

Toolbox Talks 2

041: Unsafe Acts: Startup Testing

Discussion leader duties for this session:

If your company has any start-up test procedures, read through one or two so you can talk about them as examples, if needed.

What this Safety Talk covers:

Most injuries occur not due to unsafe conditions, but due to unsafe acts. This Safety Talk addresses unsafe acts when doing the typical startup tests.

Discussion notes:

Background

Startup testing typically consists of point to point wiring checks to show the wiring is correct, and insulation resistance tests to prove cable integrity. These, along with ground testing, are obviously performed with no power. Additional tests may include operational testing of breakers, voltage measurements, and various functional tests. More elaborate testing is normally outsourced to a specialty testing firm.

Some unsafe acts in startup testing

- Jumping right in, when doing wiring checks. Take a few minutes to ensure the system hasn't been energized, you are at the right equipment or cabinet, you have the correct drawings, and you have adequate light in which to work.
- Performing hi-pot tests without isolating first. The hi-pot is injecting a high voltage signal, so isolate the cabling at each end. Follow the manufacturer's safety precautions, also.
- Not wearing the correct PPE during testing. It's a common problem during wiring checks and cable testing that people get lax about PPE. Minimally, this consists of hardhat and safety glasses. Other PPE may also apply.
- Ignoring the shock hazard presented by unbonded metallic objects. If a piece of equipment doesn't have a bonding jumper, a difference of potential exists. If, for example, you see a motor "grounded" via a ground rod, it's likely the rod was used in place of proper bonding and the motor presents a touch shock hazard.
- Neglecting tool inventory. One reason for startup testing is to detect tools inadvertently left in the wrong place. Know which tools you have with you at the start, and which ones you have when you're done. One simple way to do this is to keep a list of any tools you are using. Then, go over the list at the end of your shift and make sure every tool on it is present and accounted for.
- Using an insulation resistance tester or hi-pot in a manner contrary to manufacturer's instructions. These devices can provide a lethal shock. Various models differ in rules of usage; consult the manual to learn how to use a particular one safely.
- Conducting tests for which you are not qualified. It's one thing to prove correct wiring and cable integrity prior to startup. It's quite another to do commissioning tests on MV and HV switchgear, MCCs, backup power systems, fire alarm systems, generators, protective relaying, or other specialized systems.
- Changing settings on breakers and relays. Determining the settings is an engineering function that involves some legal liability and has safety implications. Leave these settings alone.

Review and discussion

1. What are the typical startup tests that are performed with no power applied to the equipment under test? What PPE, at a minimum, do these tests require?

- Participant's Signature and Date***

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