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Engineering Recommendation G12

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Requirements for the Application of Protective Multiple Earthing to Low Voltage Networks

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PUBLISHING AND COPYRIGHT INFORMATION

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Amendments since publication

Issue	Date	Amendment
Issue 4	November 2013	The inclusion of a more comprehensive section on supplies to Rail installations which has been developed with input from Network Rail including the results of voltage rise tests; Improved guidance on other special situations to provide closer alignment with current Standards and Regulations and more accurately delineate areas of responsibility. Modifications directed by Ofgem have been included.
Amendment 1	December 2015	Section 6.2.14 – Clarification on the requirement to install Earth electrodes at street lighting mini pillars using PME supplies.

Contents

Foreword

This Engineering Recommendation (EREC) is published by the Energy Networks Association (ENA) and comes into effect from 1st February 2014. It has been prepared under the authority of the ENA Engineering Policy and Standards Manager and has been approved for publication by the ENA Electricity Networks and Futures Group (ENFG). The approved abbreviated title of this Engineering document is "EREC G12 issue 4", which replaces the previously used abbreviation "ER G12/3".

This Engineering Recommendation takes account of:

i) The Electricity Safety, Quality and Continuity Regulations 2002, as amended

NOTE: Regulation 9 gives requirements for PME; the DTI Guidance Document "Guidance on the Electricity Safety, Quality and Continuity Regulations 2002", Section 9, refers to Engineering Recommendation G12.

ii) BS 7671 : Requirements for Electrical Installations

1 Scope

This Engineering Recommendation sets out the requirements to be adopted when Protective Multiple Earthing (PME) is applied to DNO (Distribution Network Operator, including Independent Distribution Network Operator) overhead and underground low voltage distribution systems and to other public distribution systems connected to those systems under the Distribution Code. These requirements may be supplemented by each Company's own PME code of practice in respect of the detailed engineering and technical requirements of PME application. The requirements in this Engineering Recommendation aid compliance with certain aspects of the requirements of the Electricity Safety, Quality and Continuity Regulations 2002, as amended. The document also considers situations where PME should not normally be used.

2 Normative references

The following referenced documents, in whole or part, are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

This document makes reference to, or should be read in conjunction with, the following documents:

Statutory publications

The Electricity Safety Quality and Continuity Regulations 2002 (SI 2002 No. 2665), as amended

The Electricity at Work Regulations 1989 (SI 1989 No. 635), as amended

Standards publications

BS 7375: Code of practice for distribution of electricity on construction and building sites

BS 7430: Code of practice for earthing

BS 7671:2008 (2011) Requirements for electrical installations. IET Wiring Regulations. Seventeenth Edition

BS 7870-5: LV and MV polymeric insulated cables for use by distribution and generation utilities. Part 5: Polymeric insulated aerial bundled conductors (ABC) of rated voltage 0.6/1kV for overhead distribution

BS 7909: Code of practice for temporary electrical systems for entertainment and related purposes

BS EN 50122-1: Railway applications. Fixed installations. Protective provisions relating to electrical safety and earthing

BS EN 50122-2: Railway applications. Fixed installations. Protective provisions against the effects of stray currents caused by d.c. traction systems

BS EN 62305: Protection against lightning

IEC/TS 60479-1: Effects of current on human beings and livestock. General aspects

ENA Publications

TS 41-24: Guidelines for the design, installation, testing and maintenance of main earthing systems in substations

TS 43-13: Aerial bundled conductors insulated with cross-linked polyethylene for low voltage overhead distribution

EREC C93: Type approval tests for mechanical connections to metallic sheaths of cables

EREC G14: PME. Recommended principles of testing to ensure correct polarity

EREC G59: Recommendations for the connection of generating plant to the distribution systems of licensed Distribution Network Operators

EREC G83: Recommendations for the connection of type tested small-scale embedded generators (up to 16A per phase) in parallel with low voltage distribution systems

EREC G87: Guidelines for the provision of low voltage connections to multiple occupancy buildings

EREC P24: AC traction supplies to British Rail

EREC S34: A guide for assessing the rise of earth potential at substation sites

EREP 123: Guidelines for managing the interfaces between utility services and light rapid transit systems

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

NOTE: Definitions marked with an asterisk are taken from the Electricity Safety, Quality and Continuity Regulations 2002, as amended. Those with a double asterisk are taken from BS 7671:2008 (2011).

3.1 Aerial Bundled Conductor (ABC)

A fully insulated, 4-wire low voltage overhead distribution system, where the wires are bundled, erected and secured as though it were a single overhead line conductor, complying with the requirements of BS 7870-5 and TS 43-13.

3.2 Branch

A sub-division of a distributing main from its end furthest from the source of voltage to its junction with the distributing main.

A branch may be classified as a service line provided that:

- it connects no more than four consumers' installations, of which one or more has a PME earthing terminal

and:

- it is no more than 40 metres in length from its point of connection to the distributing main.

3.3 Caravan

A trailer leisure accommodation vehicle, or:

A motor caravan or motor home, or:

A mobile home or residential park home if certain conditions apply; namely, if any metalwork connected to the earth terminal is within reach of a person in contact with the general mass of earth or they are not permanently sited or not permanently connected to water/sewerage services.