study**. As the name suggests, this study provides two key pieces of information for every device included: the available short circuit current at that location and the settings required for maximum coordination with other devices up and downstream. The study is accomplished by looking at all types of data related to the electrical distribution system including:

- Utility/source available short circuit current with X/R ratio
- Type of utility overcurrent protection
- One-line/riser diagram
- Project specifications
- Conduit/cable list with types, numbers, lengths, etc.
- Switchgear, switchboard, MCC and panelboard submittals on new equipment
- Similar data on any existing equipment
- Motor info on 40HP and above (number, size, voltage, running load amps, etc.)
- Generator data
- Transformer data
- UPS data



Nobody can look at an electrical distribution system and know how to set the devices for maximum coordination

The above list is usually the minimum data required to perform a short circuit and coordination study. After all this info is obtained (a task in and of itself), then the settings are obvious, right? Not yet. With the assistance of software, the professional engineer must combine all this information with his experience to ascertain the appropriate settings for maximum coordination.

Once you enter all the data into the software program, you might think the program spits out the right answers for the settings.

(continued on page 2)

News you can use!

Another study?

You had a Short Circuit and Coordination study done when your facility was first built, but that was 10 years ago. You probably should have a new study done. "Why?", you ask. Because in many cases, the data that went in to your study has changed, meaning your study is obsolete.

(continued on page 2)

HOOD - PATTERSON & DEWAR INCORPORATED
ELECTRICAL ENGINEERING AND TESTING
POST OFFICE BOX 1048 • DECATUR, GA 30031
TELEPHONE (404) 296-5990 • FAX (404) 299-3534
www.hoodpd.com

(SCCS, Continued from page 1)

Unfortunately, it's not that simple. Many devices don't coordinate cleanly with devices up and downstream. This means the engineer must sometimes make judgments and tradeoffs in favor of increased equipment and life safety versus maximizing the up time of the system. The engineer's experience is invaluable in making these extremely critical decisions about coordination issues.

So, can the contractor look at a system and set the devices to provide maximum coordination? Not a chance. But a **Short Circuit and Coordination Study** performed by an experienced engineer has all the answers! ❖

(Another study?, Continued from page 1)

A perfect example came up recently. We were asked to provide a new study for a facility built in the 1950s. As a result, we discovered that many panelboards were severely under-rated based on the available short circuit current.

What does this mean? When these panels were built, a lot less was known about short circuit currents and their dangers. Through research, we found that some of these overcurrent devices were only rated 7500 or even 5000 AIC (amps interrupting capacity). This rating is the amount of short circuit current that the device is safely able to interrupt. The new study found the available fault currents to be much higher at many of these panels. So what happens? If a short circuit occurs at one of these underrated panels, instead of being able to safely interrupt the short circuit by operating, the device would most likely be destroyed possibly leading to catastrophe.

Your facility is a lot newer so you don't have a problem, right? Maybe yes, maybe no. Even in newer facilities, equipment can change through additions, renovations, reconfigurations, utility source changes, etc., rendering your original study obsolete. It's a good idea to have a new study performed every 5-7 years. ❖

Free Testing Times Binder for the first 50!

Want to keep all your informative Testing Times newsletters for reference but don't have a good place for them? Let us send you a **free** 1" binder for saving your newsletters. Fax this page to (404) 299-3534 or e-mail Lyn Cosby at lcosby@hoodpd.com and the first 50 responders will receive a binder with the Testing Times logo and all back issues.

HOOD - PATTERSON & DEWAR INCORPORATED

ELECTRICAL ENGINEERING AND TESTING
POST OFFICE BOX 1048 • DECATUR, GEORGIA 30031

inside: