

Modification proposal:	Distribution Code: Engineering Recommendation G12/4 (Requirements for the application of protective multiple earthing to low voltage networks) – a review of Engineering Recommendation G12/3		
Decision:	The Authority directs that this proposal be made ¹		
Target audience:	Parties to the Distribution Code and other interested parties		
Date of publication:	17 January 2014	Implementation Date:	1 February 2014

Background to the change proposal

Electricity Distribution Licence holders² are required, by Standard Licence Condition ("SLC") 20 of their licences, to have in force, implement and comply with the Distribution Code. SLC 21 imposes, in effect, a duty on licence holders to review and, where appropriate, seek our³ approval for modification of the Distribution Code so as to better achieve the requirements of SLC 21. The Distribution Network Operators ("DNOs") may propose changes to the Distribution Code and initiate work on a review of the Code through the Distribution Code Review Panel ("DCRP").

The Energy Networks Association's ("ENA") Engineering Recommendation G12/3 ("ER G12/3") provides recommendations for the application of protective multiple earthing (PME^4) to low voltage networks. It also considers situations where PME should not normally be used. ER G12/3 is referred to in Annex 1 of the Distribution Code and is incorporated within the Distribution Code. Therefore, any change to this Engineering Recommendation constitutes a change to the Distribution Code and has to be approved by us. The current version, ER G12/3, came into effect in 1995.

The review of ER G12/3

A number of developments have led to DNOs identifying the need to review and update ER G12/3. These include: replacement of the Electricity Supply Regulations with the Electricity Safety, Quality and Continuity (ESQC) Regulations (2002); revision of the Institution of Engineering and Technology's (IET's) Wiring Regulations; and the development of new European standards. All of these industry standards address to some extent the earthing issues dealt with in ER G12/3.

In addition, since 2008, the lack of guidance in ER G12/3 in relation to the provision of low voltage supplies to traction (i.e. railways and tramways) installations has led to different interpretations in different parts of the country. The process to review all of

 $^{^{1}}$ This decision document includes the reasons for this decision as required by section 49A of the Electricity Act 1989.

 $^{^{\}rm 2}$ This includes the fourteen ex-PES licensees referred to as DNOs and all other licence holders referred to as IDNOs.

³ The terms 'the Authority', 'Ofgem' and 'we' are used interchangeably in this document. The Authority is the Gas and Electricity Markets Authority; the regulator of the gas and electricity industries in GB. Ofgem is the Office of the Gas and Electricity Markets which supports the Authority.

⁴ PME is a system where the neutral and protective earth conductor functions are combined in the supply system and earthed at the source and at multiple points on system.

these issues was initiated in 2009. An industry working group was established, with agreed terms of reference, reporting regularly to the DCRP.

The industry consultation process

The DCRP published a consultation document on the changes to the Distribution Code and ER G12/3 on its website in December 2012.⁵ Eight responses had been received when the consultation closed on 1 February 2013 (all responses were from non-network parties). The Health and Safety Executive (HSE) acted as a corresponding member of the working group and points raised by them were taken account of by the working group. Also, the ENA kept the JPEL/64⁶ Wiring Regulations (BS 7671) committee informed throughout the process. This included, in December 2012, the secretary of this committee circulating the DCRP public consultation announcement to all its members seeking responses. Once the consultation had closed, the working group met and reviewed all the responses. The working group made further changes to the documents to resolve the issues raised by respondents where they considered them to be appropriate. The working group has advised all stakeholders who responded to the consultation how their comments had been taken account of.

The modification proposal

The proposal seeks to replace ER G12/3 with ER G12/4 in Annex 1 of the Distribution Code. The proposed changes to ER G12/3 have been developed to:

- Include clearer guidance for providing low voltage PME supplies to Network Rail and other Traction Operators in order to achieve a more consistent approach.
- Take into account the requirements of European standards (EN 50122 series) being developed for railway fixed installations.
- Update the guidance on providing low voltage PME supplies in other special situations.
- Review and update the remaining technical content of the document, bearing in mind the updated IET wiring Regulations, the ESQC Regulations and the latest relevant International, European and National Standards.

The details of the changes proposed are set out in the consultation document published by the ENA on the Distribution Code website.⁷ In summary, the changes proposed are designed to meet the overall objectives set out above and also to deliver incremental improvements and clarifications in a number of areas of the Engineering Recommendation.

As a result of the proposed revision of ER G12/3, amendments are proposed to revise references to this Engineering Recommendation at Annex 1 and in the Distribution Planning and Connection Code sections (DPC4.3.2 and DPC4.4.2) of the Distribution Code.

DCRP recommendation

The DCRP considered this modification proposal at its meeting of 5 September 2013 and agreed unanimously to seek our approval to modify the Distribution Code so that, at Annex 1 of the Distribution Code, ER G12/3 is replaced by ER G12/4 and changes are made at DPC4.3.2 and DPC4.4.2. The changes proposed by the DNOs are set out in the

⁵Go to <u>http://www.dcode.org.uk/consultations/</u> and then select the G12 consultation.

⁶ Under the direction of the British Electrotechnical Committee, the Standards Policy and Strategy Committee, and the IET, the BSI's JPEL/64 committee is responsible for the UK input to IEC/TC 64 and CLC/TC 64 and the National implementation of the standards produced as BS 7671 - Wiring Regulations.

⁷ Go to <u>http://www.dcode.org.uk/consultations/</u> and then select the G12 consultation.

report first sent to us by the Secretary of the DCRP on 11 September 2013 ("the September report") and in the updated report sent to us on 6 December 2013 (see below).

