

THE DISTRIBUTION CODE

OF LICENSED DISTRIBUTION NETWORK OPERATORS OF GREAT BRITAIN

Issue ~~36-3X~~ – 10 December 2018 TBA

GUIDANCE NOTE 2/5

First issued 03 March 2011 – updated 06 October 2011

Second Issue 29 March 2012

Third Issue December 2012.

Fourth Issue September 2013

Fifth Issue May 2018 – updated TBA

ENGINEERING RECOMMENDATIONS G83 AND G59

This guidance note was originally issued on 03 March 2011 and its main provision was to allow the use small scale generation of capacity greater than 16A per phase, provided it had been type tested to the requirements of G83/1-1 but with a modified over frequency protection setting.

The guidance note only applies to small scale generation first connected before 27 April 2019. When the requirements of the EU Network Code “Requirements for all generators” comes into effect on 27 April 2019 it will be necessary for all small scale generation connected on or after that date to comply with the requirements of EREC G98 or EREC G99 as appropriate.

Previous updates to this note changed the applicable dates to allow a period of grace following the introduction of revised versions of G59 and G83 in which manufacturers can adapt their equipment to the changed requirements of these documents.

For G83/2 and G59/3 the Distribution Code Review Panel wishes to see the following continuing interpretation:

- For all small scale embedded **Power Generating Modules** of up to and including 16A per phase (provided that the aggregate capacity of installed generation is less than or equal to 16A per phase), until 1 March 2014 it is permissible to connect to the general requirements of previous versions of G83 provided this is through an inverter or controller with a protection/control system that has either been fully type tested in accordance with G83/1-1, G83/2 or in accordance with G59/2. After 1 March 2014 it will only be allowable to connect small scale embedded generation of up to and including 16A per phase that complies with G83/2 (or with G59/3-1 for small scale embedded **Power Generating Modules** non-compliant with G83/2). From 1 July 2018 it will only be allowable to connect small scale embedded generation of up to and including 16A per phase that complies with G83/2-1 (or with G59/3-4 (or subsequent version thereof) for small scale embedded generation sets non-compliant with G83/2-1). Note that from 27 April 2019 it will only be possible to connect in accordance with EREC G98 (or EREC G99 for small scale embedded **Power Generating Modules** not compliant with EREC G98).
- Connection of small scale embedded generation of above 16A per phase (including the connection of small scale embedded generation of less than 16A per phase where the aggregate capacity of installed generation is greater than 16A per phase) made before 1 December 2014 can be in accordance with either G59/2-1 or G59/3-2. Such connections made after 1 December 2014 must be made in accordance with G59/3-2, ~~G59/3-3 or G59/3-4~~

| (subsequent version thereof) as appropriate to the commissioning date. Note that from 27 April 2019 it will only be possible to connect in accordance with EREC G99.

ANNEX 1 - QUALIFYING STANDARDS

This Annex forms part of the **Distribution Code** technical requirements.

Distribution Code Requirements Implemented via Electricity Supply Standards

Copies of the following Engineering Recommendations and Technical Specifications are freely available from the **Distribution Code** website at <http://www.dcode.org.uk/> or from Energy Networks Association, 4 More London Riverside, London SE1 2AU,

<http://www.energynetworks.org/>. A copy of Engineering Memorandum PO-PS-037 is available from Scottish Hydro Electric Power Distribution Ltd on request.

- 1 **Engineering Recommendation G5/4-1**
Planning levels for harmonic voltage distortion and the connection of non-linear equipment to transmission and distribution systems in the United Kingdom.
- 2 **Engineering Recommendation G12/4-1**
Requirements for the application of protective multiple earthing to low voltage networks.
- 3 **Engineering Recommendation G59/3-~~54~~**
Recommendation for the connection of generating plant to the distribution systems of licensed distribution network operators
- 4 (a) **Engineering Recommendation P2/6**
Security of Supply.
 (b) **EM PO-PS-037**
Distribution planning standards of voltage and of security of supply. (Parts of Scottish Hydro Electric Power Distribution Ltd Area)
- 5 **Engineering Recommendation P24**
AC traction supplies to British Rail.
- 6 **Engineering Recommendation P25**
The short-circuit characteristics of single-phase and three-phase low voltage distribution networks
- 7 **Engineering Recommendation P28**
Planning limits for voltage fluctuations caused by industrial, commercial and domestic equipment in the United Kingdom.
- 8 **Engineering Recommendation P29**
Planning limits for voltage unbalance in the United Kingdom for 132kV and below.
- 9 **Technical Specification 41-24 Issue 2**
Guidance for the design, installation, testing and maintenance of main earthing systems in substations
- 10 **Engineering Recommendation S34 Issue 2**
A guide for assessing the rise of earth potential at electrical installations.

