WESTERN POWER DISTRIBUTION

Serving the South West and Wales

Engineering Business Directive

STANDARD TECHNIQUE : MI14D

Earth Loop Impedance Testing of Services

This document details the Company's required earth loop impedance tests of the Company's service at the point of the supply prior to first connection or following a service alteration.

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Approved by

Technical Metering Manager

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1.0 INTRODUCTION

1.1 WPD's consent to connect to meter operators (POL:NC4) requires that certain tests and inspections are carried out on a service before a connection is energised. Part of that requirement is to test the earth loop impedance.

1.2 Only suitably trained and authorised staff may carry out the tests.

1.3 Polyphase within this ST refers to 3 phase 4 wire, 2 phases of 3 phase 4 wire and 1 phase 3 wire supplies.

1.4 This test shall be performed after polarity (in accordance with ST:MI13B) and phase rotation if polyphase (ST:MI13K) have been tested and terminals marked.

1.5 Only APPROVED instruments may be used, as detailed in EE:SPEC 26, and which have been checked and calibrated in accordance with ST:HS15J, POLMI50 and ST:MI50A/B.

1.6 A variety of earth loop instruments are in use. Those which have three test leads (phase, neutral, earth) should be used by connecting both the earth and neutral prods to the earth terminal, when testing PME. (When testing SNE or cable sheath earth connect the three leads to their appropriate terminals). Test using the phase – earth range. Where there is a choice, test using the low impedance (eg 20 O) or the high current range. If you are unfamiliar with the instrument, seek assistance from your supervisor. Refer to appendix A for specific instrument instructions.

1.7 Instruments are generally 230/240v rated only. Care must be exercised when testing polyphase installations not to put prods across phases.

2.0 METHOD OF TESTING

2.1 Prepare the earth loop tester for use, by connecting the test lead with prods and/or "crocodile" earth clip.

2.2 Inspect the instrument and test leads for damage.

2.3 Wear appropriate PPE in accordance with ST:MI13B for the following steps:-

2.4 If not already removed, remove the cut-out fuse(s).

2.5 If connected, disconnect the customer's earth conductor from the company earth terminal.

2.6 Connect the "crocodile" clip or neutral and/or earth prod to the network earth terminal.

2.7 Insert the fused phase test prod into the incoming phase terminal of the cut-out, take a measurement and check the value is acceptable, as below.

2.8 If polyphase, repeat the test for each of the other phases.

2.9 Remove the fused prod from the cut-out, and then disconnect the “crocodile” clip or neutral/earth prods.

2.10 Reconnect the customer’s earth conductor, if disconnected in para 2.5.

3.0 ACCEPTABLE VALUES

For single phase and polyphase up to and including 200A fusing

a) accept if less than 0.35 O

b) accept if between 0.35 - 0.8 O but refer to action in Failures section

Polyphase up to and including 300A fusing

c) accept if less than 0.2 O

For Polyphase above to 300A fusing

d) accept if less than 0.15 O

For street lighting, accept as below for the following cut-out fuses:

e) accept if less than 13.5 O for a 6A fuse

f) accept if less than 7.1 O for a 10A fuse

g) accept if less than 3.8 O for a 16A fuse

h) accept if less than 2.7 O for a 20A fuse

i) accept if less than 2.1 O for a 25A fuse

4.0 FAILURES

4.1 If the service fails the earth loop test, but the earth terminal is not to be used immediately, label it “earth terminal not to be used” and contact your supervisor to arrange for the earthing to be investigated. The supply may still be connected.

4.2 Except for street lighting services, if the earth loop test indicates a value between 0.35 - 0.8 O contact your supervisor to raise with the planner to investigate. The supply may still be made available for connecting.

4.3 If the test value is not acceptable and the installation requires the provision of an earth terminal, contact your supervisor, and label the service “Not available for use”. In addition, advise the customer (if present or contactable) why the supply can not be connected and what is to be done to rectify it.

APPENDIX A

SPECIFIC INSTRUMENT INSTRUCTIONS

1 Megger LT320

Use only APPROVED fused leads with this instrument.
Set large knob to Hi (current) testing.
Set small knob to Z.

APPENDIX B

SUPERSEDED DOCUMENTATION

None.

APPENDIX C

ASSOCIATED DOCUMENTATION

The Electricity Safety, Quality and Continuity Regulations 2002 (SI 2665)
Electricity at Work Regulations
Distribution Safety Rules
POL:NC4 (Consent to Connect to Other Parties)
ST:SD6R (Earth Loop Impedance at LV Installations)

APPENDIX D

IMPACT ON COMPANY POLICY

This Policy formalises current practice.

APPENDIX E

IMPLEMENTATION OF POLICY

This policy document shall be implemented from January 2005.

APPENDIX F

KEY WORDS

Connection Earth, Energise, ESQCR, Inspect, Loop, Supply, Test.

APPENDIX G

DISTRIBUTION LIST FOR ST:MI14D

FMM circulation list A, B C & D (part 2, Disconnections).