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Engineering Recommendation G9

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Voltage testing devices

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PUBLISHING AND COPYRIGHT INFORMATION

Operations Directorate
Energy Networks Association
6th Floor, Dean Bradley House
52 Horseferry Rd
London
SW1P 2AF

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Amendments since publication

Issue	Date	Amendment
Issue 7	December, 2012	NOTE: Prior to carrying out any amendments, the previous revision was imported into the new ENA engineering document template. As the structure of the new template differs from the previous revision the contents have been assigned to the appropriate section in the revised document and any associated numbering and cross-referencing of Clauses has been updated. Similarly, any changes necessary to comply with the conventions and formatting in the ENA engineering document template and Engineering Recommendation ER G0 Rules, for structure, drafting and presentation of ENA engineering documents have been carried out. These changes may not be 'marked'; however, any subsequent technical, general or editorial changes are 'marked' in the tracked version of the document. Major revision of Issue 6 to reflect that the Approvals Panel on voltage testing devices has been disbanded and reference to the Approvals Panel, its Approvals system and associated requirements are no longer applicable. Consequently, enhanced guidance regarding procurement, approval and use of voltage testing devices is provided. This issue includes the following principal technical changes. Introduction: Reference to the activities of the Approvals Panel deleted with explanatory text included. Remaining text moved to Clause 4. Clause 4 Approval: New clause with guidance to users on the selection and approval of voltage testing devices. Three paragraphs from original Clause 2 "Caution" moved here. Clause 6 In-Service Care: Re-named from Inspection and Maintenance. The text is much expanded to provide more guidance.

		Clause 7 Use: The original text is retained, inserted into the appropriate sub-clauses, and the text is much expanded to provide more guidance. Type Approvals sheets previously included in Issue 6 are obsolete and have been archived by ENA. Archived Type Approvals sheets for voltage testing devices that may be still used by ENA Member Companies are available on request from the Operations Directorate of ENA. NOTE: Assessment Notices sheets issued by the Approvals Panel, which replaced the system of issuing Approval Notices, and which were included in ENA SMCC 003: 1993, *Notes of Guidance on the Assessment of Voltage Testing Devices*, have also been archived. Details of all other technical, general and editorial amendments are included in the associated Document Amendment Summary for this Issue (available on request from the Operations Directorate of ENA).

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Foreword

This Engineering Recommendation (EREC) is published by the Energy Networks Association (ENA) and comes into effect from date of publication. 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 G9", which replaces the previously used abbreviation "ER G9".

This revision replaces and supersedes Engineering Recommendation G9 Issue 6 1978. This document constitutes a major revision of Issue 6 to reflect that the Approvals Panel on voltage testing devices has been disbanded and reference to the Approvals Panel, its Approvals system and associated requirements are no longer applicable. Consequently, enhanced guidance regarding procurement, approval and use of voltage testing devices is provided.

Guidance has been incorporated from the following Standard(s) and publications, which were not available when ER G9/6 was published.

- BS EN 61243 Parts 1, 2, 3 & 5 *Live Working. Voltage Detectors.*
- EA SMCC 003: 1993, *Notes of Guidance on the Assessment of Voltage Testing Devices* [1].

The structure and contents of this document have been aligned with the new ENA engineering document template, which has necessitated re-assignment of the original text into revised Clauses.

This document is intended primarily for staff, who are tasked with the procurement, approval, use, storage, transport and inspection of voltage testing devices.

Commentary, explanation and general informative material is presented in smaller type, and does not constitute a normative element.

Introduction

A voltage testing device is used to check a conductor for the presence or absence of voltage prior to initiating work. It follows that such devices should have an extremely high degree of reliability and their design and manner of use should protect the user from danger even if the conductor is live. The safety rules of user organisations should require items of safety equipment to be approved by a designated person within the organisation.

An Approvals Panel on voltage testing devices supported Member Companies (of the then Electricity Council and later the Electricity Association) up until circa 1998. Voltage testing devices were then Type Approved by the Approvals Panel and a list of approved voltage testing devices was maintained and made available to Member Companies. Subsequently, the Approvals Panel ceased providing type approval support but continued to issue Assessment Notices for new and updated equipment based on laboratory tests, field trials and feedback, to assist Member Companies in selecting and approving equipment. The last Assessment Notices were issued circa 1988 and much of the equipment referred to is now obsolete or no longer manufactured, although some equipment may still be in use by Member Companies. The Type Approval sheets and Assessment Notices referred to have been archived and are available on request from the Operations Directorate of ENA.

In the absence of an ENA Approvals Panel for voltage testing devices, this document is intended to provide collective guidance to Member Companies on general requirements and the approval process for voltage testing devices.

1 Scope

This document provides guidance on the procurement, approval, use, storage, transport and inspection of voltage testing devices including phasing out devices for use on distribution networks. Guidance is not included on the following items:

- Insulator-testing instruments;
- Voltage testing devices for the testing of pole top metalwork during live line work.

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.

Standards publications

BS EN 61243-1:2005+A1:2010, *Live working. Voltage detectors. Capacitive type to be used for voltages exceeding 1 kV a.c.*[1)]

BS EN 61243-2:1998, *Live working. Voltage detectors. Resistive type to be used for voltages of 1 kV to 36 kV a.c.*[2)]

BS EN 61243-3:2010, *Live working. Voltage detectors. Two-pole low-voltage type*[3)]

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1) Identical to IEC 61243-1:2003, incorporating amendment 1:2009

2) English language version of EN 61243-2:1997 including amendment A1:2000 and A2:2002

3) UK implementation of EN 61243-3:2010. Identical to IEC 61243-3:2009

BS EN 61243-5:2001, *Live working. Voltage detectors. Voltage detecting systems (VDS)*[4)]

Other publications

[N1] HSE GS38 (rev):1995. *Electrical test equipment for use by electricians*

3 Terms and definitions

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

3.1
voltage testing device (for live working)
device used to provide clear evidence of the presence or the absence of the operating voltage

NOTE: For example, voltage detectors can be described as capacitive type or resistive.

[adapted from IEC 60743, modified, and IEV 651-10-04, modified]

3.2
voltage detecting systems (VDS)
devices used to detect the presence or absence of operating voltage

NOTE: Where the design permits, any other electrical tests can be performed, for example phase comparison.

[BS EN 61243-5:2001]

3.3
two-pole voltage detector
voltage detector for bi-polar application, made of two probes, an indicator included or not in one of the probes and lead(s)

[BS EN 61243-3: 2010]

3.4
threshold voltage
minimum voltage between the live part and earth (ground) required to give a clear indication

NOTE: The threshold voltage declared by a manufacturer for a voltage testing device may be referenced to specific test conditions and so requirements for threshold voltage for field operation need to be related to the test conditions under which the voltage testing device was approved.

[BS EN 61243-1:2005+A1:2010]

3.5
interference field
superposed electric field which may affect the indication. It may result from the part to be tested or other adjacent parts, and may have any phase relationship

NOTE: The extreme cases for the tests are:

– an in-phase interference field exists when a small change of potential in the direction of the voltage detector axis results in an incorrect indication. This occurs as a result of the dimensions and/or configuration of the part of installation to be tested (or of adjacent parts of the installation having voltages in the same phase);

– an interference field in phase opposition exists when a strong change of potential in the direction of the voltage detector axis results in an incorrect indication. This occurs as a result of the adjacent parts of the installation having voltages in phase opposition.

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4) UK implementation of EN 61243-5:2001. Derived by CENELEC from IEC 61243-5:1997