The report recommends the introduction of ER G12/4 as the DCRP considers that it will provide clearer guidance on the application of PME which in turn will assist the safe and efficient provision of low voltage supplies by DNOs in accordance with the latest regulations. It is expected to assist Users (or their representatives) in their correct use of PME and clarify the division of responsibilities between Users and the Network Operator. It is expected to benefit electric traction system operators and bring clarity and flexibility to the provision of PME supplies to metal-clad street furniture.

The report stated that the proposals had been generally welcomed. It was noted that stakeholders had not identified any issues that suggest any material detriment to any User or prospective User. The report also stated that the introduction of G12/4 supported the Applicable Objectives (a) and (b) of the Distribution Code.⁸

Our consideration of the report to the Authority

We are aware of the extent of the work carried out to review G12/3 and of the steps taken, including consultation, to involve stakeholders in the process. We note that the members of the working group were primarily from the licensed distribution network companies. However, Network Rail was also represented.

We were assisted by external experts in carrying out a review of the September report. This review⁹ concluded that ER G12/4 does better meet the Applicable Objectives of the Distribution Code. However, it did also identify a small number of issues that it recommended should be reconsidered by the working group. These related to a number of detailed technical issues. They are summarised in Annex 1 to this letter.

The working group considered all of the points raised and has made changes to ER G12/4 to address them. We have taken the view that these changes are relatively minor so that further consultation would not be proportionate.

Having completed this review process, the Report to the Authority was resubmitted to us for approval on 6 December 2013.

The Authority's decision

SLC 21.10 of the Electricity Distribution Licence provides that modifications to the Distribution Code that are proposed by the licensees and sent to us cannot be implemented without our approval.

We have considered the report sent to us on 11 September 2013 and the comments received during the consultation process. We have also considered the results of the review carried out by our external experts and the revised report sent to us on 6 December 2013. We have concluded that, based on the version of G12/4 that was sent to us on 6 December 2013:

1. implementation of the modification proposal will better facilitate compliance with the Applicable Objectives of the Distribution Code; and

⁸ The Applicable Objectives of the Distribution Code are set out in SLC 21.4 of the Electricity Distribution Licence.

⁹ The review document can be found on our website: <u>https://www.ofgem.gov.uk/publications-and-updates/consultancy-support-evaluation-engineering-recommendation-g124</u>

2. directing that the modification is made is consistent with our principal objective and statutory duties.¹⁰

Reasons for our decision

We set out below our views on which of the Applicable Distribution Code objectives are better facilitated by the modification.

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

Discussions at the DCRP and elsewhere demonstrated a clear need to review ER G12/3 and we supported the DCRP's decision to carry out this review. As stated above, we have observed the process that the DCRP and the working group have followed in carrying out this review, in particular the steps taken to engage stakeholders in the process. We note that the HSE has been informed of the review process and has engaged with it. We also welcome the engagement with the BSI's JPEL/64 committee.

While the industry consultation process highlighted some issues, the proposal was generally welcomed by stakeholders. Where parties proposed changes, these were considered by the working group before deciding whether or not to include them. All parties have been advised of the actions taken.

SLC 21.2 of the Licence requires the Distribution Code, amongst other things, to set out all material technical aspects relating to connections to, and the operation and use of, the licensee's Distribution System through a Planning and Connection Code. We support the DCRP's decision to update ER G12/3 and consider that ER G12/4 (as provided to us on 6 December 2013) better meets this requirement. It does so by updating the guidance on a number of technical issues as described earlier in this letter.

We therefore consider that applicable objective (a) is better met by the modification proposal by updating and clarifying the requirements for the application of PME for low voltage networks. We consider that the proposal has a neutral impact in relation to applicable objectives (b) and (c).

We also note that the report states that the introduction of ER G12/4 will have no adverse environmental impacts and we agree with this view.

Decision notice

In accordance with SLC 21.11 of the Electricity Distribution Licence, the Authority hereby directs that the modifications to the Distribution Code set out in the Report to the Authority of 6 December 2013 be made.

Paul Branston

Associate Partner

Signed on behalf of the Authority and authorised for that purpose

¹⁰ The Authority's statutory duties are wider than matters which the Panel and licensees must take into consideration and are largely provided for in statute, principally in this case the Electricity Act 1989 (as amended most recently by the Energy Act 2010), as well as arising from directly effective European Union law.

Annex 1

Ofgem's proposed changes to the version of ER G12/4 submitted to the Authority on 13 September 2013

The working group considered all of the points raised below and has made changes to ER G12/4 to address them.

Protective Neutral Bonding

It is suggested that, in order to avoid misunderstandings, section 4.11 should include the following restrictions:

- Maximum number of customers' installations; and
- Distance between the common connection point of the customers' installations and the supply substation.

SNE Installations

There is a concern that, by giving a fixed maximum earth electrode resistance value of 20 Ohm, this is taken as the default value and the rise of potential is not calculated and proved to be safe. It is not clear that 20 ohm value is an appropriate default value. It is therefore suggested that it may be appropriate to leave the wording to: 'sufficient to limit the rise of potential under open circuit neutral conditions' rather than suggest a value.

Swimming Pools

There is concern about conflict with BS 7671 which deals very thoroughly with this issue. Suggest that the appropriate section of 7671 is referenced here rather than summarised.

Additional recommendations

- Labelling of PME supplies.
- A correction/clarification in Fig 4.4.
- The reintroduction of the option for a TN-S earthing supply at a construction site via an earthing transformer.