

Modification proposal:	Distribution Code: DCRP/MP/17/06 Revision to Technical specification 41-24, 'Guidelines for the design, installation, testing and maintenance of main earthing systems in substations and Engineering Recommendation S34 'A guide for assessing the rise of earth potential at electrical installations'.		
Decision:	The Authority ¹ has decided to approve ² this modification		
Target audience:	Distribution licensees, Distribution Code Review Panel, distribution network users and other interested parties		
Date of publication:	22 October 2018	Implementation date:	08 November 2018

Background

These modifications propose to update and revise two technical standards, Technical Specification 41-24 ('TS 41-24') and Engineering Recommendation S34 ('EREC S34'), which are referenced in Annex 1 of the Distribution Code³ and therefore form part of Code. As a result, any modification to these technical standards are subject to Authority approval. TS 41-24 and EREC S34 are concerned with the earthing arrangements at substations.

TS 41-24 was first published in 1992 to provide guidelines for the design, installation, testing and maintenance of main earthing systems in substations. Following an incident in relation to operation of a pole-mounted equipment, an addendum to Section 15 covering earthing associated with high voltage ('HV') distribution overhead line networks (excluding tower lines and pole transformers) was issued in 2009. The requirements of Section 15 superseded any requirements in Sections 1 to 14 and the composite document contained a statement that Sections 1-14 would be updated in due course.

EREC S34 was first published in 1986 to provide a guide for assessing the rise of earth potential at substation sites. Other than two very minor amendments issued in 1986 and 1988, it has not been modified.

Since the two standards were first published, international, British and European standards have been published in the area of earthing of HV electrical installations, including substations. UK legislative changes have also increased the need for updated guidance in respect of the separation of HV and low voltage ('LV') substation earths. In addition, there have been considerable developments in the use of computer modelling of earthing systems as well as increased use of plastic-sheathed cables. As a result, a Distribution Code Working Group (the 'Working Group') was established to review and, if necessary, update both technical standards to account for these new technologies, changes in legislation and developments in standards. This review resulted in the Working Group proposing modifications to TS 41-24 and EREC S34.

¹ References to the "Authority", "Ofgem", "we" and "our" are used interchangeably in this document. The Authority refers to GEMA, the Gas and Electricity Markets Authority. The Office of Gas and Electricity Markets (Ofgem) supports GEMA in its day to day work. This decision is made by or on behalf of GEMA.

² This document is notice of the reasons for this decision as required by section 49A of the Electricity Act 1989.

³ <http://www.dcode.org.uk/annexes.html>

The modification proposals

The main proposed technical modifications to TS 41-24 include:

- Full alignment of requirements and terminology with BS EN 50522, including calculation of touch and step potentials.
- Provision of guidance on separation of substation HV and LV earths.
- Update of main substation earthing system design and maintenance requirements in accordance with BS EN 50522 and current best practice.
- Recognition of the increased use of plastic-sheathed cables.

The main proposed technical modifications to EREC S34 include:

- Full alignment of requirements and terminology with BS EN 50522, including a terminology lookup table.
- Full update of formulae from first principles.
- Replacement of nomograms with formulae.
- Provision of cable data for commonly used cables to facilitate calculations.

Approval of the proposed modifications would result in the creation of TS 41-24 Issue 2 and EREC S34 Issue 2.

Distribution Code Review Panel ('DCRP')⁴ comments and licensee recommendation

At the DCRP Panel meeting on 7 June 2018, the DCRP considered that the modification proposals would better facilitate all of the Distribution Code objectives and therefore recommended their approval. These modifications were also recommended for approval by the distribution network licensees.

A public consultation on the proposed modifications took place from 8 December 2017 to 26 January 2018. Two of the four respondents to the consultation considered that the proposals did not entirely better facilitate the Distribution Code objectives. The Working Group engaged with these respondents to identify and address their concerns, specifically that there is a need for further guidance on transferred potentials to third parties. The Working Group considered this issue to be outside the scope of the review of TS 41-24 and EREC S34, however it recommended that preparation of the desired guidance be added to the 2019 Energy Networks Association document work programme. The Working Group and the relevant respondents agreed that the work on the guidance should not delay the issue of revised documents TS 41-24 Issue 2 and EREC S34 Issue 2. We support this position.

Our decision

We have considered the issues raised by the modification proposals and those in the Final Modification Report (the 'FMR') dated 25 June 2018.⁵ In doing so, we have also considered and taken into account the responses to the consultation on the modification proposals undertaken by the Working Group, which are included in the FMR. We have concluded that:

⁴ The DCRP is established in accordance with SLC 21 of the Electricity Distribution Licence.

⁵ Distribution Code proposals, final reports and representations can be viewed at: <http://www.dcode.org.uk/areas-of-work/> and <http://www.dcode.org.uk/consultations/>

- implementation of the modification proposals will better facilitate the achievement of the applicable objectives of the Distribution Code;⁶ and
- approving the modification is consistent with our principal objective and statutory duties.⁷

Reasons for our decision

We consider this modification proposal will better facilitate Distribution Code objectives (a), (c) and (d), and has a neutral impact on (b).

(a) permit the development, maintenance, and operation of an efficient, co-ordinated, and economical system for the distribution of electricity

We are of the opinion that the modification proposals, through recognising developments in material technologies, provide greater flexibility with regard to the design of substation earthing systems and provide the required functionality at minimum cost, thereby better facilitating this objective.

(c) efficiently discharge the obligations imposed upon distribution licensees by the distribution licences and comply with the Regulation and any relevant legally binding decision of the European Commission and/or the Agency for the Co-operation of Energy Regulators

TS 41-24 and EREC S34 provide distribution licensees with a means of compliance with the Electricity Safety, Quality and Continuity Regulations (ESQCR) and other statutory health and safety requirements. It is our view that the modification proposals align requirements in TS 41-24 Issue 2 and EREC S34 Issue 2 with the latest national version of the European Standard EN 50522, BS EN 50522.

(d) promote efficiency in the implementation and administration of the Distribution Code

The modification proposals seek to update TS 41-24 and EREC S34 to bring them in line with current standards and legislation, thereby avoiding conflicts and ambiguities with those standards and legislation. In our view, this better facilitates the implementation and administration of the Distribution Code.

Decision notice

⁶ As set out in Standard Condition SLC 21.4 of the Electricity Distribution Licence available at: <https://epr.ofgem.gov.uk/Content/Documents/Electricity%20Distribution%20Consolidated%20Standard%20Licence%20Conditions%20-%20Current%20Version.pdf>

⁷ The Authority's statutory duties are wider than matters which the DCRP and distribution network licensees must take into consideration and are largely provided for in statute, in this case principally in the Electricity Act 1989.

In accordance with SLC 21.11 of the Electricity Distribution Licence, the Authority hereby directs that the modification to the Distribution Code proposed in the FMR to the Authority dated 25 June 2018 be made.

Peter Bingham
Chief Engineer

Signed on behalf of the Authority and authorised for that purpose