

Safe Work Practices

<p>Title:</p> <h2>Megger Insulation Testing</h2>	Reference:	Revision:
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1.0 SAFETY

- 1.1 Do not connect the megger to energized equipment or cables.
- 1.2 Wear your HV gloves.
- 1.3 Keep clips isolated from accidentally touching people or unintended equipment or conductors.
- 1.4 Do not touch the apparatus while testing. Keep in mind that the other end of the cable or another bushing will be energized when testing.
- 1.5 When a cable or a piece of equipment is tested with a megger it will build up a charge. Depending on the surface area of the conductor and quality of the insulation this charge could be store for a long time. The charge can be brought down to a safe level by shorting the two test points together for the same duration as the test. A Hasting meter or other proximity or AC meter will not be able to measure this stored DC energy, a DC Voltage meter must be used.
- 1.6 Do not use in an explosive environment.

2.0 CHECK THE MEGGER IS FUNCTIONING PROPERLY

- 2.1 If the battery charging cord is connected disconnect and store in bag.
- 2.2 With the unit off verify the needle is pointing to infinity, if not it can be adjusted.
- 2.3 Plug the red lead in the + terminal and the Black lead in the – terminal.
- 2.4 Making sure that the clip ends are isolated from each other and everything else. Set the voltage to 500 v and press the test button, the needle may jump but should quickly return to infinity and stay there.
- 2.5 Connect the clip ends together keeping them isolated form everything else. With the voltage still set on 500v press the test button the needle should quickly go to 0 ohms and stay there till you stop testing.

3.0 TESTING

- 3.1 Perform all necessary switching and tagging and risk assessments.
- 3.2 Make sure that the apparatus is de-energized and isolated from any potential or ground. For example, terminator disconnected from cutout and the elbow from the transformer bushing.
- 3.3 Clip the positive lead to the conductor you want to test the insulation of. For example the center conductor in a cable.
- 3.4 Clip the negative lead to ground or to a conductor that is on the other side of the insulation from the positive conductor. For example the concentric neutral on a cable.
- 3.5 Set the test voltage on the megger. The voltage should be no more than twice the normal operation voltage of the equipment. 15 KV cable test at 5KV a 600 volt cable test at 1KV.
- 3.6 Apply the test voltage for 60 seconds at the end of 60 seconds recorded the results and stop test.
- 3.7 While wearing your HV gloves short the two test points together for 60 seconds. To allow the capacitive charge to dissipate.
- 3.8 Remove and pack up tester.

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4.0 ANALYZING THE RESULTS

- 4.1 A normal or good insulation - When the test first starts the needle will jump to 0 and slowly climb towards infinity after 60 seconds the measured resistance should be 1 Meg ohm per 1 kV of rated voltage or higher. For example testing a 15kV cable a measure resistance of 15Meg ohms or higher would be a good test.
- 4.2 A dead short – When the test first starts the needle will jump to 0 ohms and stay there no needed to continue test if the needle doesn't move off the 0 ohms after 5 seconds.
- 4.3 Poor or bad insulation - When the test first starts the needle will jump to 0 and slowly climb towards infinity after 60 seconds the measured resistance will be below 1 Meg ohm per 1 kV of rated voltage. For example testing a 15kV cable a result bellow 15Meg ohms would be a bad test.

5.0 ADDITIONAL INFORMATION

- 5.1 The guard terminal on a Megger – For most of our testing guarding is not used. The guard is used to isolate out leakage current or can be used to break down circuits further to narrow down what insulation is degrading. It does this by not measuring the current returning though the guard lead.
- 5.2 It is best to disconnect the lighting arrester when meggering a cable.
- 5.3 If a cable passes when meggering from the transformer end, try meggering from the terminator end. It is possible for it to read good one way and not the other, depending on the way cable blew.

Developed by: Travis Jalbert, Brian Gould	Approved by: SWP Approval Committee Stan Hartin, Brad Flannery, Scott Richards, Neil Lyons Brian Gould
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