ANNEX 2

THE DISTRIBUTION CODE

OF LICENSED DISTRIBUTION NETWORK OPERATORS OF GREAT BRITAIN

Issue 29 – 01 Feb 2018

THE DISTRIBUTION CODE OF GREAT BRITAIN

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The following items do not form part of the approved Distribution Code and are for information only:

- Guidance Notes 1 to 3
- The Introduction to the Distribution Code, ie DIN1 to DIN 7

GUIDANCE NOTE 1

(Dated 01.04.1993 England and Wales Distribution Code

Adopted for the Distribution Code of Great Britain)

ENGINEERING RECOMMENDATION P2/6

The **Distribution Code Review Panel** has reviewed Engineering Recommendation P2/6 and for **Customers** falling within the remit of the **Distribution Code** has agreed that:-

The main section of this document deals with the establishment of recommendations for the security of electricity transmission and distribution systems of network operators. It does not apply to the supply connection of a **Customer**.

Each **Customer** supply connection needs to be considered on its own merits by discussion between the **Customer** and the network operator. The costs of providing a **Customer** supply connection by the network operator will be partly dependent upon the nature of the network operator's electrical system and the location of the **Customer's** premises. It will be for the **Customer** to decide, in negotiations with the network operator, the level of security required for the electricity supply to be provided to the **Customer's** premises. In general, the greater the level of security of supply required by the **Customer**, the greater the capital investment required by the network operator, as a consequence this will require the **Customer** to meet a higher level of supply connection charge.

GUIDANCE NOTE 2/4

First issued 03 March 2011 – updated 06 October 2011

Second Issue 29 March 2012

Third Issue December 2012.

Fourth Issue September 2013

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.

It has been updated on the dates above 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.

Now that G83/2 and G59/3 have been published the Distribution Code Review Panel wishes to see the following continuing interpretation:

- For all small scale embedded generation sets 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 G59/3-1for small scale embedded generation sets non-compliant with G83/2).

- 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.

GUIDANCE NOTE 3

First issued 1 December 2012

ENGINEERING RECOMMENDATIONS G83

The Panel is aware that small scale generation using the Stirling engine as a prime mover has been designed using resonance to operate within ±1% of the nominal frequency of 50Hz. Accordingly it is not technically possible for generation using this technology currently to remain connected down to 47.0 Hz as required by G83/2.

Recognizing the limitations of the current technology, and noting that currently the adoption of this technology is niche and far from mass market, the Panel believes that those G83/2 tests relating to behaviour at frequencies out side of the ±1% range should be waived or modified, thus allowing this technology to continue its niche use.

In the longer term the Panel expects that either the requirements of the EU Network Code "Requirements for all Generators" when enacted in UK law will require Stirling engine designs to be modified to comply, or to seek a specific derogation. Similarly if the growth of this technology showed a risk of being material, then again full compliance with G83 would be required. The Panel believes that a sensible threshold of materiality, considering the technical and commercial effects of the technology, to be 50MW.

This note applied from 1 December 2012 and applied in force until 31 December 2016.

This DCRP derogation has now expired and it is now expected that the "Stirling Engine" as an emerging technology must now comply with the requirements laid down in Articles 66-70 of the EU Network Code Requirements for all Generators.

DISTRIBUTION GLOSSARY AND DEFINITIONS (DGD)

DISTRIBUTION GLOSSARY AND DEFINITIONS (DGD)

DGD 1. EXPRESSIONS

In this **Distribution Code** the following words and expressions shall, unless the subject matter or context otherwise requires or is inconsistent therewith, bear the listed meanings:-

Act	The Electricity Act 1989 (as amended by the Utilities Act 2000 and the Energy Act 2004).
Active Power	The product of voltage and the in-phase component of alternating current measured in units of watts, normally measured in kilowatts (kW) or megawatts (MW).
Annex 1 Standard	A electricity industry national standard that implements **Distribution Code r**equirements and which is listed in Annex 1 of the **Distribution Code,** and forms part of the **Distribution Code**.
Annex 2 Standard	A electricity industry national standard that has a material effect on **Users** but does not implement any **Distribution Code** requirements and does not form part of the **Distribution Code** technical requirements.
Annual Average Cold Spell (ACS) Conditions	A particular combination of weather elements that give rise to a level of **Peak Demand** within a financial year which has a 50% chance of being exceeded as a result of weather variation alone.
Apparatus	All **Equipment** in which electrical conductors are used, supported or of which they may form a part.
Authorised Electricity Operator or AEO	Any person (other than the **DNO** in its capacity as an operator of a Distribution System) who is authorised to generate, participate in the transmission of, distribute or supply electricity.
Authority	The Gas and Electricity Markets Authority established under Section 1 of the Utilities Act 2000.
Average Conditions	That combination of weather elements within a period of timewhich is the average of the observed values of these weather elements during equivalent periods over many years (Sometimes referred to as normal weather).
Balancing and Settlement Code (BSC)	The code of that title as from time to time amended.
Balancing Mechanism	Has the meaning set out in **NGC's Transmission Licence**.

DISTRIBUTION GLOSSARY AND DEFINITIONS (DGD)

BM Unit	Has the meaning set out in the **BSC**, except that for the purposes of the **Distribution Code** the reference to "Party" in the **BSC** shall be a reference to a **User**.
BM Participant	A person who is responsible for and controls one or more **BM Units** or where a **CUSC Bilateral Agreement** specifies that a **User** is required to be treated as a **BM Participant** for the purpose of the **Grid Code.** For the avoidance of doubt, it does not imply that they must be active in the **Balancing Mechanism**.
Black Start	The procedure necessary for a recovery from a **Total Shutdown** or **Partial Shutdown.**
Black Start Station	A **Power Station** which is registered pursuant to a **CUSC Bilateral Agreement** with **NGC**, as having a Black Start Capability.
CENELEC	European Committee for Electrotechnical Standardisation.
Citizens Advice (CA)	National Association of Citizens Advice Bureaux
Citizens Advice Scotland (CAS)	Scottish Associatin of Citizens Advice Bureaux
Civil Emergency Direction	Directions given by the **Secretary of State** to **AEOs** for the purpose of mitigating the effects of any natural disaster or other emergency which, in the opinion of the **Secretary of State**, is or may be likely to disrupt electricity supplies.
Committed Project Planning Data	Data relating to a **User Development** once the offer for a **Connection Agreement** is accepted.
Connection Agreement	An agreement between the **DNO** and the **User** or any **Customer** setting out the terms relating to a connection with the **DNO's Distribution System** (excluding any **CUSC Bilateral Agreement**).
Connection Point	An **Entry Point** or an **Exit Point** of the **Distribution System** as the case may be**.**
Control Centre	A location used for the purpose of control and operation of all, or of part of a **Distribution System**, **National Electricity Transmission System** or the **System** of a **User.**
Control Person	A person who has been nominated by an appropriate officer of the **DNO, Transmission Licensee** or a **User** to be responsible for controlling and co-ordinating safety activities necessary to achieve **Safety From The System.**
Control Phase	The period 0-24 hours inclusive ahead of real time operation. The **Control Phase** follows on from the **Programming Phase** and covers the period down to real time.
CUSC	Has the meaning set out in **NGC's Transmission Licence**

DISTRIBUTION GLOSSARY AND DEFINITIONS (DGD)

CUSC Bilateral Agreement	An agreement pursuant to the **CUSC Framework Agreement** made between **NGC** and a **User** of the **National Electricity Transmission System**
CUSC Disputes Resolution Procedure	The procedure described in **CUSC** relating to disputes resolution.
CUSC Framework Agreement	Has the meaning set out in **NGC's Transmission Licence.**
Customer	Any person supplied or entitled to be supplied with electricity at any premises within **Great Britain** but shall not include any **Authorised Electricity Operator** in its capacity as such.
Customer With Own Generation or CWOG	A **Customer** with one or more **Generation Sets** connected to the **Customer's System**, providing all or part of the **Customer's** electricity requirements**,** and which may use the **DNO's Distribution System** for the transport of any surplus of electricity being exported.
DC Converter	Any **Apparatus** used to convert alternating current electricity to direct current electricity, or vice versa. A **DC Converter** is a standalone operative configuration at a single site comprising one or more converter bridges, together with one or more converter transformers, converter control equipment, essential protective and switching devices and auxiliaries, if any, used for conversion. In a bipolar arrangement, a **DC Converter** represents the bipolar configuration.
DNO's Distribution System	The **System** consisting (wholly or mainly) of electric lines owned or operated by the **DNO** and used for the distribution of electricity between the **Grid Supply Points** or **Generation Sets** or other **Entry Points** to the points of delivery to **Customer**s or **Authorised Electricity Operators**, or any **Transmission Licensee** within **Great Britain** and **Offshore** in its capacity as operator of the licensee's **Transmission System** or the **National Electricity Transmission System** and includes any **Remote Transmission Assets** (owned by a **Transmission Licensee** within **Great Britain**), operated by the **DNO** and any electrical plant and meters and metering equipment owned or operated by the **DNO** in connection with the distribution of electricity, but shall not include any part of the **National Electricity Transmission System**
Decimal Week	The week numbering system where week 1 commences in the first week of January on a date as advised by the **DNO**.
Demand	The demand of MW or MVAr of electricity (ie both **Active Power** and **Reactive Power** respectively) unless otherwise stated.

Demand Control	Any or all of the following methods of achieving a **Demand** reduction: (a) **Customer** voltage reduction initiated by the **DNO** (other than following an instruction from **NGC**); (b) **Customer Demand** reduction by disconnection initiated by the **DNO** (other than following an instruction from **NGC**); (c) **Demand** reduction instructed by **NGC**; (d) automatic low frequency **Demand** disconnection; (e) emergency manual **Demand** disconnection
Demand Control Notification Level	The level above which the **DNO** has to notify **NGC** of its proposed or achieved use of **Demand Control** which is 12 MW in England and Wales and 5 MW in Scotland.
Detailed Planning Data (DPD)	Detailed additional data which the **DNO** requires under the **Distribution Planning and Connection Code** in support of **Standard Planning Data.**
Distribution Business	The authorised business of the **DNO** or any affiliate or related undertaking of the **DNO** (whether the business is undertaken by the **DNO** or another licence holder), comprising: (a) the distribution of electricity through the **DNO's Distribution System**, including any business in providing connections to such **System**; and (b) the provision of Distributor Metering and Data Services as defined in the **Distribution Licence**.
Distribution Code	A code required to be prepared by a **DNO** pursuant to condition 9 (**Distribution Code**) of a **Distribution Licence** and approved by the **Authority** as revised from time to time with the approval of, or by the direction of, the **Authority**.
Distribution Code Review Panel or Panel	The standing body established under the **Distribution General Conditions.**
Distribution Data Registration Code	That portion of the **Distribution Code** which is identified as the **Distribution Data Registration Code.**
Distribution General Conditions or DGC	That portion of the **Distribution Code** which is identified as the **Distribution General Conditions.**
Distribution Glossary and Definitions	That portion of the **Distribution Code** which is identified as the **Distribution Glossary and Definitions.**
Distribution Introduction (DIN)	That portion of the **Distribution Code** which is identified as the **Distribution Introduction**.
Distribution Licence	A distribution licence granted under Section 6(1)(c) of the **Act**.
Distribution Network Operator (DNO)	The person or legal entity named in Part 1 of the **Distribution Licence** and any permitted legal assigns or successors in title of the named party.

Distribution Operating Code (DOC)	That portion of the **Distribution Code** which is identified as the **Distribution Operating Code.**
Distribution Planning and Connection Code (DPC)	That portion of the **Distribution Code** which is identified as the **Distribution Planning and Connection Code.**
Distribution System	The electrical network operated by an **Other Authorised Distributor.**
Distribution Use of System Agreement	The standard form of agreement of that name, as amended from time to time.
Earthing Device	A means of providing a connection between an **Isolated** conductor and earth.
Electricity Safety, Quality and Continuity Regulations (ESQCR)	The statutory instrument entitled The Electricity Safety, Quality and Continuity Regulations 2002 as amended from time to time and including any further statutory instruments issued under the **Act** in relation to the distribution of electricity.
Embedded	Having a direct electrical connection to a **Distribution System.**
Embedded Generator	A **Generator** including a **Customer With Own Generation** whose **Generation Sets** are directly connected to the **DNO's Distribution System** or to an **Other Authorised Distributor** connected to the **DNO's Distribution System.** The definition of **Embedded Generator** also includes the **OTSO** in relation to any **Embedded Transmission System**
Embedded Transmisison Licensee	**Offshore Transmission Licensee** for an **Embedded Transmission System**
Embedded Transmission System	An **Offshore Transmission System** directly connected to the **DNO's Distribution System** or to an **Other Authorised Distributor** connected to the **DNO's Distribution System.**
Entry Point	The point at which an **Embedded Generator** or other **Users** connect to the **DNO's Distribution System** where power flows into the **DNO's Distribution System** under normal circumstances**.**
Equipment	**Plant** and/or **Apparatus.**
Electricity Supply Industry (ESI)	Electricity Supply Industry.
Event	An unscheduled or unplanned (although it may be anticipated) occurrence on or relating to a **System** including, without limiting that general description, faults, incidents and breakdowns and adverse weather conditions being experienced. It includes an occurrence where the compliance of **Customer's Equipment** with this **Distribution Code** or where relavant the **Grid Code** is or might be compromised.

Existing Offshore Generators	A **Generator** with a **Power Station** located in offshore waters that has an agreement for connection to the **DNO's Distribution System** via lines of 132kV or above that are wholly or partly in offshore waters.
Exit Point	The point of supply from the **DNO's Distribution System** to a **User** where power flows out from the **DNO's Distribution System** under normal circumstances**.**
External Interconnection	A connection to a party outside the **Total System.**
Fault Level	Prospective current that would flow into a short circuit at a stated point in the **System** and which may be expressed in kA or, if referred to a particular voltage, in MVA.
Feasibility Project Planning Data	Data relating to a proposed **User Development** until such time that the **User** applies for a **Connection Agreement**.
Frequency	The number of alternating current cycles per second (expressed in Hertz) at which a **System** is running.
Fuel Security Code	The document of that title designated as such by the **Secretary of State**, as from time to time amended.
Generating Plant	A **Power Station** including any **Generation Set** therein.
Generating Plant Output	That portion of the output of **Generating Plant** which is contributing to meeting **Demand.**
Generation Set	Any **Apparatus** which produces electricity.
Generator	A person who generates electricity under licence or exemption under the **Act.** A person who has connected a **Generation Set(s)** in accordance with Item 13 DGD Engineering Recommendation G83/2 ("Recommendations For The Connection of Type Tested Small-Scale Embedded Generators (Up To 16 A Per Phase) in Parallel With Public Low-Voltage Distribution Networks") and where this is (are) their only **Generation Set(s)**, is not classed as a **Generator** for the purpose of this **Distribution Code.**
Great Britain or GB	"The landmass of England & Wales and Scotland, including internal waters".
Grid Code	The code which **NGC** is required to prepare under its **Transmission Licence** and have approved by the **Authority** as from time to time revised with the approval of, or by the direction of, the **Authority**.
Grid Supply Point	Any point at which electricity is delivered from the **National Electricity Transmission System** to the **DNO's Distribution System.**
High Voltage (HV)	A voltage exceeding 1000 Volts**.**

High Voltage Customer	A **Customer** connected to a part of the **Distribution System** which is operating at **HV**.
Implementing Control Person	Pursuant to DOC8, the person implementing **Safety Precautions** at an Operational Boundary.
Individual DNO Standard	A standard adopted by an individual **DNO** and which is published as such by an individual **DNO** and that has a material effect on **Users.**
IEC	International Electrotechnical Commission.
Independent Distribution Network Operator	A **DNO** that does not have a Distribution Services Obligation Area in its **Distribution Licence** and is not an ex Public Electricity Supplier
Industry Codes Technical Group (ITCG)	A a standing body comprised of representatives of all the **DNO**s to carry out the functions referred to in its own Constitution and Rules
Isolated	Disconnected from associated **Plant** and **Apparatus** by an **Isolating Device(s)** in the isolating position or by adequate physical separation or sufficient gap.
Isolating Device	A device for rendering **Plant** and **Apparatus Isolated.**
Joint System Incident	Is an **Event** occurring on the **System** or installation, which, in the opinion of the **DNO**, has or may have a serious and/or widespread effect on the **System** or installation of another.
Large Power Station	A **Power Station** which is connected to a **System** notionally connected to a **Grid Supply Point** in; a. **NGC's** Transmission Area with a **Registered Capacity** of 100 MW or more; b. SP Transmission Limited's Transmission Area with a **Registered Capacity** of 30MW or more; c. Scottish Hydro-Electric Transmission Limited's Transmission Area with a **Registered Capacity** of 10MW or more.
Limited Frequency Sensitive Mode	A mode whereby the operation of a **Generation Set** is **Frequency** insensitive except when the **System Frequency** exceeds 50.4Hz, from which point **Limited High Frequency Response** must be provided.
Limited High Frequency Response	A response of a **Generation Set** to an increase in **System Frequency** above 50.4Hz leading to a reduction in **Active Power** in accordance with the provisions of **Grid Code** BC3.7.2.
Load Managed Area	Has the meaning given to that term in the **Distribution Use of System Agreement**.

Low Voltage or LV	In relation to alternating current, a voltage exceeding 50 volts but not exceeding 1 000 volts**.**
Maximum Generation	The additional output obtainable from **Generating Plant** in excess of **Registered Capacity.**
Medium Power Station	A **Power Station** which is connected to a **System** notionally connected to a **Grid Supply Point** in **NGC**'s Transmission Area with a **Registered Capacity** of 50 MW or more but less than 100 MW. For the avoidance of doubt an installation comprising one or more **DC Converters** with an aggregate capacity of between 50 and 100MW will be classed as a Medium Power Station for the purposes of this Distribution Code.
Meter Operation Code of Practice Agreement	The agreement of that name, as amended from time to time.
Meter Operator	A person, registered with the Registration **Authority**, appointed by either a **Supplier** or **Customer** to provide electricity meter operation services. (This **Distribution Code** does not place any direct obligation on **Meter Operators** other than through the appointment by either a **Supplier** or a **Customer**.)
Minimum Generation	The minimum output which a **Generation Set** can reasonably generate as registered under the **Distribution Data Registration Code**,
National Electricity Transmission System	The **Onshore Transmission System** and **Offshore Transmission System .**
National Electricity Transmission System Demand	The amount of electricity supplied from the **Grid Supply Points** plus:- (a) that supplied by **Embedded Large Power Stations**, and (b) that supplied by **Embedded Transmission System**, and (c) exports from the **National Electricity Transmission System** across **External Interconnections**, and (d) **National Electricity Transmission System** losses,and, for the purposes of this definition, includes the **Demand** taken by Station Transformers and Pumped Storage Units.
NGC	National Grid Electricity Transmission plc.
Normal Operating Frequency	The number of Alternating Current cycles per second, expressed in Hertz at which the **System** normally operates, ie 50 Hertz.
Offshore	Means in Offshore Waters, as defined in Section 90(9) of the Energy Act 2004.
Offshore Transmission Implementation Plan	As defined in the Transmission Licence

Offshore Transmission System Operator (OTSO)	The **NGC** acting as operator of an **Offshore Transmission System .**
Offshore Transmission Licensee	The holder of a licence granted under Section 6 (1)(b) of the **Act** excluding **NGC**, **SPT** and **SHETL**.
Offshore Transmission System	Has the meaning set out in the **Grid Code**.
Onshore Transmission Licensees	**NGC**, **SHETL** and **SPT**
Onshore Transmission System	Has the meaning set out in the **Grid Code.**
Operation	A scheduled or planned action relating to the operation of the **System.**
Operation Diagrams	Diagrams which are a schematic representation of the **HV Apparatus** and the connections to all external circuits at a **Connection Point,** incorporating its numbering, nomenclature and labelling.
Operational Boundary	The boundary between the **Apparatus** operated by the **DNO** or a **User** and the **Apparatus** operated by **Other Authorised Distributor(s)** or other **User(s)**, as specified in the relevant **Site Responsibility Schedule**.
Operational Data (OD)	Information to be supplied pursuant to the **Distribution Operating Codes** and as set out in the Schedules to the **DDRC**.
Operational Day	The period from 0500 hours on one day to 0500 on the following day.
Operational Effect	Any effect on the **Operation** of the relevant other **System** which causes the **National Electricity Transmission System** or **DNO's Distribution System**or the **System** of the other **User** or **Users,** as the case may be, to operate (or be at a materially increased risk of operating) differently from the way in which they would or may have operated in the absence of such an effect.
Operational Planning	The procedure set out in **Distribution Operating Code** DOC2 comprising, through various timescales, the co-ordination of planned outages of **Users' Plant** and **Apparatus**.
Operational Planning Phase	The period from 8 weeks to 3 years inclusive ahead of real time operation.
Other Authorised Distributor	A **User** authorised by Licence or exemption to distribute electricity and having a **User Distribution System** connected to the **DNO's Distribution System.**
Output Usable or OU	That portion of **Registered Capacity** which is not unavailable due to a **Planned Outage** or breakdown.

