

**STATE OF OHIO
DEPARTMENT OF TRANSPORTATION**

**SUPPLEMENT 1003
HIGH VOLTAGE DIRECT CURRENT TEST PROCEDURE**

July 17, 2015

1003.01 Procedure

1003.01 Procedure. This supplement outlines the procedures for performing the High Voltage direct current test specified in C&MS 625.19.

1. The main disconnect device shall be locked in the open position. Pole and brackets cable shall be disconnected at each light pole. Sign lights, underpass lights, and all other devices fed by the circuit shall be disconnected.
2. The test shall be performed on each insulated conductor of the circuit and the results recorded and plotted as directed by the Engineer.
3. Conductors shall be tested in the following sequence:
 - a) On the neutral conductor before it is grounded, and
 - b) On the power conductors with the neutral and other conductors permanently or temporarily grounded.
4. With voltage at 0, attach high-voltage lead to the circuit conductor to be tested and the low-voltage lead to ground. Ground the companion conductors of the circuit and proceed as follows:
 - a) Select a voltage scale that will permit continuous measurements without changing scales.
 - b) Slowly increase the voltage from 0 to 750 volts, then to 1500 volts, and then to 2400 volts. At each step, hold for 1 minute and read the current. Record leakage current values and plot a "Leakage versus Step Voltage Curve" on a form similar to that shown in Figure 1.
 - c) Slowly increase the voltage to 3000 volts and hold for a minimum of 5 minutes and a maximum of 15 minutes, taking a current reading

at the end of each minute. Record leakage current values and plot a "Leakage versus Time Curve" as an extension of the "Leakage versus step Voltage Curve".

- d) Return voltage to 0 and ground the tested conductor to remove any capacitive charges.
5. Determine and record temperature of the air and relative humidity at the time of testing.
 6. Faulted conductors and/or connections shall be replaced and the circuit tested until satisfactory test results are obtained.
 7. The test results shall be considered as satisfactory if both of the following conditions are met:
 - a) The maximum required value of 3000 volts can be obtained as provided in 4 (c) above.
 - b) The leakage current remains constant or gradually decreases when plotted from a period of 5 consecutive minutes as described in 4 (c) above.

(See Attachment: Figure 1, Graph of Leakage vs Time)

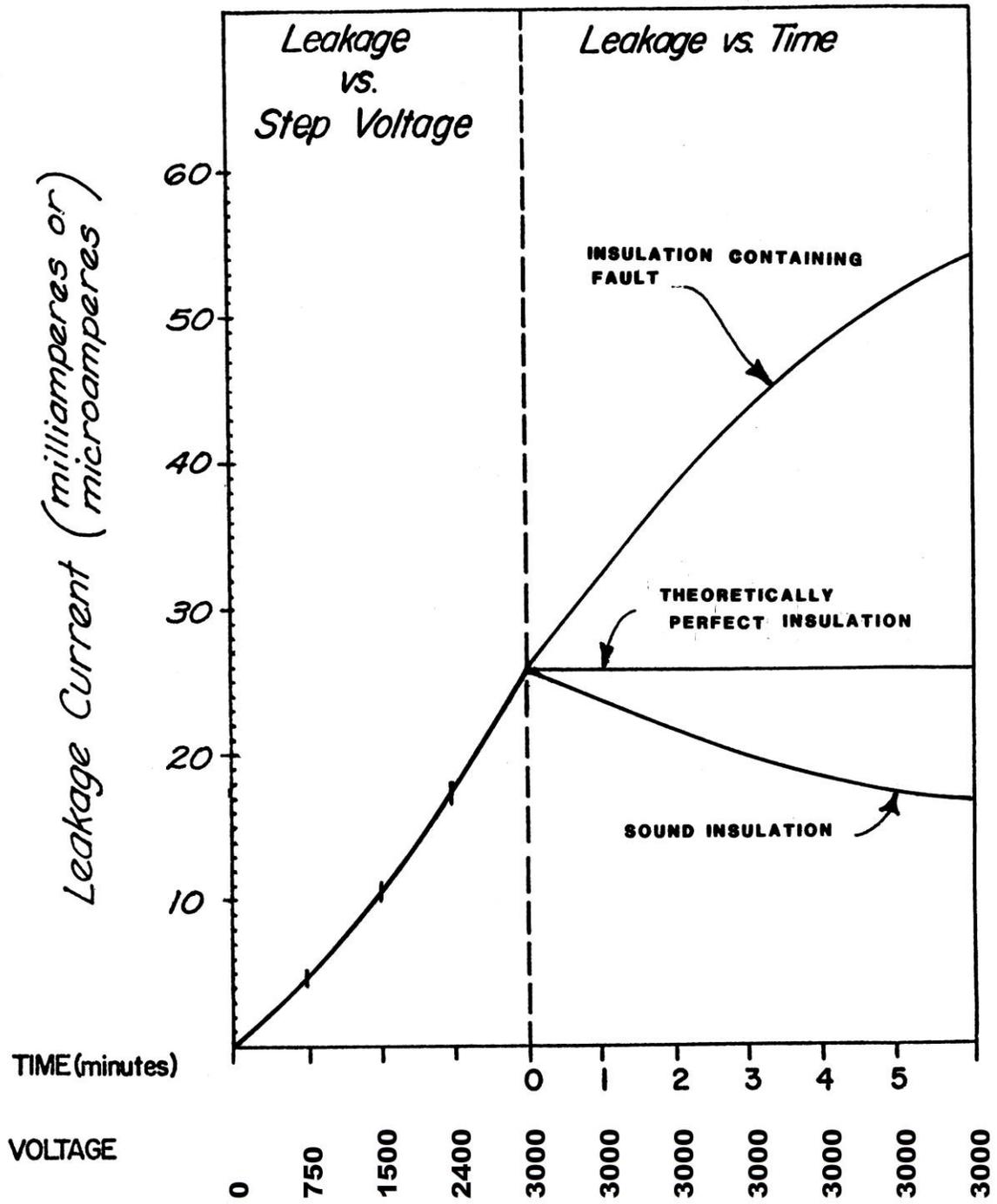


FIGURE 1

ILLUSTRATIVE EXAMPLES OF LEAKAGE VS TIME PLOTS FOR VARIOUS CONDITIONS OF CABLE INSULATION