DISTRIBUTION PLANNING AND CONNECTION CODE (DPC)

DISTRIBUTION PLANNING AND CONNECTION CODE 7

DPC7 REQUIREMENTS FOR EMBEDDED GENERATORS

DPC7.1 Introduction

DPC7.1.1 In addition to meeting the requirements of this **Distribution Planning and Connection Code DPC7, Embedded Generators** will need to meet the requirements of other relevant sections of the **Distribution Code**. This applies to **Power Generating Modules** that connected both prior to and after 27 April 2019.

DPC7.1.2 DPC7 is applicable to all **Embedded Generators** including a **Customer With Own Generation and Other Authorised Distributors**, having **Power Generating Modules** operating or capable of operating in parallel with the **DNO's Distribution System** that were commissioned on the **DNO's Distribution System** prior to 27 April 2019.

DPC7.1.3 In addition **Power Generating Module(s)** in construction belonging to **Generators** who had concluded a final and binding contract for the purchase of main generating plant before 17 May 2018 need to comply with the rest of DPC7; they do not need to comply with Engineering Recommendation G99. The **Generator** must notify the **DNO** of the conclusion of this final and binding contract by 17 November 2018.

DPC7.1.4 **Power Generating Modules** commissioned on or after 27 April 2019, or which have been substantially modified after that date, must meet the requirements of Engineering Recommendation G98 or Engineering Recommendation G99 as applicable. Such **Power Generating Modules** do not need to comply with the requirements of the rest of DPC7.

DPC7.1.5 27 April 2019 is the date from which new or substantially modified **Power Generating Modules** must comply with the European Network Code on Requirements for Connection of Generators. Compliance with Engineering Recommendations G98 and G99 will ensure compliance with this European Network Code.

DPC7.2 General Requirements

DPC7.2.1 **Embedded Generators** commissioned prior to 27 April 2019 shall comply with the requirements of Item 3, DGD Annex 1 Engineering Recommendation G59/3-4, "Recommendation for the connection of generating plant to the distribution systems of licensed distribution network operators" [\(or subsequent version thereof\)](#).

DPC7.2.2 Every installation or network which includes a **Power Generating Module** operating in parallel with the **DNO's Distribution System** must include an **Isolating Device** capable of disconnecting the whole of the infeed from the **DNO's Distribution System**. This **Isolating Device** will normally be owned by the **Generator**, but may by agreement be owned by the **DNO**.

DPC7.2.3 The **Generator** must grant the **DNO** rights of access to the **Isolating Device** without undue delay and the **DNO** must have the right to isolate the **Generator's** infeed at any time should such disconnection become necessary for safety reasons and in order to comply with statutory obligations. The **Isolating Device** should normally be installed at the **Connection Point**, but may be positioned elsewhere with the **DNO's** agreement.

DISTRIBUTION PLANNING AND CONNECTION CODE (DPC)

DPC7.4.7 Frequency Sensitive Relays

It is conceivable that a part of the **DNO's Distribution System**, to which **Embedded Generators** are connected can, during emergency conditions, become detached from the rest of the **System**. It will be necessary for the **DNO** to decide, dependent on local network conditions, if it is desirable for the **Embedded Generators** to continue to generate onto the islanded **DNO's Distribution System**.

If no facilities exist for the subsequent resynchronisation with the rest of the **DNO's Distribution System** then the **Embedded Generator** will under **DNO** instruction, ensure that the **Power Generating Module** and/or **Embedded Transmission System** is disconnected for re-synchronisation.

DPC7.4.8 Black Start Capability

The **National Electricity Transmission System** will be equipped with **Black Start Stations** (in accordance with the **Distribution Operating Code** DOC 9). It will be necessary for each **Embedded Generator** to notify the **DNO** if its **Power Generating Module** has a restart capability without connection to an external power supply, unless the **Embedded Generator** shall have previously notified **NGC** accordingly under the **Grid Code**. Such generation may be registered by **NGC** as a **Black Start Station**.