Ownership Boundary	The electrical boundary between the **Equipment** owned by one **DNO** or **User** and the **Equipment** owned by another **User**.
Partial Shutdown	The same as a **Total Shutdown** except that all generation has ceased in a separated part of the **Total System** and there is no electricity supply from **External Interconnections** or other parts of **Total System** to that part of the **Total System** and, therefore, that part of the **Total System** is shutdown with the result that it is not possible for that part of the **Total System** to begin to function again without **NGC's** directions relating to a **Black Start**.
Peak Demand	The highest level of **Demand** recorded/forecast for a 12-month period, as specified in the relevant sections of the **Distribution Code**.
Phase (Voltage) Unbalance	The ratio (in percent) between the rms values of the negative sequence component and the positive sequence component of the voltage.
Planned Outage	An outage of **Generating Plant** or of part of the **National Electricity Transmission System** or of part of a **Distribution System.**
Plant	Fixed and movable items used in the generation and/or supply and/or transmission of electricity other than **Apparatus**.
Power Factor	The ratio of **Active Power** to apparent power (apparent power being the product of voltage and alternating current measured in volt-amperes and standard multiples thereof, ie VA, kVA, MVA).
Power Island	**Generation Sets** at an isolated **Power Station**, together with complementary local **Demand.** In Scotland a **Power Island** may include more than one **Power Station**.
Power Station	An installation comprising one or more **Generation Sets** (even where sited separately) and/or controlled by the same **Generator** and which may reasonably be considered as being managed as one **Power Station.**
Preliminary Project Planning Data	Data relating to a proposed **User Development** at the time the **User** applies for a **Connection Agreement** but before an offer is made.
Programming Phase	The period between the **Operational Planning Phase** and the **Control Phase**. It starts at the 8 weeks ahead stage and finishes at 17:00 on the day ahead of real time
Protection	The provisions for detecting abnormal conditions in a **System** and initiating fault clearance or actuating signals or indications.

Qualifying Standard	Electrical standards in use by **DNO**s and included in the **Distribution Code Review Panel's** governance procedures, and falling into one of the categories below: **i. Annex 1 Standard** **ii. Annex 2 Standard** **iii. Individual DNO Standard**
Reactive Power	The product of voltage and current and the sine of the phase angle between them which is normally measured in kilovar (kVAr) or megavar (MVAr).
Registered Capacity	The normal full load capacity of a **Generation Set** as declared by the **Generator** less the MW consumed when producing the same; ie for all **Generators**, including **Customer With Own Generation,** this will relate to the maximum level of **Active Power** deliverable to the **DNO's Distribution System**. For **Generation Sets** connected to the **DNO's Distribution System**via an inverter, the inverter rating is deemed to be the **Generation Set's** rating.
Registered Data	Data referred to in the schedules to the **Distribution Data Registration Code.**
Remote Transmission Assets.	Any **Plant** and **Apparatus** or meters owned by **NGC** which: a) are **Embedded** in the **DNO's Distribution System** and which are not directly connected by **Plant** and/or **Apparatus** owned by **NGC** to a sub-station owned by **NGC**; and b) are by agreement between **NGC** and the **DNO** operated under thedirection and control of the **DNO.**
Requesting Control Person	Pursuant to DOC8, the person requesting **Safety Precautions** at an **Operational Boundary**.
Safety From The System	That condition which safeguards persons working on or testing **Apparatus** from the dangers which are inherent in working on items of **Apparatus** which are used separately or in combination in any process associated with the generation, transmission or distribution of electricity.
Safety Management System	The procedure adopted by the **DNO** or a **User** to ensure the safe **Operation** of the **System** and the safety of personnel required to work on that **System**.
Safety Precautions	The procedures specified within a **Safety Management System.**
Safety Rules	The rules or procedure of the **DNO** or a **User** to ensure **Safety From The System**.
Scheduling	The procedure for determining intended usage of **Generating Plant.**

Secretary of State	Has the same meaning as in the **Act**.
SHETL	Scottish Hydro-Electric Transmission Limited
Significant Incident	An **Event** on the **Transmission System** or **DNO's Distribution System** or in a **User's System** which has or may have a significant effect on the **System** of others.
Site Responsibility Schedule	A schedule defining the ownership, operation and maintenance responsibility of **Plant** and **Apparatus** at a **Connection Point** of the **DNO**.
Small Power Station	A **Power Station** which is connected to a **System** notionally connected to a **Grid Supply Point** in: a. **NGC's** Transmission Area with a **Registered Capacity** of less than 50MW; b. SP Transmission Limited's Transmission Area with a **Registered Capacity** of less than 30MW; c. Scottish Hydro-Electric Transmission Limited's Transmission Area with a **Registered Capacity** of less than 10 MW.
SPT	Scottish Power Transmission Limited
Standard Planning Data (SPD)	General information required by the **DNO** under the **Distribution Planning Code**.
Standby	The supply of electricity by a **Supplier** to a **Customer** on a periodic or intermittent basis to make good any shortfall between the **Customer's** total supply requirements and that met by his own generation.
Superimposed Signals	Those electrical signals present on a **Distribution System** for the purposes of information transfer.
Supplier	(a) A person supplying electricity under an Electricity Supply Licence; or (b) A person supplying electricity under exemption under the **Act**; in each case acting in its capacity as a supplier of electricity to **Customers** in **Great Britain** .
Supply Agreement	An agreement for the supply of electricity made between a **Supplier** and a consumer of electricity.
System	An electrical network running at various voltages.
System Control	The administrative and other arrangements established to maintain as far as possible the proper safety and security of the **System**.
System Incident Centre	A centre set up by the **DNO** pursuant to the declaration of a **Joint System Incident**, under DOC 9, to assume control of the incident.

System Stability	The ability of the **System** for a given initial operating condition to regain a state of operating equilibrium after being subjected to a given disturbance, with most **System** variables being within acceptable limits so that practically the whole **System** remains intact.
System Test	That test or tests which involve simulating conditions or the controlled application of irregular, unusual or extreme conditions on the **Total System** or any part of it, but not including routine testing, commissioning or recommissioning tests.
Test Coordinator	A suitably qualified person appointed to coordinate **System Test** pursuant to DOC12.
Test Panel	A panel, the composition of which is detailed in DOC12, and which will be responsible for formulating **System Test** proposals and submitting a test programme.
Top - Up	The supply of electricity by any **Supplier** to the **Customer** on a continuing or regular basis to make good any shortfall between the **Customer's** total supply requirements and that met from other sources.
Total Shutdown	The situation existing when all generation has ceased and there is no electricity supply from **External Interconnections** and therefore the **Total System** has shutdown with the result that it is not possible for the **Total System** to begin to function again without **NGC's** directions relating to a **Black Start** .
Total System	The **National Electricity Transmission System** and all **Systems** of **Users** of this **National Electricity Transmission System** in **Great Britain and Offshore.**
Transmission Licence	The licence granted under Section 6(1)(b) of the **Act**.
Transmission Licensee	Any **Onshore Transmission Licensee** or **Offshore Transmission Licensee**.
Transmission System	Has the same meaning as the term "licensee's transmission system" in the **Transmission Licence** of a **Transmission Licensee**.
Unmetered Supply	A supply of electricity to premises which is not, for the purposes of calculating charges for electricity supplied to the **Customer** at such premises, measured by metering equipment.
User	A term used in various sections of the **Distribution Code** to refer to the persons using the **DNO's Distribution System**, more particularly identified in each section of the **Distribution Code**, including for the avoidance of doubt the **OTSO** for **Embedded Transmission System.**

User Development	Either a **User's Plant** and/or **Apparatus** and/or **System** to be connected to the **DNO's Distribution System**, or a modification relating to a **User's Plant** and/or **Apparatus** and/or **System** already connected to the **DNO's Distribution System**, or a proposed new connection or modification to the connection within the **User's System**.
Voltage Reduction	The method to temporarily control **Demand** by reduction of **System** voltage.
Weekly Average Cold Spell (ACS) Condition	That particular combination of weather elements that gives rise to a level of **Peak Demand** within a week, taken to commence on a Monday and end on a Sunday, which has a particular chance of being exceeded as a result of weather variation alone. This particular chance is determined such that the combined probabilities of **Demand** in all weeks of the year exceeding the annual **Peak Demand** under **Annual ACS Conditions** is 50%, and in the week of maximum risk the weekly **Peak Demand** under **Weekly ACS Conditions** is equal to the annual **Peak Demand** under **Annual ACS Conditions.**

DGD 2. CONSTRUCTION OF REFERENCES

In this **Distribution Code**:-

(i) The Table of contents, the Guide and headings are inserted for convenience only and shall be ignored in construing the **Distribution Code**.

(ii) Unless the context otherwise requires, all references to a particular paragraph, sub-paragraph, Annex, Appendix or Schedule shall be a reference to that paragraph, sub-paragraph, Annex, Appendix or Schedule in or to that part of the **Distribution Code** in which the reference is made.

(iii) Unless the context otherwise requires the singular shall include the plural and vice versa, references to any gender shall include any individual, body corporate, unincorporated association, firm or partnership and any other legal entity.

(iv) References to the words "include" or "including" are to be construed without limitation to the generality of the preceding words.

(v) Unless there is something in the subject matter or the context which is inconsistent therewith, any reference to an Act of Parliament or any Section of or Schedule to, or other provision of an Act of Parliament shall be construed at the particular time, as including a reference to any modification, extension or re-enactment thereof then in force and to all instruments, orders and regulations then in force and made or deriving validity from the relevant Act of Parliament.

(vi) References to "in writing" or "written" include typewriting, printing, lithography and other modes of reproducing words in a legible and non-transitory form and, except where otherwise stated, includes suitable means of electronic transfer, such as electronic mail. In all cases the form of notification and the nominated persons or departments and addresses of the sender and recipient of the data or information shall be agreed by the **DNO** and **User** and the sender shall be able to confirm receipt of the information by the recipient. In the case of electronic transfer the sender and recipient shall be able to reproduce the information in non-transitory form.

(vii) Where the **Distribution Glossary and Definitions** refers to any word or term which is more particularly defined in a part of the **Distribution Code**, the definition in that part of the **Distribution Code** will prevail over the definition in the **Distribution Glossary and Definitions** in the event of any inconsistency.

(viii) A cross reference to another document or part of the **Distribution Code** shall not of itself impose any additional or further or co-existent right in the part of the text where such cross-reference is contained.

(ix) Nothing in the **Distribution Code** is intended to or shall derogate from the **DNO's** statutory or licence obligations.

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, 6th Floor, Dean Bradley House, 52 Horseferry Road, London SW1P 2AF, http://**www.energynetworks.org**/. A copy of Engineering Memorandum 7907 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 G59/3-3**

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) **EM7907**

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 P25/1**

The short circuit characteristics of electricity boards low voltage distribution networks and the co-ordination of overcurrent protective devices on 230V single phase supplies up to 100A.

7 **Engineering Recommendation P26**

The estimation of the maximum prospective short circuit current for three phase 415V supplies.

8 **Engineering Recommendation P28**

Planning limits for voltage fluctuations caused by industrial, commercial and domestic equipment in the United Kingdom.

9 **Engineering Recommendation P29**

Planning limits for voltage unbalance in the United Kingdom for 132kV and below.

10 **Technical Specification 41-24**

Guidance for the design, installation, testing and maintenance of main earthing systems in substations

11 **Engineering Recommendation S34**

A guide for assessing the rise of earth potential at substation sites.

12 **Engineering Recommendation G83/2**

Recommendations For The Connection of Type Tested Small-Scale Embedded Generators (Up To 16 A Per Phase) In Parallel With Public Low-Voltage Distribution Networks.

DISTRIBUTION CODE INTRODUCTION (DIN)

DISTRIBUTION INTRODUCTION (DIN)

DIN1 INTERPRETATION

DIN1.1 This **Distribution Code** has been prepared by the **DNOs**. Words and expressions printed in bold type are listed in the **Distribution Glossary and Definitions.**

DIN1.2 The **DNO**, unless indicated otherwise, shall be construed as acting in its **Distribution Business** capacity**.**

DIN2 DISTRIBUTION LICENCE DUTY

DIN2.1 The **Distribution Licence** (Condition 21) requires the **DNO** in consultation with **Authorised Electricity Operators** liable to be materially affected thereby to prepare and at all times have in force and implement and comply with a **Distribution Code** which:

(a) Covers all material technical aspects relating to connections to and the operation and use of the **DNO's Distribution System** and the operation of electric lines and electrical **Plant** and **Apparatus** connected to the **DNO's Distribution System**. The **Distribution System** of any **Other Authorised Distributor** shall comply with the **Distribution Code** at the point of connection with the **DNO's Distribution System**.

(b) Is designed so as to:

(i) Permit the development, maintenance, and operation of an efficient, coordinated and economical **System** for the distribution of electricity.

(ii) Facilitate competition in the generation and supply of electricity.

(iii) Efficiently discharge the obligations imposed upon **DNOs** by the **Distribution Licence** and comply with the Regulation (where Regulation has the meaning defined in the **Distribution Licence**) and any relevant legally binding decision of the European Commission and/or Agency for the Co-operation of Energy Regulators.

(iv) Promote efficiency in the implementation and administration of the **Distribution Code.**

DIN2.2 The **Distribution Code** is in the same form for all **Users** of the same category. In drawing up and implementing the **Distribution Code,** the **Distribution Licence** requires that the **DNO** shall not discriminate against or prefer:

(a) any one or any group of persons, or

(b) the **DNO** in the conduct of any business other than the **Distribution Business**, in favour of or against any one other or any other group of persons.

DIN2.3 It is also a requirement of the **Distribution Licence** that the **DNO** shall comply with the provisions of the **Grid Code** so far as applicable to the licensed business, and the **Distribution Code** is designed to ensure that these obligations can be met by the **DNO.**

DISTRIBUTION INTRODUCTION (DIN)

DIN3 SCOPE

The **Distribution Code** shall be complied with by the **DNO** and by potential and existing **Generators**, **Suppliers** and **Customers** connected to or seeking connection to the **DNO's Distribution System** being referred to as **Users** as expressly defined in the various parts of the **Distribution Code**.

DIN4 GENERAL REQUIREMENTS

DIN4.1 The **Distribution Code** contains procedures to permit equitable management of day to day technical situations in the Electricity Supply Industry, taking account of a wide range of operational conditions likely to be encountered under both normal and exceptional circumstances. It is nevertheless necessary to recognise that the **Distribution Code** cannot predict and address all possible operational situations. **Users** must therefore understand and accept that the **DNO**, in such unforeseen circumstances, will be required, in the course of the reasonable and prudent discharge of its responsibilities, to act in pursuance of any one or any combination of the following "General Requirements":

(a) The need to preserve or restore the integrity of the **DNO's Distribution System** or the **National Electricity Transmission System**

(b) The compliance by the **DNO** with its **Distribution Licence** obligations.

(c) The compliance by others with obligations imposed by Licences issued under the **Act.**

(d) The avoidance of breakdown, separation or collapse (total or partial) of the **DNO's Distribution System** or the **National Electricity Transmission System** or the **Total System**.

(e) The preservation of safety under all circumstances, including the prevention of personal injury.

(f) The prevention of damage to **Plant** and/or **Apparatus**.

(g) The achievement of objectives specifically identified in the **Distribution Code**.

(h) The compliance by the **DNO** with the **Grid Code**.

(i) In the absence of an applicable provision of the **Distribution Code** or any of these General Requirements:

(i) The application of a policy aimed at the equitable sharing amongst **User** of any temporary restriction that might be necessary in exceptional circumstances, and

(ii) The application of then current industry practice.

DIN4.2 **Users** shall provide such reasonable co-operation and assistance as the **DNO** may reasonably request in pursuance of the above General Requirements.

DIN5 CODE RESPONSIBILITIES

DIN5.1 The **Distribution Code** sets out procedures and principles governing the **DNO's** relationship with all **Users** of the **DNO's Distribution System.**

DIN5.2 The **DNO** and all **Users** have a duty under this **Distribution Code** to provide such information and resources as are necessary to facilitate compliance with and implementation of the **Distribution Code**. The **DNO** can only plan and operate the **DNO's Distribution System** and provide information for the planning and operation of the **National Electricity Transmission System**, having regard to the requirements which **Users** have informed the **DNO** they wish to make of the **DNO's Distribution System**. The **DNO** must be able to rely upon the information which **Users** have supplied to it and will not be held responsible for any consequences which arise from its reasonable and prudent actions on the basis of such information supplied by any **User** or **Users**.

DIN6 CONFIDENTIALITY

The **Distribution Code** contains procedures under which the **DNO's Distribution Business**, in pursuance of its obligation as a **DNO**, will receive information from **Users** relating to the intentions of such **Users**. The **DNO** shall not, except in pursuance of specific requirements of the **Distribution Code**, disclose such information to any **User** or other person without the prior written consent of the provider of the information, subject to the requirements of the **Distribution Licence** (Condition 39).

DIN7 PUBLICATIONS

The **Distribution Code** contains references to various Electricity Supply Industry publications which provide guidance on planning and design criteria. A list of the publications referred to is included as an Annex 1 to the **Distribution Code**.

DISTRIBUTION GENERAL CONDITIONS (DGC)

DISTRIBUTION GENERAL CONDITIONS (DGC)

DGC1 INTRODUCTION

The **Distribution Glossary and Definitions** apply to all provisions of the **Distribution Code**. Their objective is to ensure, to the extent possible, that various sections of the **Distribution Code** work together and work in practice for the benefit of all **Users**.

DGC2 SCOPE

The **Distribution Glossary and Definitions** apply to the **DNO** and to all **Users**.

DGC3 UNFORESEEN CIRCUMSTANCES

If circumstances not envisaged by the provisions of the **Distribution Code** should arise, the **DNO** shall, to the extent reasonably practicable in the circumstances, consult promptly and in good faith with all affected **Users** in an effort to reach agreement as to what should be done. If agreement between the **DNO** and those **Users** cannot be reached in the time available, the **DNO** shall determine what is to be done.

Wherever the **DNO** makes a determination, it shall do so having regard, wherever possible, to the views expressed by **Users** and, in any event, to what is reasonable in all the circumstances. Each **User** shall comply with all instructions given to it by the **DNO** following such a determination provided that the instructions are consistent with the then current technical parameters of the particular **User's System** registered under the **Distribution Code**. The **DNO** shall promptly refer all such unforeseen circumstances and any such determination to the **Distribution Code Review Panel** for consideration in accordance with DGC4.2(e).

DGC4 THE DISTRIBUTION CODE REVIEW PANEL

DGC4.1 The **DNOs** shall establish and maintain the **Panel**, which shall be a standing body, to carry out the functions referred to in paragraph DGC4.2.

DGC4.2 The **Panel** shall:-

(a) Keep the **Distribution Code** and its working under review, including any necessary requirements for maintaining variations for Scotland and England and Wales;

(b) to minimize the necessary differences in the treatment of issues in Scotland from their treatment in England and Wales;

(c) review all suggestions for modifications to the **Distribution Code** which the **Authority** or any **User** may wish to submit to a **DNO** for consideration by the **Panel** from time to time;

(d) publish recommendations as to modifications to the **Distribution Code** that a **DNO** or the **Panel** feels are necessary or desirable and the reasons for the recommendations;

(e) issue guidance in relation to the **Distribution Code** and its implementation, performance and interpretation when asked to do so by any **User;** and

(f) consider what changes are necessary to the **Distribution Code** arising out of any unforeseen circumstances referred to it by the **DNO** under DGC3.

(g) produce an Annual Report of the activities of the **Panel**; and

(h) establish and maintain governance arrangements for **Qualifying Standard**s that have a material effect on **User**s of the **Distribution System** as follows:

(1) national electricity industry standards that implement **Distribution Code** requirements, and which are listed in Annex 1 of the Distribution Code and form part of the **Distribution Code**;

(2) other national electricity industry standards that have a material affect on **User**s but do not implement **Distribution Code** requirements and which do not form part of the **Distribution Code** technical requirements. The Panel will maintain a list of these standards. For convenience this list is attached as Annex 2; and

(3) standards adopted by individual DNOs, which are published as such by those DNOs and which have a material effect on Users;

(i) maintain a detailed procedure for the overall governance arrangements for **Qualifying Standard**s, which shall be agreed by resolution of the **Panel** from time to time; and

(j) have regard for commercial matters insofar as they interact with the **Distribution Code** and take into account the commercial implications of **Distribution Code** provisions when developing modifications to the **Distribution Code** and **Annex 1 Standard** and **Annex 2 Standard**. However the **Panel** shall not be required to discuss issues relating solely to commercial matters.

DGC4.3 The **Panel** shall consist of:-

(a) A Chairman and up to 5 members appointed by the **ITCG**, at least one of whom will be a member of the Grid Code Review Panel and at least one of whom will be an **Independent Distribution Network Operator**;

(b) a person appointed by the **Authority**;

(c) the following members:-

(i) 2 persons representing onshore **Generators** with **Embedded Generating Plant** who are **BM Participants** and are active (ie submitting bid-offer data) in the **Balancing Mechanism**;

(ii) 2 persons representing onshore **Generators** with **Embedded Generating Plant** other than those in (i) above; and

(iii) 2 persons, other than **Supplier**, representing **Users** without **Generating Plant;**

(iv) a person representing the **OTSO;**

(v) a person representing **Suppliers**; and

(d) A person representing customers appointed by the **CA** and **CAS.**

Each of the above shall be appointed pursuant to the rules issued pursuant to DGC4.4.

DGC4.4 The **Panel** shall establish and comply at all times with its own Constitution and Rules and procedures relating to the conduct of its business, which Constitution Rules and procedures shall be approved by the **Authority** and are set out in the "Constitution and Rules of the **Distribution Code Review Panel**".

