

DISCLAIMER: These Standard Operating Procedures (SOP's) are for the exclusive use of Navy Public Works Center (PWC) Norfolk. They are promulgated as guidance for their NAVFAC Commands. If intended to be used by other activities, they must be tailored to each activity's particular requirements and must be reviewed/approved by the activity's safety professionals prior to use.

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## INSULATION RESISTANCE TESTING OF LOW VOLTAGE SWITCHGEAR

### **Purpose:**

SOP for testing the insulation resistance of 600 volt metal clad switchgear.

### **Potential Energy Sources:**

Backfeed from ship, Primary feed, capacitors on MUSE/Mobile Substations.

### **Tools and PPE:**

Hard hat, Electric safety shoes, work gloves, 2500 volt megaohmmeter(meggar).

### **References:**

1. OSHA 1910 safe working practices.
2. OSHA 1910.333 table S-5 approach distances.
3. NEETA ATS.
4. Westinghouse Digitrip Manual.

### **Procedures:**

**Wear all PPE during this entire procedure**

1. Follow "HV Lockout/Tagout" and "Vault Entry Procedures" to deenergize transformer and switchgear and for vault entry. (Note this includes testing the switchgear deenergized)
2. Remove rear enclosure doors located behind the secondary main breaker and the transformer secondary bushings.
3. Remove any grounds on the secondary or the primary of the transformer and switchgear.
4. With the secondary main and feeder breakers closed perform a 1000 volt meggar test for 1 minute phase to phase and phase to ground. Record values. Values should be greater than 2 megaohms.
5. Open the secondary feeder breakers and the secondary main breakers. If the breakers have Westinghouse Digitrip trip units, remove the PT shorting plug. Disconnect the CPT and PT by

removing the fuses or use other disconnecting means. Attach meggar leads on the bus located on the load side of the secondary main breaker and perform a 2500 volt meggar test for 1 minute phase to phase and phase to ground. Record values. Values should be greater than 100 megaohms(In below ground pier vaults or on Muse/Mobile substations located on the pier values should be greater than 25 megaohms). Note on switchgear with no secondary disconnects from the transformer skip step 5 since, it is not recommended to apply 2500 volts to the transformer.

6. Attach meggar leads on the bus located on the line side of the secondary main breaker and perform a 1000 volt meggar test for 1 minute phase to phase and phase to ground. Record values. Values should be greater than 100 megaohms(In below ground pier vaults or on Muse/Mobile substations located on the pier values should be greater than 25 megaohms).

7. When completed ensure all breakers not tagged for repair are racked in and ready for shore power.