DPC7.4.9 Commissioning Tests

DPC7.4.9.1 Where **Power Generating Module** or an **Embedded Transmission System** requires connection to the **DNO's Distribution System** in advance of the commissioning date, for the purposes of testing, the **Embedded Generator** must comply with the requirements of the **Connection Agreement**. The **Embedded Generator** shall provide the **DNO** with a commissioning programme, approved by the **DNO** if reasonable in the circumstances, to allow commissioning tests to be co-ordinated.

DPC7.4.9.2 The **Generator** will demonstrate all the commissioning tests performed on his **Power Generating Module** in order to discharge the requirements of the **Distribution Code** and Annex 1, item 3 (ER G59/~~3-4~~). In general the **DNO** will witness these tests for **Power Generating Modules** connected to the **DNO's Distribution System** at **HV**. For **Power Generating Modules** connected to the **DNO's Distribution System** at **Low Voltage** it is expected that the **DNO** will not witness the commissioning tests in the majority of cases.

DPC7.5 Technical Requirements for Medium Power Stations

DPC7.5.1 Where a **Generator** in respect of an **Embedded Power Station** is a party to the **CUSC** this DPC 7.5 will not apply.

DPC7.5.2 In addition to the requirements in DPC7.4, the **DNO** has an obligation under CC 3.3 of the **Grid Code** to ensure that all relevant **Grid Code** Connection Condition requirements are met by **Medium Power Stations**. These requirements are summarised in CC 3.4 of the **Grid Code**. It is incumbent on **Medium Power Stations** to comply with the relevant **Grid Code** requirements listed in CC3.4 of the **Grid Code** as part of compliance with this **Distribution Code**. Note that a **DC Converter** installation of capacity greater than 50MW and less than 100MW is considered to be a **Medium Power Station** for the purposes of **Grid Code** compliance in this **Distribution Code**.

29	01/02/18	Modification to DPC7.4.3.4 and DPC7.4.3.7 to change RoCoF compliance requirements, and prohibit the future use of vector shift as LoM protection. Replace reference to ER G59/3-2 with ER G59/3-3
30	01/03/18	To take cognisance of the revision to EREC P25 (amalgamation of ER P25 and ERP26). Modification to Annex 1 list and DPC4.3.2, DPC4.4.1 and DPC6.5.1. Remove reference to ER P26.
31	16/05/18	Definition of Small, Medium and Large Power Stations altered to incorporate introduction of the European Network Code Requirements for Generators. Modification to DPC 7 to allow for compliance with the European Network Code Requirements for Generators achieved by the introduction of Engineering Recommendations G98 and G99. Removal of G59 duplicate clauses: <ul style="list-style-type: none"> • DPC7.1.4 and DPC7.1.5 Parallel operation • DPC7.2.2 and DPC7.2.4 Isolation and safety labelling • DPC7.2.5 Disconnection • DPC7.2.6 Operational & Safety • DPC7.2.8 Synchronising • DPC7.4.1.3 Frequency Operating Range • DPC7.4.3.4, DPC7.4.3.5 and DPC7.4.3.6, DPC7.4.3.9 Protection DOC 5 clarification around Medium Power Stations.
32	01/07/18	Update of G59/3-3 to G59/3-4, and G83/2 to G83/2-1 throughout. Minor update to Guidance Note to reflect this change.
33	23/07/18	Correction of compliance date for G98 and G99 from 17 May 2019 to 27 April 2019; update of references to G98 and G99 for the housekeeping mods to those two documents.
34	10/09/18	New DPC9 (and associated definitions) added to implement the Demand Connexion Code.
35	08/11/18	Update to Annex 1 to include new references to EREC S34 Issue 2 and TS 41-24 Issue 2.
36	10/12/18	Updated to include new references to EREC G98 Issue 1 Amendment 2 and to EREC G99 Issue 1 Amendment 3.
<u>TBA</u>	<u>TBA</u>	<u>Update reference to EREC G59/3-5 in Annex 1 and consequential amendments in GN2, DPC7.2.1, DPC7.4.9.2.</u>

END