DGC4.5 As part of the **DNO**'s obligation to review periodically the **Distribution Code**and its implementation as required by Condition 21 of the **DNO**'s **Distribution Licence**, the **DNO** shall consult all **Authorised Electricity Operators** liable to be affected in relation to all proposed modifications to the **Distribution Code** and shall submit all proposed modifications to the **Distribution Code** to the **Panel** for discussion prior to such consultation. Such review of the **Distribution Code** undertaken by the **DNO** shall involve an evaluation of whether any modification would better facilitate the achievement of the **Distribution Code** objectives, as provided in the **DNO**'s **Distribution Licence,** and, where the impact on greenhouse gasses is likely to be material, this shall include an assessment of the quantifiable impact of any proposed modification on greenhouse gas emissions, to be conducted in accordance with any guidance (on the treatment of carbon costs and evaluation of greenhouse gas emissions) as may be issued by the **Authority** from time to time and in accordance with the rules pursuant to DGC4.4.

DGC4.6 The **DNO**s shall establish and maintain a group to be known as the **ITCG**, which shall be a standing body comprised of representatives of the **DNO**s to carry out the functions referred to in its own constitution and rules.

DGC4.7 The **ITCG** shall establish and comply at all times with its own constitution and rules relating to the conduct of its business, which constitution and rules shall be approved by the **Authority**.

DGC4.8 The **DNO**s shall fund and share the costs incurred by or on behalf of the **DNO**s in relation to the operation of the **Panel** and the **ITCG** in accordance with the cost apportionment mechanism set out in the constitution and rules of the **ITCG**.

DGC5 COMMUNICATION BETWEEN THE DNO AND USERS

Unless otherwise specified in the **Distribution Code,** the methods of operational communication (other than relating to the submission of data and notices) shall be agreed between the **DNO** and **User** from time to time. The **DNO** shall operate an enquiry service for dealing with incidents on the **DNO's Distribution System** and interruptions in supply.

DGC6 DATA AND NOTICES

DGC6.1 Data and notices to be exchanged between the **DNO** and **User** under the **Distribution Code** (other than data which is the subject of a specific requirement of the **Distribution Code** as to the manner of its delivery) shall be delivered in writing in accordance with DGD2 (vi).

DGC6.2 All data items, where applicable, will be referenced to nominal voltage and **Frequency** unless otherwise stated.

DISTRIBUTION GENERAL CONDITIONS (DGC)

DGC7 **OWNERSHIP OF** PLANT **AND/OR** APPARATUS

References in the **Distribution Code** to **Plant** and/or **Apparatus** of a **User** include **Plant** and/or **Apparatus** used by a **User** under an agreement with a third party.

DGC8 **SYSTEM CONTROL**

Where a **User's System** (or part thereof) is, by agreement, under the control of the **DNO**, then for the purposes of communication and co-ordination in operational timescales the **DNO** can (for those purposes only) treat that **User's System** (or part thereof) as part of the **DNO's Distribution System** but as between the **DNO** and **Users**, it shall remain to be treated as the **User's System** (or part thereof).

DGC9 **EMERGENCY SITUATIONS**

Users should note that the provisions of the **Distribution Code** may be suspended in whole or in part during a Security Period as more particularly provided for in the **Fuel Security Code**, or in accordance with a **Civil Emergency Direction** issued under a Civil Emergency in accordance with **Distribution Operating Code** DOC9.

DGC10 **DISTRIBUTION CODE RESPONSIBILITIES**

The **Distribution Code** sets out procedures and principles governing the relationship between the **DNO** and all **Users** of the **DNO's Distribution System.**

DGC11 **MODIFICATIONS TO THE DISTRIBUTION CODE**

DGC11.1 Modifications to the **Distribution Code** shall be made in accordance with the procedures set out in the Constitution and Rules of the **Distribution Code Review Panel**.

DGC11.2 Modifications to the **Distribution Code** that change the obligations on **Users** and **DNO**s in relation to the specification of **Equipment** that each has to provide to comply with the **Distribution Code** will not apply retrospectively to **Equipment** already existing at the date of the implemention of the **Distribution Code** change, unless specifically required in the relevant **Distribution Code** clause. However, where the **DNO** or the **User** makes a material alteration to the relevant **Equipment**, then the **DNO** or the **User** will comply with the requirements of the **Distribution Code** currently in force at the date of the material alteration.

DGC11.3 The **DNOs** shall appoint a Code Administrator (as defined in the **Distribution Licence**). The Code Administrator shall (in addition to any powers, duties or functions set out in the **Distribution Code** or the Constitution and Rules of the **Distribution Code Review Panel**):

(a) together with other code administrators, publish, review, and (where appropriate) amend from time to time the Code of Practice (Code of Practice in DGC11.3 has the meaning defined in the **Distribution Licence**);

(b) facilitate the procedures for making a modification to the **Distribution Code**;

(c) have regard to, and in particular (to the extent relevant) be consistent with, the principles contained in the Code of Practice;

(d) provide assistance, insofar as it is reasonably practicable and on reasonable request, to **Authorised Electricity Operators** (including in particular Small Participants as defined in the **Distribution Licence**) and, to the extent relevant, consumer representatives that request the Code Administrator's assistance, in relation to the **Distribution Code** including, but not limited to, understanding the operation of the **Distribution Code**, their involvement in, and representation during, the modification processes (including, but not limited to, **Panel** and/or working group meetings), and accessing information relating to modification proposals and/or modifications.

DISTRIBUTION PLANNING AND CONNECTION CODE (DPC)

DISTRIBUTION PLANNING AND CONNECTION CODE (DPC)

DISTRIBUTION PLANNING AND CONNECTION CODE 1

DPC1 GENERAL INTRODUCTION

DPC1.1 The **Distribution Planning and Connection Code** specifies the technical and design criteria and the procedures to be applied by the **DNO** in the planning and development of the **DNO's Distribution System** and to be taken into account by **Users**, as defined in DPC3 below, in the planning and development of their own **Systems** insofar as the latter affect the operation and use of the **DNO's Distribution System**. Developments on the **DNO's Distribution System** may have an impact on the **National Electricity Transmission System** and this will be taken into account in the planning and development of the **DNO's Distribution System** and the conditions of the **Grid Code** complied with as appropriate.

DPC1.2 This **Distribution Planning and Connection Code** also specifies the technical, design and operational criteria which must be complied with by the **Users**, defined in DPC3 below connected to, or seeking connection to the **DNO's Distribution System,** in the planning and development of their **Systems** in so far as they affect the **DNO's Distribution System.**

DPC1.3 A requirement for reinforcement or extension of the **DNO's Distribution System** or the **National Electricity Transmission System** may arise due to the requirements of a **User** or for a number of other reasons including, but not limited to:

(a) A development on a **User's System** already connected to the **DNO's Distribution System** as a **User Development**.

(b) The introduction of a new **Connection Point** between a **User's System** and the **DNO's Distribution System**.

(c) Transient, or steady state stability considerations.

(d) The development of an existing, or the connection of a new **Customer**.

(e) The cumulative effect of any combination of the above.

DPC1.4 Accordingly, the reinforcement or extension of the **DNO's Distribution System** or the **National Electricity Transmission System** may involve work:

(a) At the **Connection Point** between a **User's System** and the **DNO's Distribution System**.

(b) On distribution or transmission lines or substations or other facilities which join the **Connection Point** to the remainder of the **DNO's Distribution System** or the **National Electricity Transmission System**

(c) At or between points on the **DNO's Distribution System** remote from the **Connection Point.**

DPC1.5 The time required for the planning and development of the **DNO's Distribution System** and any consequential requirement of the **DNO's** interface with the **National Electricity Transmission System** will depend on the type and extent of the necessary reinforcement and/or extension work, the need or otherwise to obtain statutory or other consents by all parties, the associated possibility for a public inquiry and the degree of complexity in undertaking the new work whilst maintaining satisfactory security and quality of supply on the **DNO's Distribution System.** The **Distribution Licence** imposes appropriate timescales on the exchange of information between the **DNO** and **Users.**

DPC1.6 **Planning Data**

DPC1.6.1 **Standard Planning Data**

Standard Planning Data is that data first to be provided by a **User** at the time of an application for a **Connection Agreement**. It comprises data, which is expected normally to be sufficient for the **DNO** to investigate the impact on the **DNO's Distribution System** of any **User Development** associated with an application by the **User** for a **Connection Agreement**. The **DNO** will inform **Users** where more detailed information is required.

DPC1.6.2 **Detailed Planning Data**

Detailed Planning Data comprises additional, more detailed, data not normally expected to be required by the **DNO** to investigate the impact on the **DNO's Distribution System** of any **User Development** associated with an application by the **User** for a **Connection Agreement**.

The **User** may, however, be required by the **DNO** to provide the **Detailed Planning Data** before the **DNO** can make an offer for a **Connection Agreement.** The **DNO** shall only request **Detailed Planning Data** where it considers the provision of such data to be necessary and in such cases the **DNO** shall specify which elements of **Detailed Planning Data** are required.

DPC1.6.3 **Standard Planning Data** and **Detailed Planning Data** requirements are specified for different **User Developments** of different types in DPC5 and DPC7 of this **Distribution Planning and Connection Code** and summarised in the **Distribution Data Registration Code.**

DPC1.6.4 **Estimated Data**

Where data is not available at the feasibility stage or preliminary stage of a **User Development** then the **User** may provide a reasonable estimate of the data to be requested by the **DNO** and in such cases the data shall be identified as estimated data by the **User.** Estimated data supplied by **Users** in pursuance of this **Distribution Planning and Connection Code** should, where practicable, be replaced by actual validated values prior to connection.

DPC1.6.5 **Assumed Data**

Where data is not available or has not been provided by the **User** at the feasibility stage or preliminary stage of a **User Development** then the **DNO** may make reasonable assumptions of the data required for assessment of the **User Development** and in such cases the **User** shall be notified of the assumed values

adopted. Where the **DNO** has notified the **User** that assumed data has been adopted by the **DNO** in pursuance of this **Distribution Planning and Connection Code** then the **User** should, where practicable provide actual validated values to replace the assumed values prior to connection.

DPC1.7 **Status of Planning Data**

It is in the interests of all **Users** to initiate early discussion with the **DNO** regarding any proposed **User Development,** which may have an impact on the **DNO's Distribution System**.

For the purposes of this **Distribution Planning and Connection Code** it is considered that development will consist of four stages: -

(a) Feasibility Project Stage

At this optional stage the **User** will be considering a **User Development**. The **DNO** will be pleased to conduct a short meeting to discuss the **User's** requirements and provide guidance on the likely implications for the **DNO's Distribution System**.

If at this stage the **User** requires further information then the **DNO** will request **Standard Planning Data** from the **User** and provide a feasibility assessment identifying items of significant cost to the extent permitted by the information provided by the **User**. In accordance with the **DNO's** Statement of Charges a charge will be payable by any potential **User** for such an assessment.

At the feasibility project stage a number of iterative studies may be carried out by the **DNO** at the request of the **User** (or by the **User**) to identify opportunities for connection and corresponding costs and technical issues. The **Feasibility Project Data** requested by the **DNO** from the **User** to carry out these feasibility studies may include both **Standard Planning Data** and **Detailed Planning Data** depending on the complexity of the assessment studies required to be carried out by the **DNO**.

(b) Preliminary Project Stage

At this stage the **User** will have submitted an application for a **Connection Agreement**. The **Preliminary Project Planning Data** requested by the **DNO** from the **User** for assessing the connection and costs may include both **Standard Planning Data** and **Detailed Planning Data.**

c) Committed Project Stage

At this stage a **Connection Agreement** will have been established. The **Committed Project Planning Data** on which the **Connection Agreement** is based may include both **Standard Planning Data** and **Detailed Planning Data.**

(d) Registered Project Stage

At this stage the connection will be physically established. The **Registered Data** for the connection shall include replacements for estimated and assumed values, where practicable, using validated actual values and updated forecasts for future data items.

DPC1.8 Reference is made in the **Distribution Planning and Connection Code t**o the **DNO** supplying information or advice to **Users**. For the avoidance of doubt, unless the context otherwise requires, such information or advice will be furnished by the **DNO** upon request by the **User** (whether during the application for connection process or otherwise).

DPC1.9 The provisions of the **Distribution Planning and Connection Code** shall, subject to DPC1.8, be applicable to:

(a) All existing connections as at the date of commencement of **DNO's Distribution Licence.**

(b) All new or modified connections thereafter.

DPC1.10 In considering the approval of existing connections at the date of commencement of its **Distribution Licence,** the **DNO** shall have regard to the fact that previous changes in technical and design standards have not been applied retrospectively in every case, and the **DNO** shall not seek, under the terms of these **Distribution Planning and Connection Code** Conditions, to impose retrospective changes where these had not been required in the past, except where the **DNO** can reasonably demonstrate that significant change has occurred to conditions which existed when the matter was previously considered by the **DNO** or its predecessors.

DISTRIBUTION PLANNING AND CONNECTION CODE 2

DPC2 OBJECTIVES

The objectives of the Distribution Planning and Connection Code are to:-

(a) Enable the **DNO's Distribution System** to be planned, designed and constructed to operate economically, securely and safely.

(b) Facilitate the use of the **DNO's Distribution System** by others and to specify a standard of supply to be provided.

(c) Establish technical conditions which facilitate the interfacing of **Systems** at points of entry to and exit from the **DNO's Distribution System**.

(d) Formalise the exchange of **System** planning data.

(e) Provide sufficient information for a **User** to assess opportunities for connection and to plan and develop his **System** such as to be compatible with the **DNO's Distribution System.**

DISTRIBUTION PLANNING AND CONNECTION CODE (DPC)

DISTRIBUTION PLANNING AND CONNECTION CODE 3

DPC3 SCOPE

DPC3.1 The **Distribution Planning and Connection Code** specifies the planning, design and connection requirements for **Distribution Systems** owned by the **DNO** and for connections to those **Systems**.

DPC3.2 The **Users** to whom the **Distribution Planning and Connection Code** applies are those who use or intend to use the **DNO's Distribution System** and comprise the following:-

(a) **Embedded Generators.**

(b) **Suppliers**.

(c) **Customers** including those with **Unmetered Supplies** who are connected to the **DNO's Distribution System**.

(d) **Other Authorised Distributors** connected to the **DNO's Distribution System.**

(e) **Meter Operators** which perform services in respect of **Equipment** connected to the **DNO's Distribution System.**

DISTRIBUTION PLANNING AND CONNECTION CODE 4

DPC4 DESIGN PRINCIPLES AND STANDARDS

DPC4.1 **Introduction**

DPC4.1.1 Planning criteria are based on the requirement to comply with statutory requirements, **Distribution Licence** conditions and other obligations placed on the **DNO** and **Users**.

DPC4.1.2 The **DNO** has a duty to develop and maintain an efficient, secure and co-ordinated **System** of electricity supply that is both economical and safe.

DPC4.1.3 **DPC4** sets out current principles and standards to be applied in the design of the **DNO's Distribution System** and any **User** connections to that **System.** Each scheme for reinforcement or modification of the **DNO's Distribution System** is individually designed in the light of economic and technical features associated with the particular **System** limitations under consideration.

DPC4.1.4 Nothing in DPC4 is intended to inhibit design innovation**.** DPC4 is, therefore, based upon the performance requirements of the **DNO's Distribution System** necessary to meet the above criteria.

DPC4.1.5 The technical and design criteria applied in the planning and development of the **DNO's Distribution System** are listed in Annex 1 to the **Distribution Code**. These standards may be subject to revision from time to time in accordance with the provision of the **Distribution Licence**.

DPC4.2 **Standard of Supply**

DPC4.2.1 **Security**

In accordance with the Condition 5 of the **Distribution Licence, DNOs** shall plan and develop their **DNO's Distribution Systems** to a standard not less than that set out in DGD Annex 1 Item 4, Engineering Recommendation P2/6 – "Security of Supply" or such other standard of planning as **DNOs** may, with the approval of the **Authority**, adopt from time to time

In accordance with the **Distribution Licence** Scottish Hydro Electric Power Distribution Ltd shall plan and develop its **DNO's Distribution System** in Scotland to a standard set out in EM7907. Engineering Recommendation P2/6 – "Security of Supply" has been modified by Scottish Hydro Electric Power Distribution Ltd as EM7907 and this is accepted by the **Authority**.

DPC4.2.2 **Frequency and Voltage**

DPC4.2.2.1 The **DNO's Distribution System** and any **User** connections to that **System** shall be designed to enable the **Normal Operating Frequency** and voltages supplied to **Customers** to comply with the **ESQCR**.

DPC4.2.2.2 The **Frequency** of the **DNO's Distribution System** shall be nominally 50 Hz and shall normally be controlled within the limits of 49.5 - 50.5 Hz in accordance with principles outlined in the **ESQCR**.

DPC4.2.2.3 In exceptional circumstances, **System Frequency** could rise to values of the order of 52 Hz or fall to values of the order of 47 Hz. Sustained operation outwith the range 47 - 52 Hz is not taken into account in the design of **Plant** and **Apparatus.**

DPC4.2.2.4 Any extension or connection to the **DNO's Distribution System** shall be designed in such a way that it does not adversely affect the voltage control employed on the **DNO's Distribution System**. Information on the voltage regulation and control arrangements will be made available by the **DNO** if requested by the **User.**

DPC4.2.3 **Voltage Disturbances and Harmonic Distortion**

DPC4.2.3.1 General

Under fault and circuit switching conditions the rated **Frequency** component of voltage may fall or rise transiently. The fall or rise in voltage will be affected by the method of earthing of the neutral point of the **DNO's Distribution System** and voltage may fall transiently to zero at the point of fault. BS EN 50160:2010 'Voltage Characteristics of Electricity Supplied by Public Distribution Systems', as amended from time to time, contains additional details of the variations and disturbances to the voltage which shall be taken into account in selecting **Equipment** from an appropriate specification for installation on or connected to the **System**.

DPC4.2.3.2 Voltage Disturbances

Distortion of the **System** voltage waveform, caused by certain types of **Equipment**, may result in annoyance to **Users** of the **DNO's Distribution System** or damage to connected **Apparatus**. In order to limit these effects the following shall apply to **Users'** loads connected to the **DNO's Distribution System:-**

(a) Voltage fluctuations shall comply with the limits set out in DGD Annex 1, Item 9 Engineering Recommendation P28, "Planning limits for voltage fluctuations caused by industrial, commercial and domestic equipment in the United Kingdom".

(b) The harmonic content of a load shall comply with the limits set out in DGD Annex 1, Item 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."

(c) **Phase (Voltage) Unbalance**shall comply with the levels laid down in DGD Annex 1, Item 10 Engineering Recommendation P29, "Planning limits for voltage unbalance in the United Kingdom for 132kV and below".

(d) Traction supplies shall comply as appropriate with the requirements of DGD Annex 1, Item 6. Engineering Recommendation P24 "A.C. traction supplies to British Rail".

Under certain circumstances the **DNO** may agree to other limits or levels.

DPC4.2.3.3 Voltage Step Changes

The effect of voltage step changes caused by the connection and disconnection of **User**'s **Equipment** or **Customer**'s **Demand** to or from the **DNO's Distribution System** must be considered and be subject to limits to avoid unacceptable voltage changes being experienced by other **Customer**s connected to the **DNO's Distribution System**. The magnitude of a voltage step change depends on the method of voltage control, types of load connected and the presence of local generation. Typical limits for voltage step changes caused by the connection and disconnection of **User**'s **Equipment** or **Customer**'s **Demand** to the **DNO's Distribution System**, are ±3% for infrequent planned switching events or outages (in accordance with Engineering Recommendation P28). For unplanned outages such as faults it will generally be acceptable to design to a voltage step change of ±10%.

For the purpose of the **Distribution Code** a voltage step change should be considered to be the change from the initial voltage level to the resulting voltage level after all the **Generation Set** automatic voltage regulator and static VAR compensator actions, and transient decay (typically 5 seconds after the fault clearance or system switching) have taken place, but before any other automatic or manual tap-changing and switching actions have commenced

The voltage depression arising from transformer magnetising inrush current is a short-time phenomenon not generally easily captured by the definition of voltage step change used above. In addition the size of the depression is dependent on the point on wave of switching, and the duration of the depression is relatively short, in that the voltage recovers substantially in under one second.

User's installations should be designed such that transformer magnetising inrush current associated with normal routine switching operations does not cause voltage fluctuations outside those in Engineering Recommendation P28 (ie a maximum of ±3%). To achieve this it may be necessary install switchgear so that sites containing multiple transformers can be energised in stages.

Situations will arise from time to time when complete sites including a significant presence of transformers are energised as a result of post fault switching, post maintenance switching, or carrying out commissioning tests on the **DNO's Distribution System** or on **User**s' Systems. In these situations it will generally be acceptable to design to an expected depression of around ±10%, recognizing that a worst case energization might cause a larger depression, on the basis that such events are considered to be rare and it is difficult to predict the exact depression because of the point on wave switching uncertainty. Should these switching events become more frequent than once per year, then the design should revert to aiming to limit depressions to less than 3%.

DPC4.2.4 **Auto-reclosing and Single Phase Protection Operation**

In connecting to the **DNO's Distribution System** the **User** should be aware that auto-reclosing or sequential switching features may be in use on the **DNO's Distribution System**. The **DNO** will on request provide details of the auto-reclosing or sequential switching features in order that the **User** may take this into account in the design of the **User System**, including **Protection** arrangements.

Users should be aware that the **Protection** arrangements on some **Distribution Systems** may cause disconnection of one phase or two phases only of a three phase supply for certain types of fault.

DPC4.3 **Design Principles**

This section sets out design principles for **Users** (excluding **Generators,** the **OTSO** and **Users** with **Unmetered Supply**), connected at **Low Voltage** and having single phase or three phase supplies protected by fuse(s) or other device(s) rated at 100 amps or less.

DPC4.3.1 Any **User's** installation which complies with the provisions of the Requirements of Electrical Installations BS 7671 as amended from time to time, shall be deemed to comply with the requirements of the **Distribution Code** as regards design and safety.

DPC4.3.2 On the request of a **User** the **DNO** will provide such information, as may be reasonably required, on the design and other characteristics of the **DNO's Distribution System**.

Guidance on the short circuit characteristics of the **Low Voltage System** and associated supplies is provided in **Electricity Supply Industry** engineering publications, including Items 7 and 8 in Annex 1 Engineering Recommendation P25, "The short circuit characteristics of electricity board's low voltage distribution networks and the co-ordination of overcurrent protective devices on 230V Single Phase supplies up to 100 Amps", and Engineering Recommendation P26/1, "The estimation of the maximum prospective short circuit current for three phase 415V supplies".

Design practice for protective multiple earthing is detailed in the **Electricity Supply Industry** engineering publications (including Item 2 in Annex 1 Engineering Recommendation G12/4, "Application of protective multiple earthing to low voltage networks") and in the references contained in those publications.

The **DNO's** information requirements are detailed in DPC5.2.1.

DPC4.4 **Design Principles for all other Users not included in DPC4.3**

DPC4.4.1 **Specification of Equipment, Overhead Lines and Underground Cables**

(a) The principles of design, manufacture, testing and installation of distribution **Equipment**, overhead lines and underground cables, including quality requirements, shall conform to applicable statutory obligations and shall comply with relevant **CENELEC** standards, **IEC** publications, European and British Standards. Further advice will be made available upon request to the **DNO**.

(b) The documents specified in paragraph (a) contain options for purchaser selection which together with other requirements that are necessary to meet **System** design needs, shall be specified so as to provide performances and ratings in line with **Electricity Supply Industry (ESI)** Technical Specifications (some of which are published as **Electricity Supply Industry (ESI)** Standards), British Electricity Board Specifications, Engineering Recommendations and Area Chief Engineers (ACE) Reports and Engineering Technical Reports and **Electricity Supply Industry (ESI)** documents as listed in Annex 1 of the **Distribution Code** or such other specifications as the **DNO** may adopt from time to time by agreement with the **Authority**.

(c) The specifications of **Equipment**, overhead lines and cables shall be such as to permit **Operation** of the **DNO's Distribution System** within the **Safety Management System** of the **DNO**, details of which will be made available by the **DNO** upon request.

(d) **Equipment** shall be suitable for use at the operating **Frequency**, within the intended operating voltage range and at the design short-circuit rating of the **DNO's Distribution System** to which it is connected having due regard to fault carrying capabilities and making and breaking duties. In appropriate circumstances, details of the **System** to which connection is to be made will be provided by the **DNO**. Guidance on the short circuit characteristics of the three phase **Low Voltage** system and associated supplies is provided in **Electricity Supply Industry** engineering publications, including Item 8 in DGD Annex 1 Engineering Recommendation P26/1, "The estimation of the maximum prospective short circuit current for three phase 415V supplies".

(e) Connections to the **DNO's Distribution System** at 132kV may be subject to the requirements of Annex 2 item 5 (ER P18). **DNO**s will have network specific complexity limits for **System**s operating at voltages below 132kV which they will make available on request.

(f) Cables**,** overhead lines transformers and other **Equipment** shall be operated within the thermal rating conditions contained in the appropriate standards, specifications, and other relevant publications, taking into account the intended use. Such information will be made available by the **DNO** upon request.

(g) The standards, publications and specifications referred to in paragraphs (a) to (f) above are such standards, publications and specifications current at the time that the **Plant** and/or **Apparatus** was manufactured (and not commissioned) in the case of **Plant** and/or **Apparatus** on the **Total System**, or awaiting use or re-use. If any such **Plant/Apparatus** is subsequently moved to a new location or used in a different way, or for a different purpose, or is otherwise modified then such standards, publications and specifications current at the time that the **Plant** and/or **Apparatus** was manufactured (and not commissioned) will apply provided that in applying such standards, publications and specifications the **Plant** and/or **Apparatus** is reasonably fit for its intended purpose having due regard to the obligations of the **DNO** and the **User** under their respective licences.

DPC4.4.2 **Earthing**

(a) The arrangements for connecting the **DNO's Distribution System** with earth shall be designed to comply with the requirements of the **ESQCR** and relevant European and British_Standards. Guidance as to the design of earthing systems is contained in **Electricity Supply Industry (ESI)** engineering publications, including Items 11, and 12 in DGD Annex 1 Technical Specification 41-24**,** "Guidance for the design, installation, testing and maintenance of main earthing systems in substations" and Engineering Recommendation S.34, "A guide for assessing the rise of earth potential at substation sites". Additional requirements associated with **Generating Plant** are given in DPC7.

(b) The method of earthing of the **DNO's Distribution System**, for example, whether it is connected solidly to earth or through an impedance, shall be advised by the **DNO**. The specification of associated **Equipment** shall meet the voltages which will be imposed on the **Equipment** as a result of the method of earthing.

(c) Design practice for protective multiple earthing is detailed in the **Electricity Supply Industry (ESI)**engineering publications including Item 2 DGD Annex 1 Engineering Recommendation G12/4, "Application of protective multiple earthing to low voltage networks", and in the references contained in those publications.

(d) **Users** shall take precautions to limit the occurrence and effects of circulating currents in respect of the neutral points of any interconnected system (eg where there is more than one source of energy.)

DPC4.4.3 **Voltage Regulation and Control**

Any extension or connection to the **DNO's Distribution System** shall be designed in such a way that it does not adversely affect the voltage control employed by the **DNO's Distribution System**. Information on the voltage regulation and control arrangements will be made available by the **DNO** if requested by the **User.**

DPC4.4.4 **Protection**

(a) The **DNO's Distribution System** and the **System** of any **User** connected to the **DNO's Distribution System** shall incorporate protective devices in accordance with the requirements of the **ESQCR**.

(b) In order to ensure satisfactory operation of the **DNO's Distribution System**, **Protection** systems, operating times, discrimination, and sensitivity across the **Ownership Boundary**, as well as testing and maintenance regimes, shall be agreed between the **DNO** and the **User** during the application for connection process, and may be reviewed from time to time by the **DNO**, with the concurrence of the **User.**

(c) In order to cover a circuit breaker, or **Equipment** having a similar function, failing to operate correctly to interrupt fault current on a **HV System,** back-up protection by operation of other circuit breakers or **Equipment** having a similar function must normally be provided. The **DNO** will advise the **User** if the same is not required. If the **Equipment** providing the back-up protection is owned by the **DNO**, then this **Protection** may be limited to that needed to meet statutory requirements in respect of the **DNO's Distribution System**.

(d) Unless the **DNO** should advise otherwise, it is not acceptable for **Users** to limit the fault current infeed to the **DNO's Distribution System** by the use of **Protection** and associated **Equipment** if the failure of that **Protection** and associated **Equipment** to operate as intended in the event of a fault, could cause **Equipment** owned by the **DNO** to operate outside its short-circuit rating.

DPC4.4.5 **Superimposed Signals**

Where **Users** install mains borne signalling equipment it shall comply with BS EN50065 as amended from time to time. Where a **User** proposes to use such equipment to superimpose signals on the **DNO's Distribution System**, the prior agreement of the **DNO** is required.

DPC4.5 **Network Statements**

DPC4.5.1 In accordance with Condition 4 of its **Distribution Licence** the **DNO**, on the request of a **User,** will prepare a statement showing present and future circuit capacity, forecast power flows and loading on the part or parts of the **DNO's Distribution System** specified in the request and **Fault Levels** at each distribution node covered by the request and containing:

a) such further information as shall be reasonably necessary to enable such person to identify and evaluate the opportunities available when connecting to and making use of the part or parts of the licensee's distribution system specified in the request ;and

b) if so requested, a commentary prepared by the licensee indicating the licensee's views as to the suitability of the part or parts of the licensee's distribution system specified in the request for new connections and the distribution of further quantities of electricity..

The **Distribution Licence** sets out conditions on the time scales and charges associated with providing such a statement

DPC4.5.2 In accordance with Condition 25 of its Distribution Licence the **DNO** will prepare on the request of the **Authority** a statement, also known as the Long Term Development Statement. The form and content of this statement will be specified by the **Authority** and will cover future years on a rolling basis. This statement gives information to assist any person who contemplates entering into distribution arrangements with the **DNO** to identify and evaluate the opportunities for doing so.

DISTRIBUTION PLANNING AND CONNECTION CODE 5

DPC5 GENERAL REQUIREMENTS FOR CONNECTION

DPC5.1 Introduction

DPC5.1.1 **Distribution Planning and Connection Code** (DPC5) ensures that all **Users** of the **DNO's Distribution System** are subject to the same requirements for connection.

DPC5.1.2 Data exchange requirements specified in this **Distribution Planning and Connection Code** apply to any **User Development**, which has an impact on the **DNO's Distribution System.**

DPC5.1.3 DPC5.2.2 specifies the information required from **Users** by the **DNO** in order to ensure that adequate technical provision is made for new supplies or increases in existing load; DPC5.2.2 also applies to **Embedded Generators** who operate in parallel with the **DNO's Distribution System**, where a supply is required from the **DNO** under normal or emergency conditions. Information required from **Embedded Generators**, with connections at **HV** or **Low Voltage**, in respect of the import of energy to the **DNO's Distribution System**, is covered in DPC7. Transfer of Planning Data for **Users** connected at **HV** is set out in DPC 8.

DPC5.2 Declaration of Load Characteristics

DPC5.2.1 For supplies at **Low Voltage** under terms in the **Supply Agreement** it is possible in most cases to assess whether a proposed connection is acceptable, and to determine the necessary supply arrangements, from analysis of the following limited data:-

(a) Maximum power requirements (kVA or kW);

(b) Type and electrical loading of **Equipment** to be connected, eg number and size of motors, cookers, showers, space and water electrical heating arrangements, including details of equipment which is subject to switching by the **Supplier**; and

(c) The date when the connection is required.

These requirements will be specified on the appropriate application for a connection form obtainable from the **DNO**.

Should a preliminary examination of this data indicate that more detailed information is required then it shall be provided to the **DNO** upon request if reasonably required.

Users, shall contact the **DNO** in advance if it is proposed to make any significant change to the connection, electric lines or electrical **Equipment**, install or operate any generating equipment or do anything else that could affect the **DNO's Distribution System** or require alterations to the connection.

Users shall provide the **DNO** with any information it asks for about the nature, or use by the **User**, of electrical equipment on the **User's** premises (including that specified in DPC5.2.1 (a), (b), and (c) above). The **DNO** will only ask for information that is needed by it in relation to its **Distribution Licence** or the **Distribution Code** or to comply with the **ESQCR** or the **Act.**

DPC5.2.2 The provisions of DPC5.2.1 also apply to supplies other than those at **Low Voltage.** It may be necessary for the following more comprehensive information, in addition to that detailed in DPC5.2.1, to be provided on request:-

DPC5.2.2.1 **Standard Planning Data**

It is possible in most cases to assess whether a proposed connection is acceptable, and to determine the necessary supply arrangements, from analysis of the following limited **Planning Data** which will be specified on the appropriate standard application form obtainable from the **DNO**:

(a) Point of Connection to the **DNO's Distribution System** (geographical and electrical).

(b) The date when connection is required.

(c) Single line diagrams of existing and proposed arrangements of main **Plant** and **Apparatus** showing equipment rating.

(d) Type and electrical loading of equipment to be connected, eg number and size of motors, electrical heating arrangements, etc.

(e) Maximum power requirements MVA.

(f) Maximum **Active Power Demand** (MW).

(g) Maximum and minimum **Reactive Power** requirements (MVAr).

(h) The maximum **Phase (Voltage) Unbalance** which the **User** would expect the **Demand** to impose on the **DNO's Distribution System.**

(i) The maximum harmonic content which will be imposed on the **DNO's Distribution System.**

(j) Details of change of **Demand (Active Power** and **Reactive Power).**

(k) Details of any load management scheme to be applied by the **User** on the **User System**.

(l) **Peak Demand** profiles at the **Exit Point**, both 2 hourly on day of **User's Peak Demand** and monthly **Peak Demand** variations.

(m) Three phase short circuit infeed from all sources within the **User's System**, based on **Generation Set** sub-transient reactance and the minimum zero phase sequence impedance of the **User's System**.

(n) Standard load profiles

Should a preliminary examination of this data indicate that more detailed information is required then it shall be provided to the **DNO** on request.

DPC5.2.2.2 **Detailed Planning Data**

It may be necessary for the **User** in addition to that in DPC5.2.2.1, to provide the following more comprehensive **Detailed Planning Data** on request.

In relation to **Demand**:

(a) Type of load and control arrangements (eg controlled rectifier or large motor drives and type of starter employed).

(b) Maximum load on each phase at the time of **Peak Demand**

(c) **Demand** profiles (48 x half hour average estimates) for **Active** and **Reactive Power Demand** for the day of the **Exit Point Peak Demand** and for the day of the **National Electricity Transmission System Peak Demand** at **Annual Average Cold Spell (ACS) Conditions.**

In relation to fluctuating loads:-

(a) The rates of change of **Demand (Active Power** and **Reactive Power)** both increasing and decreasing.

(b) The shortest repetitive time interval between fluctuations in **Demand (Active Power** and **Reactive Power)**.

(c) The magnitude of the largest step changes in **Active Power** and **Reactive Power**, both increasing and decreasing.

In some cases, more detailed information may need to be provided to permit a full assessment of the effect of the **User's** load on the **DNO's Distribution System**. Such information may include an indication of the pattern of build up of load and a proposed commissioning programme. This information will be specifically requested by the **DNO** when necessary.

DPC5.2.3 A **DNO** is only entitled to use any information provided by a **User** under this **Distribution Code** for the purpose of fulfilling its obligations in respect of its **Distribution System** required by the **Distribution Licence** or the **Distribution Code**, including operating the procedures for **Load Managed Areas** and associated Security Restriction Notices specified in the **Distribution Use of System Agreement.**

DPC5.3 **Connection Arrangements**

DPC5.3.1 The design of connections between the **DNO's Distribution System** and **Users** shall be in accordance with the principles set out in DPC4, subject to any modification to which the **DNO** may reasonably consent.

DPC5.3.2 During the application for connection process the **DNO** will agree with the **User** the voltage level to which a **User** will be connected in accordance with its normal practice for the type of load to be supplied. The **DNO** may on occasion specify a different connection voltage from normal in order to avoid potential disturbance caused by the **User's Apparatus** to other **Users** of the **DNO's Distribution System** or for other technical reasons or may agree alternative methods for minimising the effects of disturbing loads.

DPC5.3.3 Before entering into a **Connection Agreement** and before making a connection to a **User** at a **Connection Point**, it will be necessary for the **DNO** to be reasonably satisfied that the **User's System** at the boundary with the **DNO's Distribution System** will comply with all appropriate requirements of the **Distribution Code.**

DPC5.3.4 The **User's** installation shall comply with the principles expected in Regulation 25(2)(a) of the **ESQCR,** or relevant European and British Standard as appropriate.

DPC5.4 **Ownership Boundaries**

DPC5.4.1 The point or points at which supply is given or taken between the **DNO's Distribution System** and **Users** will be agreed between the **DNO** and the **User** as required. For supplies at **Low Voltage** the general rule is that the point of supply will be at the outgoing (ie **User**'s side) terminals of the item of **DNO** or **Meter Operator** owned **Apparatus** where the transition is made to the **User**'s tails or other **User** owned **Apparatus**. For **HV** supplies, including connections between the **DNO** and **User**, and where necessary busbar connected supplies at **Low Voltage**, the points of supply will be subject to specific agreement between the parties in each case.

DPC5.4.2 The respective ownership of **Plant** or **Apparatus** will be recorded in a written agreement between the **DNO** and the **User** as required. In the absence of a separate agreement between the parties to the contrary, construction, commissioning, control, operation and maintenance responsibilities follow ownership.

DPC5.4.3 For supplies to **Embedded Generator**s who operate in parallel with the **DNO's Distribution System** and all supplies at **HV** the **DNO** will with the **User's** agreement prepare a **Site Responsibility Schedule** and, where determined by the **DNO** during the application for connection process, **Operation Diagrams** showing the agreed **Ownership Boundary**.

The **Site Responsibility Schedule** shall detail the demarcation of responsibility for safety of persons carrying out work or testing at sites having a **Connection Point** to the **DNO's Distribution System** and/or circuits which cross an **Ownership Boundary** at any point.

More detailed information on procedures and responsibilities involved in the provision of safety at interfaces between the **DNO's Distribution System** and a **User's System** is set out in **Distribution Operating Code** DOC8.

Copies of these documents will be retained by the **DNO** and the **User.** Changes in the boundary arrangements proposed by either party must be agreed in advance and will be recorded on the **DNO Operation Diagrams**.

DISTRIBUTION PLANNING AND CONNECTION CODE 6

DPC6 TECHNICAL REQUIREMENTS FOR CONNECTIONS

DPC6.1 Introduction

Distribution Planning and Connection Code DPC6 specifies the technical arrangements required at the **Ownership Boundary** between the **DNO's Distribution System** and the **System** of the **User** and is applicable at all voltage levels, but excludes **Users** (including those with **Unmetered Supplies)** connected at **Low Voltage**, without Generation, and protected by fuse(s) or other device(s) rated at 100 amps or less.

DPC6.2 Equipment at the Ownership Boundary

All **Equipment** at the **Ownership Boundary** shall meet the design principles contained within DPC4.4.1. Except in the case of the boundary between the **DNO** and an **Other Authorised Distributor**, connections for entry to and exit from the **DNO's Distribution System** shall incorporate a means of disconnection of the **User's** installation by the **DNO**. For the avoidance of doubt, this exemption does not apply at the interface between **DNO's Distribution System** and a multiple occupancy **Customer** premise.

DPC6.3 Protection Requirements

Protection requirements vary widely depending on established practices and the needs of the particular **DNO's Distribution System**. The basic requirement in all cases is that **Users'** arrangements for **Protection** at the **Ownership Boundary**, including types of **Equipment** and **Protection** settings, must be compatible with standards and practices on the **DNO's Distribution System**, maintaining necessary operating times, sensitivity, discrimination and co-ordination, as specified by the **DNO** during the application for connection process and which may be reviewed from time to time and complied with by the **User**.

In particular:-

(a) Maximum fault clearance times (from fault current inception to arc extinction) must be within the limits established by the **DNO** in accordance with **Protection** and **Equipment** short circuit rating policy adopted for the **DNO's Distribution System**.

(b) In connecting to the **DNO's Distribution System** the **User** should be aware that auto-reclosing or sequential switching features may be in use on the **DNO's Distribution System**. The **DNO** will on request provide details of the auto-reclosing or sequential switching features in order that the **User** may take this into account in the design of the **User System**, including **Protection** arrangements.

(c) **Users** should also be aware that the **Protection** arrangements on some **DNO's Distribution Systems** may cause disconnection of one phase or two phases only of a three phase supply for certain types of fault.

DPC6.4 Earthing

Earthing of that part of the **User's System** that is connected to the **DNO's Distribution System** shall comply with the arrangements specified in **DPC4**.

DPC6.5 **Fault Level Considerations**

DPC6.5.1 The short circuit rating of **User's Equipment** at the **Connection Point** should be not less than the design **Fault Level** of the **DNO's Distribution System** to which it is connected. The choice of **Equipment** for connection at **Low Voltage** may take into account attenuation in the service lines as specified in DGD Annex 1, Items 7 and 8, Engineering Recommendation P25, "The short circuit characteristics of electricity board's low voltage distribution networks and the co-ordination of overcurrent protective devices on 230V single phase supplies up to 100 Amps" and Engineering Recommendation P26/1, "The estimation of the maximum prospective short circuit current for three phase 415V supplies". The **DNO** in the design of its **System** will take into account the contribution to **Fault Level** of the **User's** connected **System** and **Apparatus**.

DPC6.5.2 In order to permit these assessments to be carried out information should be exchanged on prospective fault power infeed and X/R ratios where appropriate at points of entry to and exit from the **DNO's Distribution System.**

DPC6.6 **Capacitive and Inductive Effects**

The **User** shall, when applying to make a connection, provide the **DNO** with information as detailed in DPC8. Details will be required of capacitor banks and reactors connected at **HV** which could affect the **DNO's Distribution System** and which it is proposed to connect if agreed by the **DNO**. When requested by the **DNO** details shall also be provided of distributed circuit capacitance and inductance. Sufficient detail is required for the following:-

(a) To verify that controlling **Equipment** of the **DNO's Distribution System** is suitably rated.

(b) To show that the performance of the **DNO's Distribution System** will not be impaired.

(c) To ensure that arc suppression coils when used by the **DNO** for **System** earthing purposes are correctly installed and operated.

DPC6.7 **Communications and Telemetry Equipment**

DPC6.7.1 Where required by the **DNO** in order to ensure control of the **DNO's Distribution System,** communications between **Users** and the **DNO** shall be established in accordance with the following. **Users** shall provide and maintain those parts of the communications equipment within their location. Provision of any necessary communications requirements shall be in accordance with the **Connection Agreement** for a specific connection.

DPC6.7.2 **Primary Speech Facility**

Users at their own cost shall provide and maintain equipment approved by the **DNO** by means of which routine and emergency communications may be established between the **User** and the **DNO**.

Connection to the **DNO's** corporate telephone network and any circuit or circuits required to connect the **Users** with the point of connections shall be provided in accordance with the **Connection Agreement.**

The facilities to be provided by the connection and the signalling and logical requirements for the interface between the **Users** equipment and the connection to the **DNO's** corporate telephone network will be specified in the **Connection Agreement.**

DPC6.7.3 **Telemetry**

The **User** shall provide such voltage, current, frequency, **Active Power** and **Reactive Power** pulses and outputs and status points from his **System** as are considered reasonable by the **DNO** to ensure adequate **System** monitoring. The telemetry outstation in such a situation will be provided, installed and maintained by the **DNO**.

DPC6.7.4 **Telecontrol Outstation**

If it is agreed between the parties that the **DNO** shall control the switchgear on the **User's System**, the **DNO** shall install the necessary telecontrol outstation. Notwithstanding the above, it shall be the responsibility of the **User** to provide the necessary control interface for the switchgear of the **User** which is to be controlled.

DPC6.7.5 **Instructor Facilities**

Where required by the **DNO**, the **User** shall provide accommodation for special instructor facilities specified by **DNO** for the receipt of operational messages.

DPC6.7.6 **Data Entry Terminals**

The **User** shall accommodate the **DNO's** data entry terminals for the purpose of information exchange.

DPC6.7.7 **System Monitoring**

Monitoring equipment is provided on the **DNO's Distribution System** to enable the **DNO** to monitor dynamic performance conditions. Under the requirements of the **Grid Code**, **Generation Sets** and **Power Stations** will need to provide signals for monitoring purposes. Where this monitoring equipment requires input signals from the **User's** side of the **DNO/User Ownership Boundary**, the **User** shall be responsible for the provision of suitable signals in accordance with the **Connection Agreement.**

DISTRIBUTION PLANNING AND CONNECTION CODE 7

DPC7 REQUIREMENTS FOR EMBEDDED GENERATORS

DPC7.1 Introduction

DPC7.1.1 This **Distribution Planning and Connection Code** DPC7 is applicable to all **Embedded Generators** including a **Customer With Own Generation** and **Other Authorised Distributors,** having **Generating Plant** operating or capable of operating in parallel with the **DNO's Distribution System**.

DPC7.1.2 In addition to meeting the requirements of DPC7, **Embedded Generators** will need to meet the requirements of other relevant sections of the **Distribution Code**.

DPC7.1.3 For the avoidance of doubt a **User** who has installed a **Generation Set** in accordance with Item 13 DGD Annex 1 Engineering Recommendation G83 ("Recommendations For The Connection of Type Tested Small-Scale Embedded Generators (Up To 16 A Per Phase) in Parallel With Public Low-Voltage Distribution Networks") and where this is (are) their only **Generation Set(s)**, and which has been installed, commissioned and operated in accordance with Annex 1, Item 13, that **User** shall not be required to comply with the requirements of DPC7 in respect of that (those) **Generation Set.**

DPC7.1.4 Where **Generating Plant** is not intended for parallel operation, but where short term paralleling is desirable to avoid loss of supply during changeover, then the **Generating Plant** may be permitted to operate in parallel with the **DNO's Distribution System** for no more than 5 minutes in any month, and no more frequently than once per week. If the duration of parallel connection exceeds this period, or this frequency, then the **Generating Plant** must be considered as if it is, or can be, operated in long term parallel operation mode. An alternative frequency and duration may be agreed between the DNO and the **Generator**, taking account of particular site circumstances and **Generating Plant** design.

DPC7.1.5 Where DPC 7.1.4 applies, an electrical time interlock should be installed to ensure that the period of parallel operation does not exceed the agreed period. The timer should be a separate device from the changeover control system such that failure of the auto changeover system will not prevent the parallel being broken.

DPC7.2 General Requirements

DPC7.2.1 **Embedded Generators** connected to the **DNO's Distribution System**will comply with the requirements of Item 3, DGD Annex 1 Engineering Recommendation G59/3-3, "Recommendation for the connection of generating plant to the distribution systems of licensed distribution network operators".

DPC7.2.2 Every installation or network which includes **Generating Plant** operating in parallel with the **DNO's Distribution System** must include an **Isolating Device** capable of disconnecting the whole of the **Generating Plant** 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.

DPC7.2.4 To ensure that **DNO** staff and that of the **User** and the **User**'s contractors are aware of the presence of **Generating Plant**, appropriate warning labels should be used. Where the installation is connected to the **DNO's Distribution System** at **Low Voltage** the installer should generally provide labelling at the **Connection Point**, meter position, consumer's unit and at all points of isolation within the **User**'s premises to indicate the presence of **Generating Plant**. The labelling should be sufficiently robust and if necessary fixed in place to ensure that it remains legible and secure for the lifetime of the installation. The Health and Safety (Safety Signs & Signals) Regulations 1996 stipulates that labels should display the prescribed triangular shape, and size, using black on yellow colouring.

DPC7.2.5 The disconnection of **Generating Plant** must be achieved by the physical separation of mechanical contacts unless the disconnection is at **Low Voltage** and the equipment for achieving the disconnection contain appropriate self monitoring of the point of disconnection, in which case an appropriate electronic means such as a suitably rated semiconductor switching device would be acceptable.

DPC7.2.6 Where the **Connection Point** provided by the **DNO** for parallel operation is at **HV**, in addition to the provisions of DOC8, the **Generator** must ensure that a person with authority, or his staff, is available at all times to receive communications from the **DNO Control Person** so that emergencies, requiring urgent action by the **Generator**, can be dealt with adequately. Where required by the **DNO**, it will also be a duty of the **Generator**'s staff to advise the **DNO Control Person** of any abnormalities that occur on the **Generating Plant** which have caused, or might cause, disturbance to the **DNO's Distribution System**, for example earth faults.

DPC7.2.7 Manual synchronizing can only be done with the specific agreement of the **DNO**.

DPC7.2.8 The **DNO**'s interface circuit breaker will not be used for synchronizing, without the express agreement of the **DNO**.

DPC7.3 **Provision of Information**

Embedded Generators can have a significant effect on the **DNO's Distribution System** and as a result its **Users**. To enable the **DNO** to assess the impact **Embedded Generating Plant** or an **Embedded Transmission System** will have on the **DNO's Distribution System,** the **Embedded Generator** will be required to supply information to the **DNO.**

Embedded Generators shall provide the following minimum information to the **DNO** during the connection application process or otherwise as requested by the **DNO**:-

Relevant Sections:

(a)	**Power Station** and site data for all **Embedded Generators** excluding the **OTSO.**	DPC7.3.1 and Schedule 5a of the DDRC
(b)	**Generation Set** data for all **Embedded Generating Plant**	DPC7.3.2 and Schedule 5b of the DDRC
(c)	**Generation Set** data for specified types of **Embedded Generating Plant** 5c(i) Synchronous generators 5c(ii) Fixed speed induction generators 5c(iii) Double fed induction generators 5c(iv) Converter connected generators 5c(v) Transformers	DPC7.3.2 and Schedules 5c of the DDRC
(d)	**Generation Set** data for **Embedded Medium Power Station**s	DPC7.3.3 and Schedules 5c of the DDRC
(e)	**Embedded Transmission System** data	DPC7.3.1, DPC7.3.2 and DPC7.3.3 and Schedule 5e of DDRC

When applying for connection to the **DNO's Distribution System Embedded Generators** shall also refer to DPC5.

The **DNO** will use the information provided to model the **DNO's Distribution System** and to decide what method of connection will need to be employed and the voltage level to which the connection should be made. If the **DNO** reasonably concludes that the nature of the proposed connection or changes to an existing connection requires more detailed consideration then further information may be requested. It is unlikely that more information than that specified in DPC7.3.1 will be required for **Embedded Generators** who are to be connected at **Low Voltage** and have less than 50kVA in capacity, or connected at other than **Low Voltage** and have less than 300kVA in capacity.

DPC7.3.1 **Information Required from all Embedded Generators**

It will be necessary for each **Embedded Generator** to provide to the **DNO** information on physical and electrical characteristics of the **Power Station** and site as a whole as set out in Schedules 5a or 5e of the **Distribution Data Registration Code** before entering into an agreement to connect any **Generating Plant** or an **Embedded Transmission System** onto the **DNO's Distribution System:-**

The information required includes:

(a) Details of the proposed connection point (geographical and electrical) and connection voltage.

(b) The number and types of generators and the total capacity of the power station and auxiliary supplies under various operating conditions.

(c) Sketches of **System** Layout:

Operation Diagrams showing the electrical circuitry of the existing and proposed main features within the **User's System** and showing as appropriate busbar arrangements, phasing arrangements, earthing arrangements, switching facilities and operating voltages.

(d) Interface Arrangements

(i) The means of synchronisation between the **DNO** and **User**;

(ii) Details of arrangements for connecting with earth that part of the **Embedded Generator's System** directly connected to the **DNO's Distribution System**.

(iii) The means of connection and disconnection which are to be employed.

(iv) Precautions to be taken to ensure the continuance of safe conditions should any earthed neutral point of the **Embedded Generator's System** operated at **HV** become disconnected from earth.

More or less detailed information than that contained above might need to be provided, subject to the type and size of generation or the point at which connection is to be made to the **DNO's Distribution System**. This information will need to be provided by the **Embedded Generator** at the reasonable request of the **DNO**.

DPC7.3.2 **Additional Generation Set and Plant and Equipment Data Required from Embedded Generators.**

The **Standard Planning Data** and **Detailed Planning Data** specified in Schedule 5b and Schedule 5c (or Schedule 5e for the **OTSO**) of the **Distribution Data Registration Code** may be requested by the **DNO** from the **User** before entering into an agreement to connect any **Generating Plant** or **Embedded Transmission System** onto the **DNO's Distribution System.**

The information specified in Schedule 5b of the **Distribution Data Registration Code** includes generic data for all **Embedded Generation Sets.**

The information specified in Schedule 5c of the **Distribution Data Registration Code** includes the more detailed electrical parameters of individual **Generation Sets** and associated plant such as transformers, power factor correction equipment. The information required is classified as **Standard Planning Data** and **Detailed Planning Data** for each of the following categories of **Embedded Generation Set**:

(i) Synchronous generators

(ii) Fixed speed induction generators

(iii) Doubly fed induction generators

(iv) Series converter connected generators.

(v) Transformers

Under certain circumstances either more or less detailed information than that specified above might need to be provided and will be made available by the **Embedded Generator** at the request of the **DNO.**

DPC7.3.3 **Extra Information From Embedded Generators to be Provided to Meet Grid Code Requirements**

DPC 7.3.3(a) The **DNO** has an obligation under PC3.3 of the **Grid Code** to submit certain planning data relating to **Embedded Medium Power Stations** to **NGC**. The relevant data requirements of the **Grid Code** are also listed in PC3.3 of the **Grid Code**. It is incumbent on **Embedded Medium Power Stations** to provide this data listed in PC3.3 of the **Grid Code** to the **DNO**.

Where a **Generator** in respect of an **Embedded Power Station** is a party to the **CUSC** this DPC 7.3.3 will not apply.

DPC7.3.3(b) In addition to supplying the **DNO** with details of **Embedded Generating Plant** there is a requirement to provide information to **NGC** where it has been specifically requested by **NGC** in the circumstances provided for under the **Grid Code**.

DPC7.3.4 **Information Provided by the DNO to Users**

In accordance with Condition 4 and Condition 25 of its **Distribution Licence** the **DNO** is required to provide certain information to **Users** so that they have the opportunity to identify and evaluate opportunities to connect to the **DNO's Distribution System** as set out in DPC4.5**.** Comprehensive information on the **DNO's Distribution System** operating at 33kV and above is made available to **Users** through the Long Term Development Statements provided under Condition 25 of the **Distribution Licence.** Schedule 5d of the **Distribution Data Registration Code** is indicative of the type of network data the **DNOs** is required to provide to **Users** for identifying opportunities for connection of generation at voltages below 33kV. On the production of Schedule 5d data for a **User**, the **DNO** will update any relevant data that would otherwise be provided from the Long Term Development Statement.

DPC7.4 **Technical Requirements**

DPC7.4.1 **Generating Plant Performance Requirements**

DPC7.4.1.1 The requirements of this DPC7.4.1 do not apply to **Generation Sets** that are designed and installed for infrequent short term parallel operation only.

DPC7.4.1.2 For **Embedded Generating Plant,** which does not constitute or contain **BM Units** that are active (ie submitting bid-offer data) in the **Balancing Mechanism**, the electrical parameters required to be achieved at the **Generation Set** terminals are defined according to the connection method and will be specified by the **DNO** with the offer for connection. A **Generation Set** or **Power Station** must be capable of supplying its **Registered Capacity** within the **System Frequency** range 49.5 to 50.5 Hz. The output power should not be affected by voltage changes in the permitted operating range.

DPC7.4.1.3 In exceptional circumstances, the **Frequency** of the **DNO's Distribution System** could rise above 50.5 Hz or fall below 49.5 Hz. **Generation Sets** in **Embedded Small Power Stations** shall be capable of continuing to operate in parallel with the **DNO's Distribution System** in accordance with the following:

a.	47 Hz – 47.5 Hz	Operation for a period of at least 20 seconds is required each time the **Frequency** is within this range
b.	47.5 Hz – 51.5 Hz	Disconnection by overfrequency or underfrequency **Protection** is not permitted in this range
c.	51.5 Hz – 52 Hz	Operation for a period of at least 90 seconds is required each time the **Frequency** is within this range

DPC7.4.1.4 These **Frequency** operating range requirements also apply to **Generation Sets** in **Embedded Small Power Stations** already connected on or before 1 August 2010, unless the **Registered Capacity** of the **Embedded Small Power Station** is below 5 MW**.**

DPC7.4.1.5 For the avoidance of doubt, the above requirements do not preclude disconnection of **Generation Sets** by **Protection** agreed with the **DNO** or when necessary to protect **Plant** or **Apparatus** from being damaged

DPC7.4.1.6 **Embedded Medium Power Stations** additionally have to comply with DPC 7.5.

DPC7.4.2 **Control Arrangements**

DPC7.4.2.1 The **DNO** will specify in writing if a continuously acting fast response automatic excitation control system is required to control the **Generation Set** voltage without instability over the entire operating range of the **Generation Set** or **Power Station**. This will be dependent on the size and type of **Generating Plant** or **Power Station** and the adjacent part of the **DNO's Distribution System** to which it is connected.

DPC7.4.2.2 The **Generator** will notify, and keep notified, the **DNO** of the set points of the control scheme for voltage control or **Power Factor** control as appropriate and which have previously been agreed between the **Generator** and **DNO**. The information to be provided is detailed in Schedule 5a and Schedule 5b.

DPC7.4.3 Protection Requirements

DPC7.4.3.1 **Co-ordinating with Existing Protection**

It will be necessary for the **Protection** associated with **Embedded Generating Plant** and any **Embedded Transmission System** to co-ordinate with the **Protection** associated with the **DNO's Distribution System** as follows:-

(a) For **Generating Plant** and any **Embedded Transmission System** directly connected to the **DNO's Distribution System** the **Embedded Generator** must meet the target clearance times for fault current interchange with the **DNO's Distribution System** in order to reduce to a minimum the impact on the **DNO's Distribution System** of faults on circuits owned by **Embedded Generators** or on an **Embedded Transmission System**. The **DNO** will ensure that the **DNO Protection** settings meet its own target clearance times.

The target clearance times are measured from fault current inception to arc extinction and will be specified by the **DNO** to meet the requirements of the relevant part of the **Distribution System**.

(b) The settings of any **Protection** controlling a circuit breaker or the operating values of any automatic switching device at any point of connection with the **DNO's Distribution System**, as well as the **User's** maintenance and testing regime, shall be agreed between the **DNO** and the **User** in writing during the connection consultation process.

The **Protection** settings or operating values shall not be changed without the express agreement of the **DNO**.

(c) It will be necessary for the **Generating Plant Protection** and **Embedded Transmission System Protection** to co-ordinate with any auto-reclose policy specified by the **DNO**. In particular the **Generating Plant Protection** should detect a loss of mains situation and disconnect the **Generating Plant** in a time shorter than any auto reclose dead time. This should include an allowance for circuit breaker operation and generally a minimum of 0.5s should be allowed for this. For pole mounted auto-reclosers often set with a dead time of 1s, this implies a loss of mains response time of 0.5s. Similar response time is expected from under and over voltage relays.

DPC7.4.3.2 Specific **Protection** Required for**Embedded Generating Plant**

In addition to any **Protection** installed by the **Generator** to meet his own requirements and statutory obligations on him, the **Generator** must install **Protection** to achieve the following objectives:

i. For all **Generating Plant**:

a. To disconnect the **Generating Plant** from the **System** when a **System** abnormality occurs that results in an unacceptable deviation of the **Frequency** or voltage at the **Connection Point**;

b. To ensure the automatic disconnection of the **Generating Plant**, or where there is constant supervision of an installation, the operation of an alarm with an audio and visual indication, in the event of any failure of supplies to the protective equipment that would inhibit its correct operation.

ii. For polyphase **Generating Plant**

a. To inhibit connexion of **Generating Plant** to the **System** unless all phases of the **DNO's Distribution System** are present and within the agreed ranges of **Protection** settings;

b. To disconnect the **Generating Plant** from the **System** in the event of the loss of one or more phases of the **DNO's Distribution System**;

iii. For single phase **Generating Plant**

a. To inhibit connexion of **Generating Plant** to the **System** unless that phase of the **DNO's Distribution System** is present and within the agreed ranges of **Protection** settings;

b. To disconnect the **Generating Plant** from the **System** in the event of the loss of that phase of the **DNO's Distribution System**;

DPC7.4.3.3 Suitable **Protection** arrangements and settings will depend upon the particular **Generator**'s installation and the requirements of the **DNO's Distribution System**. These individual requirements must be ascertained in discussions with

the **DNO**. To achieve the objectives above, the **Protection** must include the detection of:

a. Over Voltage (O/V)

b. Under Voltage (U/V)

c. Over **Frequency** (O/F)

d. Under **Frequency** (U/F)

e. Loss of Mains (LoM)

There are different **Protection** settings dependent upon the **System** voltage at which the **Generating Plant** is connected (LV or HV) and also its size (eg **Small Power Station**, **Medium Power Station** and **Large Power Station**).

Protection settings for a **Large Power Station** and any connexion at 132kV must be considered on an individual basis and be consistent with **Grid Code** requirements. Loss of Mains protection will only be permitted at these sites if sanctioned by **NGC** – see DPC7.4.3.8 below.

For the purposes of DPC 7.4.3 the date of commissioning of **Generating Plant** is the date on which the tests required by DPC 7.4.9 have been complete to the **DNO**'s satisfaction.

DPC7.4.3.4 The following summarizes the required **Protection** settings that will generally be applied:

Prot Function	Small Power Station				Medium Power Station	
	LV Protection[$]		HV Protection[$]			
	Setting	Time	Setting	Time	Setting	Time
U/V st 1	Vφ-n[†] - 13% = 200.1V	2.5s*	Vφ-φ[‡] -13%	2.5s*	Vφ-φ[‡]- 20%	2.5s*
U/V st 2	Vφ-n[†] - 20% = 184.0V	0.5s	Vφ-φ[‡] - 20%	0.5s		
O/V st 1	Vφ-n[†] + 14% =262.2V	1.0s	Vφ-φ[‡] + 10%	1.0s	Vφ-φ[‡] + 10%	1.0s
O/V st 2	Vφ-n[†]+ 19% = 273.7V	0.5s	Vφ-φ[‡] + 13%	0.5s		
U/F st 1	47.5Hz	20s	47.5Hz	20s	47.5Hz	20s
U/F st 2	47Hz	0.5s	47Hz	0.5s	47Hz	0.5s
O/F st 1	51.5Hz	90s	51.5Hz	90s	52Hz	0.5s
O/F st 2	52 Hz	0.5s	52Hz	0.5s		

RoCoF[§] settings for Power Stations <5MW Registered Capacity		
Date of Commissioning	Asynchronous	Synchronous
Generating Plant Commissioned before 01/02/18	Not to be less than K2 x 0.125 Hz/s[#] and not to be greater than 1.0Hz/s[¶#], time delay 0.5s	Not to be less than K2 x 0.125 Hz/s[#] and not to be greater than 1.0Hz/s[¶#], time delay 0.5s
Generating Plant commissioned on or after 01/02/18	1.0Hz/s[¶#], time delay 0.5s	1.0Hz/s[¶#], time delay 0.5s

RoCoF§ settings for Power Stations ≥5MW Registered Capacity				
Date of Commissioning		Small Power Stations		Medium Power Stations
		Asynchronous	Synchronous	
Generating Plant Commissioned before 01/08/14	Settings permitted until 01/08/16	Not to be less than K2 x 0.125 Hz/s# and not to be greater than 1.0Hz/s¶#, time delay 0.5s	Not to be less than K2 x 0.125 Hz/s# and not to be greater than 0.5Hz/s¶# Ω, time delay 0.5s	Intertripping Expected
	Settings permitted on or after 01/08/16	1.0Hz/s¶#, time delay 0.5s	0.5Hz/s¶# Ω, time delay 0.5s	Intertripping expected
Generating Plant commissioned between 01/08/14 and 31/07/16		1.0Hz/s¶#, time delay 0.5s	0.5Hz/s¶# Ω, time delay 0.5s	Intertripping expected
Generating Plant commissioned on or after 01/08/16		1.0Hz/s¶#, time delay 0.5s	1.0Hz/s¶#, time delay 0.5s	Intertripping expected

Historic Vector Shift Settings			
Date of Commissioning	Small Power Stations		Medium Power Stations
	Asynchronous	Synchronous	
Settings permitted for **Generating Plant** commissioned before 01/02/18	K1 x 6 degrees	K1 x 6 degrees#	Intertripping Expected
Settings permitted for **Generating Plant** commissioned on or after 01/02/18	Vector Shift not allowed as LoM in these Power Stations		Intertripping Expected

Notes:

φ-n; φ-φ denote RMS phase to neutral and phase-phase values respectively of the voltage at the **Connection Point**

$ HV and LV Protection settings are to be applied according to the voltage reference at which the protection is measuring, ie:

- If the G59 protection takes its voltage reference from an LV source then LV protection settings shall be applied.
- If the G59 protection takes its voltage reference from an HV source then HV protection settings shall be applied.

†A value of 230V shall be used for all DNO LV systems

‡A value to suit the voltage of the connexion point

* Might need to be reduced if auto-reclose dead times are <3s

Intertripping may be considered as an alternative to the use of a Loss of Mains relay

K1 = 1.0 (for low impedance networks) or 1.66 – 2.0 (for high impedance networks)

K2 = 1.0 (for low impedance networks) or 1.6 (for high impedance networks)

§ Rate of change of frequency

¶ The required protection requirement is expressed in Hertz per second (Hz/s). The time delay should begin when the measured rate exceeds the threshold expressed in Hz/s and be reset if it falls below that threshold. The relay must not trip unless the measured rate remains above the threshold expressed in Hz/s continuously for 500ms. Setting the number of cycles on the relay used to calculate the RoCoF is not an acceptable implementation of the time delay since the relay would trip in less than 500ms if the rate was significantly higher than the threshold.

Ω The minimum setting is 0.5Hz/s. For overall system security reasons, settings closer to 1.0Hz/s are desirable, subject to the capability of the generating plant to work to higher settings.

DPC7.4.3.5 Any **Generating Plant** commissioned on or after 01/02/18 must not employ vector shift as a LoM technique. On or after 01/02/18 no **Generating Plant** may be retrofitted with vector shift as a LoM technique.

DPC7.4.3.6 Over and Under voltage **Protection** must operate independently for all phases in all cases.

DPC7.4.3.7 The settings in DPC7.4.3.4 apply to **Embedded Small Power Station**s and **Embedded Medium Power Station**s. In exceptional circumstances **Generator**s have the option to agree alternative settings with the **DNO** if there are valid justifications in that the **Generating Plant** may become unstable or suffer damage with the settings specified in DPC7.4.3.4. The agreed settings should be recorded in the **Connection Agreement**.

DPC7.4.3.8 The underfrequency and overfrequency **Protection** settings set out in DPC7.4.3.4 also apply to **Generation Sets** in **Embedded Small Power Stations** already existing on or before 1 August 2010 with a **Registered Capacity** at or above 5 MW**,** except where single stage **Frequency Protection** relays are used, in which case the following settings apply.

Protection Function	Setting	Time
U/F	47.5Hz	0.5 s
O/F	51.5Hz	0.5 s

In exceptional circumstances **Generator**s have the option to agree alternative settings with the **DNO** if there are valid justifications in that the **Generating Plant** may become unstable or suffer damage with the settings specified above. The agreed settings should be recorded in the **Connection Agreement**.

DPC7.4.3.9 A loss of mains **Protection** of the RoCoF type will generally be appropriate for **Small Power Station**s, but this type of loss of mains **Protection** must not be installed for **Power Station**s >50MW. In those cases where the **DNO** requires loss of mains **Protection** this must be provided by a means not susceptible to spurious or nuisance tripping, eg intertripping.

DPC7.4.3.10 Where short term paralleling in accordance with DPC7.1.4 is employed, the protection settings in the following table should be used in preference to those in DPC7.4.3.4.

Prot Function	Infrequent Short Term Parallel Operation			
	LV Protection		HV Protection	
	Setting	Time	Setting	Time
U/V	Vφ-n† - 10% (207V)	0.5s	Vφ-φ‡ -6%	0.5s
O/V	Vφ-n† + 14% 262.2V	0.5s	Vφ-φ‡ + 6%	0.5s
U/F	49.5Hz	0.5s	49.5Hz	0.5s
O/F	50.5Hz	0.5s	50.5Hz	0.5s

† A value of 230V shall be used in all cases for **DNO LV** systems

‡A value to suit the voltage of the **HV** connexion point

DPC7.4.4 **Fault Ride Through and Phase Voltage Unbalance**

Any **Generation Set** or **Power Station** connected to the **DNO's Distribution System,** where it has been agreed between the **DNO** and the **Generator** that the **Generator**'s **Power Station** will contribute to the **DNO's Distribution System** security, may be required to withstand, without tripping, the effects of a close up three phase fault and the **Phase (Voltage) Unbalance** imposed during the clearance of a close-up phase-to-phase fault , in both cases cleared by the DNO's main protection. The **DNO** will advise the **Embedded Generator** in each case of the likely tripping time of the **DNO's** protection, and for phase-phase faults, the likely value of **Phase (Voltage) Unbalance** during the fault clearance time.

In the case of phase to phase faults on the DNO's system that are cleared by **System** back-up **Protection** which will be within the **Plant** short time rating on the **DNO's Distribution System** the **DNO,** on request during the **Connection Agreement** process, will advise the **Embedded Generator** of the expected **Phase Voltage Unbalance**.

DPC7.4.5 **System Stability**

DPC7.4.5.1 The following requirements for system design within this DPC 7.4.5 will generally be applied by the **DNO** to **Power Station**s connected at 33kV and above. However there will be cases where the specific network conditions, including existing connected **Power Station**s, requires the **DNO** to apply these considerations at lower voltages.

DPC7.4.5.2 With the **System** in its normal operating state, it is desirable that all **Generation Set**s remain connected and stable for any of the following credible fault outages,

(a) any one single circuit overhead line, transformer feeder or cable circuit, independent of length,

(b) any one transformer or reactor,

(c) any single section of busbar at or nearest the point of connection where busbar protection with a total clearance time of less than 200ms is installed,

(d) if demand is to be secured under a second circuit outage as required by ER P2/6, fault outages (a) or (b), overlapping with any pre-existing first circuit outage, usually for maintenance purposes. In this case the combination of circuit outages considered should be that causing the most onerous conditions

for **System Stability**, taking account of the slowest combination of main protection, circuit breaker operating times and strength of the connections to the system remaining after the faulty circuit or circuits have been disconnected

DPC7.4.5.3 Any **Generation Set** that causes the **System** to become unstable under fault conditions must be rapidly disconnected to reduce the risk of **Plant** damage and disturbance to the **System**.

DPC7.4.6 **Neutral Earthing**

The winding configuration and method of earthing connection shall be agreed with the **DNO.**

In addition, where the **Generator**'s **Connection Point** is at **Low Voltage** the following shall apply

(a) Where an earthing terminal is provided by the **DNO** it may be used by a **Generator** for earthing the **Generating Plant**, provided the **DNO** earth connection is of adequate capacity. If the **Generating Plant** is intended to operate independently of the **DNO**'s supply, the **Generating Plant** must include an earthing system which does not rely upon the **DNO**'s earthing terminal. Where use of the **DNO**'s earthing terminal is retained, it must be connected to the **Generating Plant** earthing system by means of a conductor at least equivalent in size to that required to connect the **DNO**'s earthing terminal to the installation.

(b) Where the **Generating Plant** may be operated as a switched alternative only to the **DNO**'s **System**, the **Generator** shall provide an independent earth electrode.

(c) Where it is intended to operate in parallel with the **DNO**'s **Low Voltage System** with the star point connected to the neutral and/or earthing system, precautions will need to be taken to limit the effects of circulating harmonic currents. It is permissible to insert an impedance in the supply neutral of the **Generating Plant** for this purpose, for those periods when it is paralleled with the **DNO**'s **System**. However, if the **Generating Plant** is operating in isolation from the **DNO's Distribution System** it will be necessary to have the **Generating Plant** directly earthed.

(d) Where the **Generating Plant** is designed to operate independently from the **DNO's Distribution System** the switchgear that is used to separate the two **System**s shall break all four poles (3 phases and neutral). This prevents any phase or neutral current, produced by the **Generating Plant**, from flowing into the **DNO's Distribution System** when it operates as a switched alternative only supply

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 **Generating Plant** 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 **Generating Plant** 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 **Generating Plant** 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 **Generating Plant** in order to discharge the requirements of the **Distribution Code** and Annex 1, item 3 (ER G59/3-3). In general the **DNO** will witness these tests for **Generating Plant** connected to the **DNO's Distribution System** at **HV**. For **Generating Plant** 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**.

DPC7.5.3 Where data is required by **NGC** from **Medium Power Stations**, nothing in the **Grid Code** or **Distribution Code** precludes the **Generator** from providing the information directly to **NGC** in accordance with **Grid Code** requirements. However, a copy of the information should always be provided in parallel to the **DNO**.

DPC7.5.4 **Grid Code Connection Conditions Compliance**

DPC7.5.4.1 The technical designs and parameters of the **Embedded Medium Power Stations** will comply with the relevant Connection Conditions of the **Grid Code**. A statement to this effect, stating compliance with OC5.8 of the **Grid Code** is required to be presented to the **DNO**, for onward transmission to **NGC**, before commissioning of the **Power Station**. Note that the statement might need to be resubmitted post commissioning when assumed values etc have been confirmed.

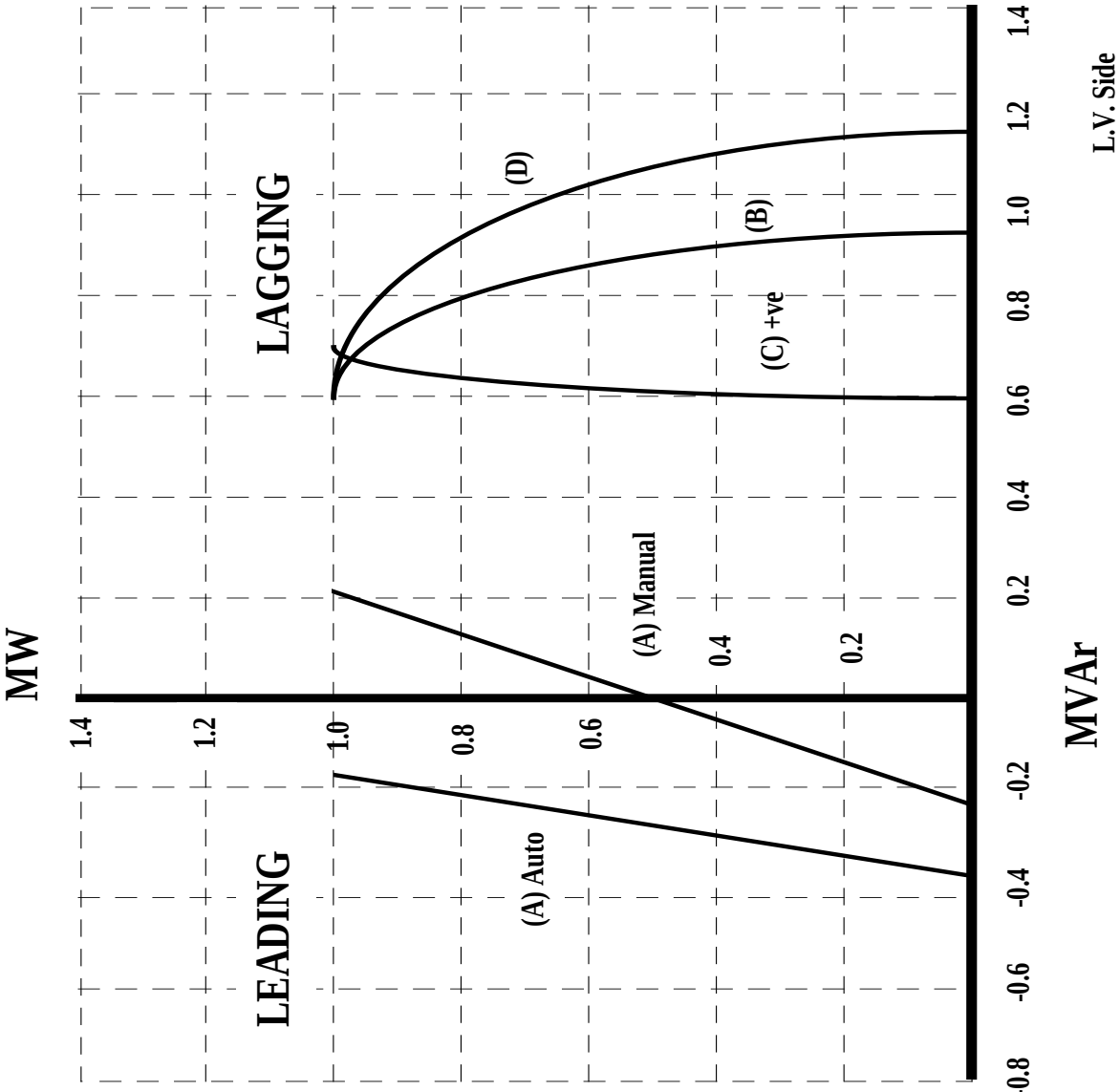
DPC7.5.4.2 Should the **Generator** make any material change to such designs or parameters as will have any effect on the statement of compliance referred to in DPC7.5.4.1, the **Generator** must notify the change to the **DNO**, as soon as reasonably practicable, who will in turn notify **NGC**.

DPC7.5.4.3 Tests to ensure **Grid Code** compliance may be specified by **NGC** in accordance with the **Grid Code**. It is the **Generator's** responsibility to carry out these tests

DPC7.5.4.4 Where NGC can reasonably demonstrate that for **Total System** stability issues the **Medium Power Station** should be fitted with a power system stabiliser, **NGC** will notify the **DNO** who will then require it to be fitted for compliance with this DPC7.5.4.4.

FIGURE 1

GENERATOR PERFORMANCE CHART



KEY:-

(A) Practical Stability Limit

(B) Rotor Heating Limit

(C) Transformer Tap Limit

(D) MVA Limit

GENERATOR
MW .....
MVA .....
pf .....
kV ..... (term)
X_d .....

TRANSFORMER
MVA .....
X_t .....

UNIT TRANSFORMER
MW Load .....
MVAr Load .....

SYSTEM VOLTAGE
kV ..... (nominal)
(P.U. Values)

Comments:- Operating chart confirmed by users.

DISTRIBUTION PLANNING AND CONNECTION CODE (DPC)

DISTRIBUTION PLANNING AND CONNECTION CODE 8

DPC8 TRANSFER OF PLANNING DATA

DPC8.1 **Introduction**

DPC8.1.1 **Distribution Planning and Connection Code** DPC8 details information to be exchanged between the **DNO** and **Users** that are connected at **High Voltage** including **Embedded Generators** and **Other Authorised Distributors**.

It includes data that is necessary in order for the **DNO's Distribution System** to be developed in an efficient, co-ordinated and economic manner, and to enable the **DNO** to comply with the conditions contained in its **Distribution Licence.**

DPC8.2 **Planning Information to be Provided by Users**

DPC8.2.1 Prospective and existing **Users** of the **DNO's Distribution System** must provide sufficient planning data/information as can reasonably be made available, when requested by the **DNO** from time to time to enable the **DNO** to comply with the requirements under its **Distribution Licence**. For those **Users** from whom **Demand** forecasts are required under **DOC1**, there will be a requirement to prepare an annual submission to the **DNO**. This submission, which is to be in accordance with **DOC1**, should include a development plan covering at least the subsequent 3 years and, where the **User** holds planning data or information relating to subsequent years up to 7 years ahead that data or information, including changes either increasing or decreasing in **Demand**, transfer requirements or generating capacity as appropriate.

DPC8.2.2 In addition to periodic updates of planning information a **User** should give adequate notice of any significant changes to the **User's System** or operating regime to enable the **DNO** to prepare its development plan, budget for, and implement any necessary **System** modifications. Such information should include any changes either increasing or decreasing in **Demand**, transfer requirements or generating capacity as appropriate. In the event of unplanned changes in a **User's System** or operating regime a **User** shall notify the **DNO** as soon as is practically possible to ensure any contingency measures, as necessary, can be implemented by the **DNO**.

DPC8.2.3 The **DNO** has an obligation under the **CUSC** to submit certain planning data/information relating to **Existing Offshore Generators** to **NGC**. Any **Existing Offshore Generators** will be required to cooperate with the **DNO** to contribute to the full and timely completion of the **Offshore Transmission Implementation Plan.**

DPC8.3 **Information to be Provided to Users**

DPC8.3.1 Where the **DNO** has received from a **User** any information or data under DPC8.3 or where the **DNO** proposes to make modifications to the **DNO's Distribution System** which, in either case, in the reasonable opinion of the **DNO**, may have an impact upon the **System** of any other **User,** the **DNO** will notify that **User** of the proposals subject to any constraints relating to the timing of release of information or confidentiality provisions.

DPC8.4 **Reactive Compensation Plant**

DPC8.4.1 A **User** shall provide the **DNO** with information on any reactive compensation **Plant** directly or indirectly connected to a **DNO's Distribution System**, other than at **Low Voltage**, including:-

(a) The MVAr capacitive or inductive rating of the **Equipment** and operating range if variable;

(b) Details of any automatic control logic such that the operating characteristics can be determined; and

(c) The point of connection to the **DNO's Distribution System**.

DPC8.5 **Lumped Network Susceptance**

DPC8.5.1 Under certain circumstances it will be necessary for the **User** to provide, at the request of the **DNO**, details of the equivalent lumped network susceptance at **Normal Frequency** of the **User's System** at nominal **Frequency** referred back to the connection with the **DNO's Distribution System**. This should include any shunt reactors which are an integrated part of a cable system and which are not normally in or out of service independent of the cable (ie. they are regarded as part of the cable).

DPC8.5.2 It should not include:-

(a) Independently switched reactive compensation plant connected to the **User's System** (covered in DPC8.4.1)

(b) Any susceptance of the **User's System** inherent in the **Reactive Power Demand**.

DPC8.6 **Short Circuit Infeed to the DNO's Distribution System**

DPC8.6.1 Information shall be exchanged between the **DNO** and the **User** on fault infeed levels at the point of connection with the **DNO's Distribution System** in the form of:-

(a) The maximum and minimum 3-phase symmetrical and phase earth short circuit infeed.

(b) The X/R ratio under short circuit conditions.

(c) In the case of interconnected **Systems**, adequate equivalent network information.

DPC8.7 **Interconnection Impedance**

DPC8.7.1 For **User** interconnections that operate in parallel with the **DNO's Distribution System** details of the interconnection impedance shall be exchanged between the **DNO** and the **User.** This information shall include an equivalent single impedance (resistance, reactance and shunt susceptance) of the parallel **User** or **DNO's Distribution System**.

DPC8.8 **Demand Transfer Capability**

DPC8.8.1 Information shall be exchanged on **Demand** transfer capability where the same **Demand** may be supplied from alternative **DNO** or **User** points of supply. This shall include the proportion of **Demand** normally fed from each point of supply and the arrangements (manual or automatic) for transfer under planned/fault outage conditions.

DPC8.9 **Other Authorised Distributor's Distribution System Data**

DPC8.9.1 **Other Authorised Distributors** shall provide the **DNO** with detailed data relating to the interface between their **Distribution System** and that of the **DNO**, covering circuit parameters, switchgear and **Protection** arrangements of equipment directly connected to or affecting the **Distribution System** to enable the **DNO** to assess any implications associated with these points of connection. Reciprocal arrangements will apply between the **DNO** and its **Users**.

DPC8.10 **Transient Overvoltage Effects**

DPC8.10.1 For **User's** busbars connected to the **DNO's Distribution System** sufficient details may need to be exchanged with respect to the **User/DNO Ownership Boundary** to enable an assessment, where necessary, of transient overvoltage effects to be made. This information may relate to physical and electrical layouts, parameters, specifications and **Protection** details.

DPC8.11 **More Detailed Information**

In certain circumstances more detailed information may be needed and will be provided upon the reasonable request of the **DNO**.

DISTRIBUTION OPERATING CODE (DOC)

DISTRIBUTION OPERATING CODE (DOC)

DISTRIBUTION OPERATING CODE 1

DOC1 DEMAND FORECASTS

DOC1.1 Introduction

DOC1.1.1 In order for the **DNO** to operate the **DNO's Distribution System** efficiently and to ensure maximum **System** security and **System Stability**, there is a need for those **Users** specified in DOC1.3 to provide loading and generation output information to the **DNO**.

DOC1.1.2 The **Grid Code** specifies **NGC's** requirements for **Demand** forecasting for **Generation Sets** which constitute or contain **BM Units** which are active (ie. submitting bid-offer data) in the **Balancing Mechanism**. This **Distribution Operating Code** DOC1 specifies the information to be provided by other **Generation Sets** and all **Users** of the **DNO's Distribution System** specified in DOC1.3 below.

DOC1.1.3 This **Demand** forecasting information is required to enable the **DNO** to maintain the integrity of the **DNO's Distribution System**. The **Licensee** under its **Distribution Licence** has an obligation under the **Grid Code** to provide **Demand** forecast information to **NGC** in order that generation output can be matched with **Demand**. The information, required to be provided by **Users** (specified in DOC1.3 below) under this **Distribution Operating Code,** will enable the **Licensee** to comply with these requirements of the **Grid Code**.

DOC1.1.4 Where **Demand** data is required from the **User,** this means the MW **Demand** of electricity at the **DNO** point of supply to the **User.** The **DNO** may, in certain cases, specify that the **Demand** data shall include the MVAr **Demand**.

DOC1.1.5 The information to be provided to the **DNO** shall be in writing as specified in DGD2 (vi).

DOC1.1.6 In this **Distribution Operating Code** Year 0 means the current calendar year at anytime, Year 1 means the next calendar year at anytime, Year 2 means the calendar year after Year 1, etc

DOC1.1.7 References in this **Distribution Operating Code** to data to be supplied on a half-hourly basis refers to it being supplied for each period of 30 minutes ending on the hour and half-hour in each day.

DOC1.2 Objectives

The objectives of this Distribution Operating Code **DOC1 are to**:-

(a) Set out the **Demand** forecast and **Embedded Generating Plant Output** or **Embedded Transmission System** output information required to be provided by **Users** to enable the **DNO** to operate the **DNO's Distribution System**.

(b) Specify the information required to be provided by **Users** to the **DNO** to enable it to comply with its obligations under the **Grid Code**.

DISTRIBUTION OPERATING CODE (DOC)

DOC1.3 **Scope**

This **Distribution Operating Code** applies to the following **Users** of the **DNO's Distribution Systems** which are connected at **HV**:-

(a) **Customers** with a **Demand** greater than 5 MW.

(b) **Embedded Generators** whose output is greater than 1MW where the **DNO** reasonably considers it appropriate.

(c) **Other Authorised Distributors** connected to the **DNO's Distribution System**.

(d) **Suppliers**, at the request of the **DNO**, on behalf of their **Customers**.

DOC1.4 **Information Flow and Co-ordination**

DOC1.4.1 **Demand Forecast Information**

The **DNO** will co-ordinate all **Demand** forecast information for each **Grid Supply Point** to meet the requirements of the **Grid Code**. The **DNO** will aggregate forecast information provided by **Users,** where appropriate, and provide forecast information to **NGC** where the **Demand,** or change in **Demand,** is equal to or greater than the **Demand Control Notification Level** at any **DNO Connection Point**.

DOC1.4.2 **Generation Output Information**

Information relating to **Generating Plant Embedded** in the **DNO's Distribution System** or in the network of an **Other Authorised Distributor or any Embedded Transmission System** shall, where specified be provided to the **DNO** in writing. A **Customer With Own Generation** may be required to furnish such information should the **DNO** reasonably consider that it would affect its **Demand** forecasts.

DOC1.4.3 **Information to be Provided by the DNO**

Where reference is made to "as specified by the **DNO"** or "the **National Electricity Transmission System** days or times of **Peak Demand** or minimum **Demand"**, the **DNO** will provide each **User**, from whom **Demand** forecasts are required, with such information.

DOC1.5 **Demand Forecast Data**

DOC1.5.1 **Planning Periods**

Information shall be supplied by **Users** to the **DNO** for the following rolling timescales is required by the **DNO**:-

(a) Operational Planning Phase – next three years ahead

(b) Programming Phase – 24 hours to 8 weeks ahead

(c) Control Phase – 0 to 24 hours ahead

The information supplied will be as specified below and as set out in the Schedules of the **Distribution Data Registration Code.**

DOC1.5.2 **Operational Planning Phase (next 3 years ahead).**

DOC1.5.2.1 The information required to be provided to the **DNO** during the **Operational Planning Phase** is specified in Appendix 1 of this **Distribution Operating Code**, DOC1.

DOC1.5.2.2 The information shall be provided to the **DNO** by Calendar week 35 each year.

DOC1.5.3 **Programming Phase (24 hours to 8 weeks ahead inclusive).**

DOC1.5.3.1 The information required to be provided by the **User** to the **DNO** during the **Programming Phase** is specified in Appendix 2 of this **Distribution Operating Code,** DOC1.

DOC1.5.3.2 For the period 2 to 8 weeks ahead the information shall be supplied to the **DNO** by 1600 hours each Friday.

DOC1.5.3.3 For the period 2 to 13 days ahead the information shall be updated and supplied to the **DNO** by 0900 hours each Wednesday.

DOC1.5.3.4 The **DNO** may require the information specified in Appendices 1 and 2 of this **Distribution Operating Code** to be updated if it reasonably considers it necessary and to be supplied to the **DNO** by 0800 hours each day (or such other time as specified by the **DNO** from time to time) for the next day (except that it may be for the next 3 days on Fridays and 2 days on Saturdays) and may be longer (as specified by the **DNO** at least one week in advance) to cover holiday periods.

DOC1.5.4 **Control Phase (0 to 24 hours ahead)**

The following information shall be supplied to the **DNO** at reasonable times to be specified by the **DNO** for the unexpired period covered by the **Control Phase:-**

(a) Details of any differences of greater than 5MW from the schedules of operation of any **Embedded Generating Plant** or **Embedded Transmission System** on a half hourly basis which were supplied under DOC1.5.3.3;

(b) Details from **Suppliers** of any differences of the amount and duration of their proposed use of **Customer Demand Control** aggregated to 5MW or more (averaged over any half-hour period) on a half-hourly basis which were supplied under DOC1.5.3.4.

(c) Details from each **User** connected to the **Distribution System** of any change in aggregated **Demand** at the point of supply of greater than 5MW of the **Demand**.

DOC1.5.5 **Post Control Phase**

The following shall be supplied to the **DNO** by 0300 hours each day:-

(a) Details of half-hour **Active Power** and **Reactive Power** output sent out to the **DNO's Distribution System** by **Embedded Generating Plant** or any **Embedded Transmission System** where the **DNO** reasonably considers it appropriate during the previous day on a half-hourly basis.

(b) **Suppliers**, and **Other Authorised Distributor** connected to the **DNO's Distribution System** will provide details of the amount and duration of **Demand Control** at the **DNO Connection Point** aggregated to 5MW or more (averaged over any half-hour) which was implemented during the previous **Operational Day**

DOC1.6 **Forecast Factors**

DOC1.6.1 The following factors will be taken into account by the **DNO** and **Users** when conducting **Demand** forecasts in the **Operational Planning Phase:-**

(a) Historic **Demand** data and trends.

(b) Weather forecasts (responsibility for weather correction of **User's Demand** rests with the **User.**)

(c) Incidence of major events or activities

(d) **Embedded Generation Set** or **Embedded Transmission System** Schedules.

(e) **Demand** transfers.

(f) Interconnection with adjacent **Other Authorised Distributors**.

(g) **Demand Control** proposed to be operated by **Suppliers.**

(h) Any other factor reasonably considered necessary.

DISTRIBUTION OPERATING CODE (DOC)

DISTRIBUTION OPERATING CODE 1

DOC 1 - APPENDIX 1

Demand Forecasts Operational Planning Phase (3 years ahead)

EACH CALENDAR YEAR BY WEEK 35:

For each of the next 3 years forecast information for:

(a) Half-hour **Active Power** and **Power Factor** (or **Reactive Power**) at **Annual ACS Conditions** for the specified time of the annual peak half-hour at the associated **Grid Supply Points** and at the specified time of the **National Electricity Transmission System Peak Demand**.

(b) Half-hour **Active Power** and **Power Factor** (or **Reactive Power**) at **Average Conditions** at the specified half-hour of the **National Electricity Transmission System** minimum **Demand**.

(c) Half-hour **Active Power** output of **Embedded Generating Plant** or any **Embedded Transmisison System** at the specified half-hour of the **National Electricity Transmission System Demand**.

In addition, where the loading or the generation output of a **User** may have a particular impact on the security or stability of the **System** then the **DNO** may on request require the following information from a **User**.

(a) **Weekly ACS Conditions** and **Average Conditions Active** and **Reactive Power Demand** at the time of the specified **National Electricity Transmission System Peak Demand** each week together with forecasts of **Demand** to be met and relieved by **Embedded Generating Plant Output** and planned **Demand Control** by other **Users.**

(b) **Weekly ACS Conditions Active** and **Reactive Power Demand** at the time of the specified **Grid Supply Point Peak Demand** each week.

This additional information will, where requested by the **DNO**, be updated throughout the current year (Year 0) in the **Programming Phase**, the times to be notified by the **DNO** where this is necessary.

Where reference is made to "specified" or **"National Electricity Transmission System Demand"**, the information will be provided by the **DNO** following the receipt of information provided by **NGC** in accordance with OC1 of the **Grid Code**.

DISTRIBUTION OPERATING CODE (DOC)

DOC 1 - APPENDIX 2

Demand forecasts - Programming Phase (24 hours to 8 weeks ahead inclusive)

The following information shall be provided to the **DNO** in the timescales specified in DOC1.5.3:-

(a) Schedules for the operation of **Embedded Generation Set** or any **Embedded Transmission System** whose output is greater than 1MW on a half-hourly basis where the **DNO** reasonably considers it appropriate

(b) From **Suppliers**, details of their proposed use of **Demand Control** measures aggregated to 5MW or more (averaged over any half-hour) on a half hourly basis for each of the **DNO's Connection Points**;

(c) From **Customers** and **Other Authorised Distributors** connected to the **DNO's Distribution System** whose operations are likely to result in an aggregated change in **Demand** at the **DNO's Connection Point** of supply of greater than 5MW of the **Demand** at that time on a half-hourly basis.

(d) Any other relevant **Demand** forecast information reasonably required by the **DNO**.

DISTRIBUTION OPERATING CODE (DOC)

DISTRIBUTION OPERATING CODE 2

DOC2 OPERATIONAL PLANNING

DOC2.1 **Introduction**

DOC2.1.1 **Operational Planning** within the terms of the **Distribution Code** comprises the co-ordination through various timescales, of planned outages of **Plant** and **Apparatus** which affect the **Operation** of the **DNO's Distribution System** or require the commitment of the **DNO's** resources.

DOC2.1.2 This **Distribution Operating Code** also enables the **DNO** to meet its **Distribution Licence** obligation to provide certain information specified in the **Grid Code** and establishes procedures to enable the collection of such data from **Users** specified in DOC2.3 below.

DOC2.1.3 Information to be provided to the **DNO** shall be in writing as specified in DGD2f).

DOC2.1.4 In order for the **DNO** to fulfil the requirements of this DOC2 it should be noted that the information set out in the **Grid Code** OC2, to be provided by **NGC**, will form the basis of **Operational Planning** under this DOC2.

DOC2.1.5 In this **Distribution Operating Code** Year 0 means the current calendar year at any time, Year 1 means the next calendar year at any time, Year 2 means the calendar year after Year 1, etc. Where Week 52 is specified read Week 53 in appropriate years.

DOC2.2 **Objectives**

The objectives of this **Distribution Operating Code** are:

(a) To set out the **DNO's Operational Planning** procedure and a typical timetable for the co-ordination of outage requirements of **Plant** and **Apparatus** to be provided by **Users** to enable the **DNO** to operate the **DNO's Distribution System.**

(b) To specify the information to be provided by **Users** to the **DNO** to enable the **DNO** to comply with its obligations under the **Grid Code**.

(c) To provide guidance for **High Voltage Customer** on how to comply with their obligations under Article 7 of the European Transparency Regulations (The European Commission Regulation No 543/2013) to provide information to **NGC** in their role as Transmission System Operator.

DOC2.3 **Scope**

This **Distribution Operating Code** applies to the **DNO** and the following **Users** of the **DNO's Distribution System** which are connected at **HV**:-

(a) **HV Customers** where the **DNO** considers it appropriate.

(b) **Customer With Own Generation** where the **DNO** reasonably considers it appropriate.

(c) **Embedded Generating Plant** in the **DNO's Distribution System** whose **Registered Capacity** is greater than 1MW and any **Embedded Transmission System** where the **DNO** reasonably considers it appropriate.

(d) Any **Other Authorised Distributor** connected to the **DNO's Distribution System**.

DOC2.4 **Information Flow and Co-ordination**

DOC2.4.1 **Embedded Generators**

Information relating to **Embedded Generating Plant** where the **DNO** reasonably considers it appropriate whose **Registered Capacity** is greater than 5MW, or 1MW in the case of renwable generating plant in Scotland and **Embedded Transmission System** shall where reasonably required by the **DNO** be provided by the **User** directly to the **DNO**. This may include a **Customer With Own Generation** where the **DNO** considers it appropriate.

DOC2.4.2 **High Voltage Customers**

In the event that:

a) a **High Voltage Customer** experiences the planned unavailability of its **Apparatus** resulting in the reduction of **Demand** of 100MW or more, or a change to the planned unavailability of its **Apparatus** resulting in a change in **Demand** of 100MW or more, for one settlement period or longer; or

b) a **High Voltage Customer** experiences a change in the actual availability of its **Apparatus** resulting in a change in **Demand** of 100MW or greater, such a **High Voltage Customer** shall provide **NGC** with the information required from a Non-Embedded Customer specified in **Grid Code** OC2.4.2.3 and **Grid Code** DRC Schedule 6 in a format and timescales agreed with **NGC**.

DOC 2.4.3 **Other Plant and Apparatus**

Information relating to all **Plant** and **Apparatus** connected to the **DNO's Distribution System**, or that which may affect its **Operation**, shall be co-ordinated with the **DNO**.

DOC2.5 **Timescales and Data**

DOC2.5.1 Detailed implementation of data gathering and timescales will be agreed between the **DNO** and each **User**. Due recognition will be given by the **DNO** to voltage levels and capacities of **Plant** and **Apparatus** when assessing information requirements.

DOC2.5.2 All information shall be provided in **Decimal Weeks** as a minimum, where Week 1 commences in the first week of January as published from time to time.

DOC2.5.3 The rolling timescales involved in **Distribution Operating Code** DOC2 are illustrated in Figure 1 of this **Distribution Operating Code** and are as follows:-

(a) **Operational Planning Phase**

Long Term Planning Phase - Calendar year 3 ahead.

Medium Term - Calendar years 1 and 2 ahead.

Short Term - The current calendar year 52 weeks ahead down to 9 weeks ahead.

(b) **Programming Phase**

24 hours to 8 weeks ahead inclusive

(c) **Control Phase**

0 to 24 hours ahead

DOC2.6 **Operational Planning**

DOC2.6.1 **Long Term Programme** (Calendar Year 3 ahead - Appendix 1).

DOC2.6.1.1 Each year, the **DNO** will prepare a Long Term Programme covering year 3 ahead which will include those **Distribution System** outages, **Embedded Transmission System** outages and **Embedded Generating Plant** outages, where the **DNO** reasonably considers it appropriate, which may affect the performance of the **Total System**.

DOC2.6.1.2 **Users** and **Embedded Generators** where the **DNO** reasonably considers it appropriate will provide the **DNO** with information in accordance with Appendix 1. This information will be requested by the **DNO** in order to satisfy the requirements of DOC2.6.1.1.

DOC2.6.2 **Medium Term Programme** (Calendar years 1 - 2 ahead Appendix 2)

DOC2.6.2.1 The previous Long Term Programme will be updated to form the basis of the Medium Term Programme. The availability of **Embedded Generating Plant** and any **Embedded Transmission System** will also be updated.

DOC2.6.2.2 **Users** and **Embedded Generators** will provide the **DNO** with information in accordance with Appendix 2.

DOC2.6.3 **Short Term Programme** (Current year 52 weeks ahead down to 9 weeks ahead - Appendix 3).

DOC2.6.3.1 The previous Medium Term Programme will be updated to form the basis of the Short Term Programme. The **DNO** will continually review this programme as necessary and periodically discuss it with the relevant parties as appropriate.

DOC2.6.3.2 It will take account of such review and discussions and any additional outages and the following further details of each outage proposed will be notified at this stage by the appropriate party:-

(a) Return to service times of circuits (if different from programme).

(b) Specific **Plant** and **Apparatus** to be worked upon.

(c) Any other information that may be reasonably specified by the **DNO** from time to time.

DOC2.6.3.3 At any time and from time to time during the current calendar year up to the **Programming Phase** (8 weeks ahead), **Users** may notify reasonable changes and additions to the outages previously notified during the Medium Term planning process. The **DNO** will consider whether the changes will adversely affect **System** security, stability or other parties, and will discuss with the party in question. Where the change is so discussed the **DNO** will inform the other affected **Users**.

DOC2.6.4 **Programming Phase** (24 hours to 8 weeks ahead inclusive)

DOC2.6.4.1 The Short Term Programme will form the basis of the **Programming Phase** and a rolling suggested programme for the following week and subsequent 7 week period respectively will be prepared weekly by the **DNO**.

DOC2.6.4.2 The **DNO** will update the programme each week and take account of any additional or varied outages.

DOC2.6.4.3 Any decision to depart from the outages and actions determined during this phase will immediately be notified to the **DNO**, who will inform other affected parties.

DOC2.6.5 **Generation Scheduling Information** (**Programming Phase** 24 hours to 8 weeks ahead inclusive).

DOC2.6.5.1 The **DNO** will obtain **Scheduling** information from **Embedded Generators** for **Embedded Generating Plant** and any **Embedded Transmission System** which do not constitute or contain **BM Units** which are active (ie submitting bid-offer data) where it considers it appropriate.

DOC2.6.5.2 The **Scheduling** information will specify the following on an individual **Generation Set** or **Embedded Transmission System** basis:

(a) The period the set or system is required.

(b) The planned half hourly output.

(c) Any other information the **DNO** reasonably considers necessary.

DOC2.6.6 **Control Phase** (0 to 24 hours ahead)

During the real time **Operation** any changes to the outage programme for the day shall be at the discretion of the **DNO**.

DOC2.7 **Nuclear Generating Plant**

DOC2.7.1 The **DNO** will endeavour to give as much notice as possible to a **Generator** with Nuclear **Generating Plant** which may be operationally affected by an outage which is to be included in a programme referred to in DOC2.6.4.1.

DOC2.7.2 Where a **Generator** with Nuclear **Generating Plant** which may be operationally affected by the **DNO's Distribution System** outage programme referred to in DOC2.6.4.1 (acting as a reasonable operator) is concerned on grounds relating to safety about the effect which an outage within such outage programme might have on one or more of its Nuclear **Generating Plant**, it may contact the **DNO** to explain its concerns and discuss whether there is an alternative way of taking that outage (having regard to technical feasibility). If there is such an alternative way, but the **DNO** refuses to adopt that alternative way in taking that outage, the **Generator** may involve the **Electricity Supply Industry (ESI)** disputes resolution procedure to decide on the way the outage should be taken. If there is no such alternative way, then the **DNO** may take the outage despite that **Generator's** concerns.

DISTRIBUTION OPERATING CODE (DOC)

DISTRIBUTION OPERATING CODE 2

DOC 2 - APPENDIX 1

OPERATIONAL PLANNING - LONG TERM PLANNING PHASE (YEAR 3 AHEAD)

The requirements of the Long Term Programme apply to Embedded Generating Plant and Embedded Transmission System connected to the DNO's Distribution System specified in DOC2.3.

EACH CALENDAR YEAR BY:-

WEEK 2 **Embedded Generators** provide the **DNO** with a provisional **Embedded Generating Plant** or **Embedded Transmission System** outage programme for Year 3 ahead specifying the **Generation Set** and MW concerned, the preferred date for each proposed outage, and where there is a possibility of flexibility, the earliest start date and latest finishing date where applicable.

WEEK 12 The **DNO** will provide the **Embedded Generators** with details of constraints on the **DNO's Distribution System** and potential **DNO's Distribution System** requirements during each week of Years 3 ahead for an outage together with their perceived **Output Usable** requirements for Year 3 ahead.

WEEK 25 **Embedded Generators** will provide the **DNO** with updated provisional **Embedded Generating Plant** or **Embedded Transmission System** outage programmes together with the **Registered Capacity** and neutral weekly **Output Usable** forecasts in both cases for Year 3 ahead.

WEEK 28 The **DNO** after discussion with the **Embedded Generator** will notify each **Embedded Generator** with details of any suggested revisions the **DNO** proposes to the provisional **Embedded Generating Plant** or **Embedded Transmission System** outage programme previously supplied and the reasons for such proposed revisions including such information as provided in week 12.

Users will provide the **DNO** with details of proposed outages in Year 3 ahead which may affect the performance of the **DNO's Distribution System**. This information need not be limited to **Plant Apparatus** and **System** at the **DNO** interface**.** Details will comprise general outage requirements, start and end dates.

WEEK 42 The **DNO** after discussions with the **Embedded Generator** will notify each **Embedded Generator** with details of any suggested revisions necessary to maintain **DNO System** security to the updated provisional **Embedded Generating Plant** or **Embedded Transmission System** outage programme previously supplied.

WEEK 43 Following consultation with **Users**, the **DNO** will include these outage proposals in the Long Term Programme.

DISTRIBUTION OPERATING CODE (DOC)

DISTRIBUTION OPERATING CODE 2

DOC 2 - APPENDIX 2

OPERATIONAL PLANNING - MEDIUM TERM PROGRAMME (YEARS 1 & 2)

The requirements of the Medium Term Programme apply to **Embedded Generating Plant and Embedded Transmission System** connected to the **DNO's Distribution System** as specified in DOC2.3.

EACH CALENDAR YEAR BY:-

WEEK 2 **Embedded Generators** not included in the Long Term Programme shall provide the **DNO** with a provisional **Embedded Generating Plant** or **Embedded Transmission System** outage programme for Years 1 and 2 specifying the **Generation Set** and MW concerned, the preferred date for each proposed outage, where applicable earliest start date and latest finishing date.

WEEK 10 **Embedded Generators** provide the **DNO** with estimates of **Output Usable** for each **Embedded Generating Plant** or **Embedded Transmission System** for Year 1 and 2 (weeks 1 to 52) and its proposed **Generation Set** and/or **System** outage programme for Years 1 and 2.

WEEK 12 The **DNO** will after discussion with the **Embedded Generator** provide the appropriate **Embedded Generator** with details of **DNO's Distribution System** constraints and potential **DNO's Distribution System** requirements during each week of Years 1 and 2 for an outage together with any suggested changes to its proposed **Generation Set** or **Embedded Transmission System** outage programme.

The **DNO** will notify each **Embedded Generator** of **Output Usable** requirements for Years 1 and 2 (weeks 1to 52).

WEEK 28 **Users** within the **DNO's** distribution services area will provide the **DNO** with details of outages due to take place during the Years 1 and 2 which may affect the performance of the **DNO's Distribution System**. This will comprise updating the programme for Years 3 ahead where appropriate and including any subsequent requests.

In addition to outage proposals, the programme shall include Trip Testing, Risks of Trip, and other information where known which may affect the security and stability of the **DNO's Distribution System**.

WEEK 41 Each **Embedded Generator** will provide the **DNO** with revised estimates of the **Output Usable** of each **Embedded Generating Plant** or **Embedded Transmission System** for Year 1 and 2 (weeks 1 to 52).

WEEK 48 Following consultation with **Users**, the **DNO** will include their proposals in the Medium Term Plan.

DISTRIBUTION OPERATING CODE (DOC)

DISTRIBUTION OPERATING CODE 2

DOC 2 - APPENDIX 3

OPERATIONAL PLANNING - SHORT TERM (CURRENT YEAR 52 WEEKS AHEAD DOWN TO 9 WEEKS AHEAD)

The Short Term Plan will be an update of the Medium Term Plan and comprise a receding period as the **Programming Phase** (24 hours to 8 weeks ahead inclusive) evolves through the current year.

EACH CALENDAR YEAR

WEEK 2 **Embedded Generators** not included in the Medium Term Plan will provide the **DNO** with a provisional **EmbeddedGenerating Plant** or **Embedded Transmission System** outage programme for the current calendar year specifying the **Embedded Generating Plant** or **Embedded Transmission System** and MW concerned, duration of the outage, earliest start date and latest finishing date where applicable. **Embedded Generators** will also provide the **DNO** with revised estimates of **Embedded Generating Plant** or **Embedded Transmission System Output Usable** for weeks 9 - 52.

WEEK 4 **DNO** will inform **Embedded Generators** of **Output Usable** requirements for weeks 9 - 52.

WEEK 10 **Embedded Generators** will provide the **DNO** with estimates of each **Embedded Generating Plant** or **Embedded Transmission System Output Usable** for weeks 18 - 52.

WEEK 12 The **DNO** will inform **Embedded Generators** of their desired changes **Embedded Generator** to **Output Usable** requirements for weeks 18 - 52 and will provide details of **DNO's Distribution System** constraints and **DNO's Distribution System** requirements.

WEEK 25 **Embedded Generators** will provide the **DNO** with estimates of each **Embedded Generating Plant** or **Embedded Transmission System Output Usable** for weeks 28 - 52.

WEEK 27 The **DNO** will inform **Embedded Generators** of changes to **Output Usable** requirements for weeks 31 - 52.

WEEK 41 **Embedded Generators** will provide the **DNO** with estimates of each **Embedded Generating Plant** or **Embedded Transmission System Output Usable** for weeks 44 - 52.

WEEK 43 The **DNO** will inform **Embedded Generators** of changes to **Output Usable** requirements for weeks 44 - 52.

An update of **Users** proposals agreed in the Medium Term Plan will be included in the Short Term Programming Phase.

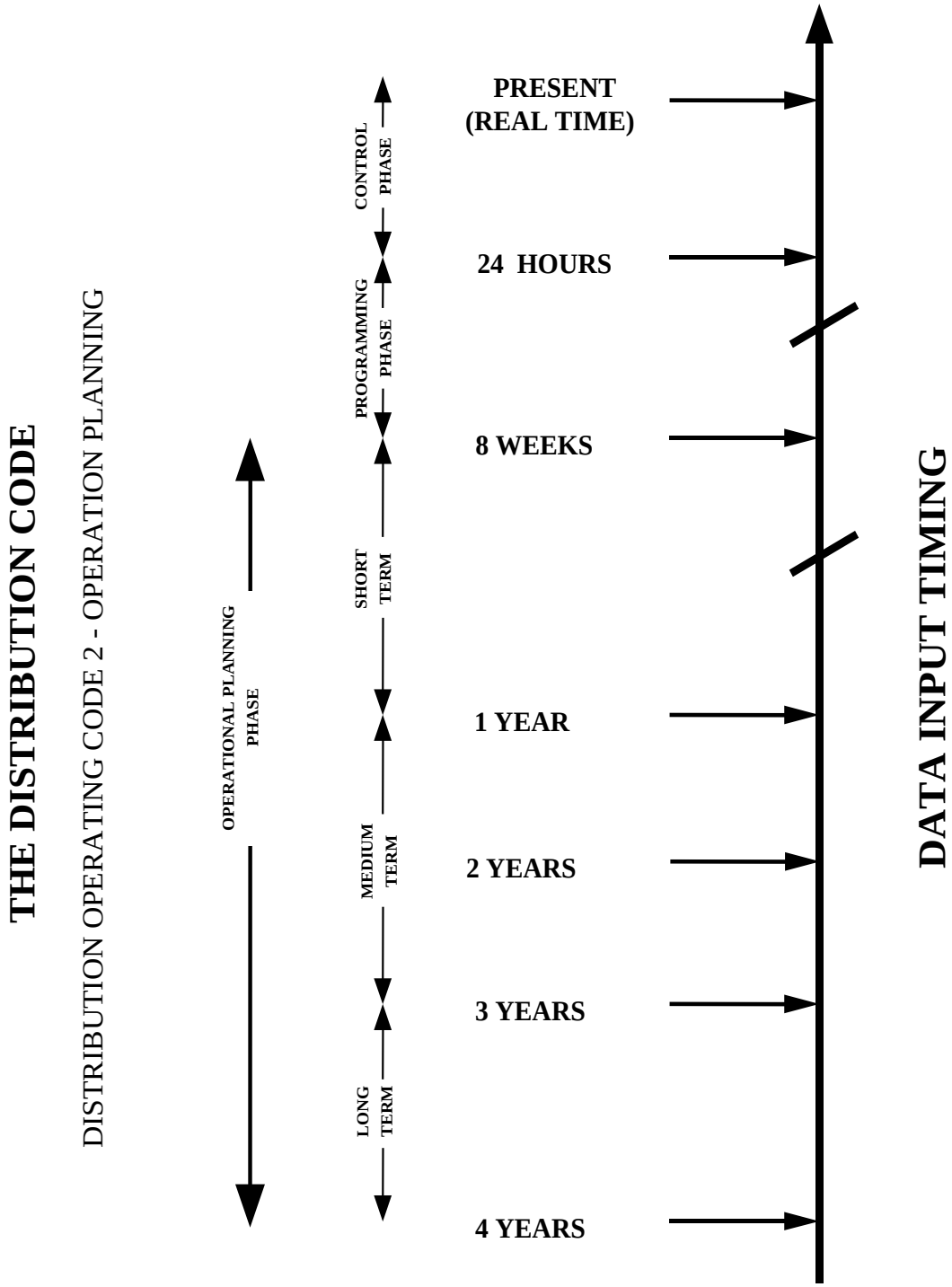

THE DISTRIBUTION CODE
DISTRIBUTION OPERATING CODE 2 - OPERATION PLANNING
OPERATIONAL PLANNING PHASE
CONTROL PHASE
PROGRAMMING PHASE
SHORT TERM
MEDIUM TERM
LONG TERM
PRESENT (REAL TIME)
24 HOURS
8 WEEKS
1 YEAR
2 YEARS
3 YEARS
4 YEARS
DATA INPUT TIMING

Figure 1

DISTRIBUTION OPERATING CODE (DOC)

DISTRIBUTION OPERATING CODE 5

DOC5 TESTING AND MONITORING

DOC5.1 Introduction

DOC5.1.1 To ensure that the **DNO's Distribution System** is operated efficiently and within its licence standards and to meet statutory actions the **DNO** will organise and carry out testing and/or monitoring of the effect of **Users**' electrical apparatus on the **DNO's Distribution System**.

DOC5.1.2 The testing and/or monitoring procedures will be specifically related to the technical criteria detailed in the **Distribution Planning and Connection Code**. They will also relate to the parameters submitted by **Users** in the **Distribution Data Registration Code.** Such testing can also be initiated on request from the **User** for the purpose of the **User** ensuring compliance with the above technical criteria.

DOC5.1.3 This DOC5 also covers the testing requirements that might be imposed from time to time on **Embedded Medium Power Stations** owned by a **Generator** who is not party to the **CUSC**

DOC5.1.4 The testing carried out under this **Distribution Operating Code** (DOC5) should not be confused with the more extensive **System Test** outlined in DOC12.

DOC5.2 Objective

DOC5.2.1 The objective of this **Distribution Operating Code** is to specify the **DNO's** requirement to test and/or monitor its **DNO's Distribution System** to ensure that **Users** are not operating outside the technical parameters required by the **Distribution Planning and Connection Code** and/or the **Distribution Operating Codes**.

DOC5.3 Scope

DOC5.3.1 This Distribution Operating Code applies to the following **Users** of the **DNO's Distribution System**:-

(a) **Customers** (it is not intended that the **Distribution Code** will necessarily apply to small **Customers** individually - their obligations will generally be dealt with on their behalf by their **Supplier**).

(b) **Embedded Generators.**

(c) **Other Authorised Distributor** connected to the **DNO's Distribution System.**

(d) **Suppliers**.

(e) **Meter Operators.**

DOC5.4 Procedure Related to Quality of Supply

DOC5.4.1 The **DNO** will from time to time determine the need to test and/or monitor the quality of supply at various points on its **DNO's Distribution System**.

DOC5.4.2 The requirement for specific testing and/or monitoring may be initiated by the receipt of complaints as to the quality of supply on the **DNO's Distribution System**.

DOC5.4.3 In certain situations the **DNO** may require the testing and/or monitoring to take place at the point of connection of a **User** with the **DNO's Distribution System**.

DOC5.4.4 Where testing and/or monitoring is required at the **Connection Point**, the **DNO** will advise the **User** involved and will make available the results of such tests to the **User**.

DOC5.4.5 Where the results of such tests show that the **User** is operating outside the technical parameters specified in the **Distribution Planning and Connection Code**, the **User** will be informed accordingly.

DOC5.4.6 Where the **User** requests, a retest will be carried out and the test witnessed by a **User** representative.

DOC5.4.7 A **User** shown to be operating outside the limits specified in **Distribution Planning and Connection Code** will rectify the situation or disconnect the **Apparatus** causing the problem from its electrical **System** connected to the **DNO's Distribution System** immediately or within such time as is agreed with the **DNO**.

DOC5.4.8 Continued failure to rectify the situation will result in the **User** being disconnected or de-energised in accordance with the **Connection Agreement** from the **DNO's Distribution System** either as a breach of the **Distribution Code** or through the authority of the **ESQCR**, where appropriate.

DOC5.5 **Procedure Related to Connection Point Parameters**

DOC5.5.1 The **DNO** from time to time will monitor the effect of the **User** on the **DNO's Distribution System**.

DOC5.5.2 The monitoring will normally be related to amount of **Active Power** and **Reactive Power** transferred across the **Connection Point**.

DOC5.5.3 Where the **User** is exporting to or importing from the **DNO's Distribution System Active Power** and **Reactive Power** in excess of the parameters in the **Connection Agreement** the **DNO** will inform the **User** and where appropriate demonstrate the results of such monitoring.

DOC5.5.4 The **User** may request technical information on the method of monitoring and, if necessary, request another method reasonably acceptable to the **DNO**.

DOC5.5.5 Where the **User** is operating outside the specified parameters, the **User** will immediately restrict the **Active Power** and **Reactive Power** transfers to within the specified parameters.

DOC5.5.6 Where the **User** requires increased **Active Power** and **Reactive Power** in excess of the physical capacity of the **Connection Point** the **User** will restrict power transfers to those specified in the **Connection Agreement** until a modified **Connection Agreement** has been applied for from the **DNO** and physically established.

DOC5.6 Grid Code Compliance for Medium Power Stations not subject to an embedded generation agreement

DOC5.6.1 Procedure For Compliance

DOC5.6.1.1 **NGC** may, from time to time, but generally not more than twice in any calendar year, request that the **DNO** procure from the **Generator** a statement confirming compliance with the relevant **Grid Code** Connection Conditions at the **Embedded Medium Power Station** not subject to an embedded generation agreement in question. Such requests will generally, but not necessarily, be contingent on the issues raised in DOC6.5.3.3 below.

DOC5.6.1.2 On request from the **DNO**, in furtherance of DOC5.6.1.1 above or at other times not generally more than twice per calendar year, the **Generator** will provide to the **DNO** a statement with appropriate supporting evidence of compliance with the relevant **Grid Code** requirements. The **DNO** will immediately submit this information to **NGC**. The **Generator** is at liberty to submit the data directly to **NGC**, but a copy must be submitted in parallel to the **DNO**.

DOC5.6.1.3 In the event that in **NGC's** view an **Embedded Medium Power Station** fails persistently to comply with the **Grid Code** Connection Conditions **NGC** shall notify the **DNO** giving details of the failure and of the monitoring that **NGC** has carried out.

DOC5.6.1.4 The **DNO** will notify the **Generator** responsible for the **Embedded Medium Power Station** in question as soon as possible, and in any case within 2 working days of all the facts contained in the **NGC** notice.

DOC5.6.1.5 The **Generator** responsible for the **Embedded Medium Power Station** in question will, as soon as possible, provide the **DNO** with an explanation of the reasons for the failure and details of the action that it proposes to take to comply with the **Grid Code** Connections Conditions within a reasonable period.

DOC 5.6.1.6 **NGC**, the **DNO** and the **Generator** will then discuss the action the **Generator** proposes to take and will endeavour to reach agreement as to:

(a) any short term operational measures necessary to protect other **Users**; and

(b) the parameters which are to be submitted for the **Generation Set** and the effective date(s) for the application of the agreed parameters.

DOC5.6.2 Procedure for Testing

DOC5.6.2.1 Subject to the provisions of DOC5.6.1 should the **DNO** fail to procure a notice of compliance to **NGC's** reasonable satisfaction**, NGC** may at any time (although not normally more than twice in any calendar year in respect of any particular **Embedded Medium Power Station** not subject to an embedded generation agreement issue an instruction requiring the **DNO** to facilitate a test, provided **NGC** has reasonable grounds of justification based upon:

(a) a submission of data in respect of the relevant **Embedded Medium Power Station** indicating a change in performance; or

(b) a statement from the **DNO** or **Generator** indicating a change in performance; or

(c) monitoring by **NGC**, whether or not carried out in accordance with DOC5.6.1.3 above; or

(d) notification from the **DNO** of completion of an agreed action from DOC5.6.1 above.

DOC5.6.2.2 The test referred to in DOC5.6.2.1 on any one or more of the **Generation Sets** comprising part of the relevant **Embedded Medium Power Station** should only be to demonstrate that:

(a) the relevant **Generation Set** meets the requirements of the paragraphs in the **Grid Code** Connection Conditions which are applicable to such **Generation Sets** or **Power Station**; or

(b) the relevant **Generation Set** meets the requirements for operation in **Limited Frequency Sensitive Mode** in accordance with CC.6.3.3, BC3.5.2 and BC3.7.2,

DOC5.6.2.3 The instruction referred to in DOC5.6.2.1 may only be issued where, following consultation and the preparation of a mutually agreed testing plan (to include prevailing economic conditions etc) and timetable between the **DNO**, **Generator** and **NGC**, **NGC** has:

(a) confirmed to the **DNO** and **Generator** the manner in which the test will be conducted, which shall be consistent with the principles established in DOC5.6.3; and

(b) received confirmation from the **DNO** that the relevant **Generation Set** would not then be unavailable by reason of forced outage or **Planned Outage** expected prior to the instruction.

DOC5.6.3 Conduct of Test

DOC5.6.3.1 The **Generator** is responsible for carrying out the test when requested by the **DNO** following a valid request from **NGC** in accordance with DOC5.6.2.1 and the **Generator** retains the responsibility for the safety of personnel and plant during the test.

DOC5.6.3.2 The performance of the **Generation Set** concerned will be recorded at **NGC** and/or **DNO Control Centres** with monitoring at site as and when necessary during the test.

DOC5.6.3.3 If monitoring at site is undertaken, the performance of the **Generation Set** will be recorded on a suitable recorder (with measurements taken as appropriate on the **Generation Set** Stator Terminals / on the LV side of the generator transformer) in the relevant **User's Control Centre**, in the presence of a reasonable number of representatives appointed and authorised by **NGC**. If **NGC** or the **DNO** or the **Generator** requests, monitoring at site will include measurement of the following parameters during the test.:

(a) for Steam Turbines: governor pilot oil pressure, valve position and steam pressure; or

(b) for Gas Turbines: Inlet Guide Vane position, Fuel Valve positions, Fuel Demand signal and Exhaust Gas temperature; or

(c) for Hydro Turbines: Governor Demand signal, Actuator Output signal, Guide Vane position; and/or

(d) for Excitation Systems: Generator Field Voltage and Power System Stabiliser signal where appropriate.

DOC5.6.3.4 The relevant test parameters and the pass/fail criteria shall be drawn from Section OC5.5.3 of the **Grid Code**.

DOC5.6.4 Test Failure/Re-test

DOC5.6.4.1 If the **Generation Set** concerned fails to pass the test the **Generator** must provide the **DNO** and **NGC** with a written report specifying in reasonable detail the reasons for any failure of the test so far as they are then known to the **Generator** after due and careful enquiry.

DOC5.6.4.2 The **DNO** has the responsibility under the **Grid Code** to forward the report of DOC5.6.4.1 above to **NGC.** This report must be provided within five Business Days of the test. If a dispute arises relating to the failure, **NGC**, the **DNO** and the **Generator** shall seek to resolve the dispute by discussion, and, if they fail to reach agreement, either of the **DNO** or **Generator** may by notice respectively:

(a) require **NGC** to initiate a re-test on 48 hours' notice which shall be carried out following the procedure set out in OC5.5.2 and OC5.5.3 and subject as provided in OC5.5.1.3, as if **NGC** had issued an instruction at the time of notice from the relevant **User**; or

(b) confirm that it (or they) will exercise its right to carry out a re-test on 48 hours' notice which shall be carried out following the procedure set out in **Grid Code** Sections OC5.5.2 and OC5.5.3 and subject as provided in **Grid Code** Sections OC5.5.1.6, as if **NGC** had issued an instruction at the time of notice from the **DNO**.

DOC5.6.5 Dispute following Re-test

DOC5.6.5.1 If the **Generation Set** in **NGC's** view fails to pass the re-test and a dispute arises on that re-test, **NGC**, the **DNO** and the **Generator** may use the **CUSC Disputes Resolution Procedure**, (which embodies the ESI disputes resolution procedure) for a ruling in relation to the dispute, which ruling shall be binding.

DOC5.6.6 Dispute Resolution

DOC5.6.6.1 If following the procedure set out in DOC5.6.5 it is accepted that the **Generation Set** has failed the test or re-test (as applicable), the **Generator** shall within 14 days, or such longer period as **NGC** may reasonably agree, following such failure, submit in writing to the **DNO** for submission to **NGC** for approval the date and time by which the **Generator** shall have brought the **Generation Set** concerned to a condition where it complies with the relevant requirement.

DOC5.6.6.2 Should **NGC** not approve the **Generator's,** proposed date or time (or any revised proposal), the **Generator** shall amend such proposal having regard to any comments **NGC** and/or **the DNO** may have made and re-submit it for approval.

DOC5.6.6.3 If the **Generation Set** fails the test the **Generator** shall resubmit to the **DNO** the relevant registered parameters of that **Generation Set** for the period of time until the **Generation Set** can achieve the parameters previously registered, as demonstrated (if required by **NGC** in accordance with DOC5.6.6.4) in a re-test. The **DNO** will submit these parameters to **NGC** as required by the **Grid Code**.

DOC5.6.6.4 Once the **Generator,** has indicated to **NGC** via the **DNO** the date and time that the **Generation Set** can achieve the parameters previously registered or submitted, **NGC** shall either accept this information or require the **Generator** to demonstrate the restoration of the capability by means of a repetition of the test referred to in DOC5.6.7 by an instruction requiring the **DNO** to ensure on 48 hours' notice that such a test is carried out by the **Generator**.

DOC5.6.6.5 The provisions of this DOC5.6.6 will apply to such further test.

DISTRIBUTION OPERATING CODE (DOC)

DISTRIBUTION OPERATING CODE 6

DOC6 DEMAND CONTROL

DOC6.1 Introduction

DOC6.1.1 This **Distribution Operating Code** DOC6 is concerned with the provisions to be made by the **DNO** and **Users** with **Systems** connected to the **DNO's Distribution System** in certain circumstances, to permit reductions in **Demand** in the event of insufficient **Generating Plant,** and transfers from **External Interconnections** being available to meet **Demand** or to avoid disconnection of **Customers** or in the event of breakdown and/or operating problems (such as in respect of **System Frequency**, **System** voltage levels or **System** thermal overloads)_on any part of the **National Electricity Transmission System** and/or the **DNO's Distribution System**.

DOC6.1.2 This **Distribution Operating Code** deals with the following methods of **Demand Control**:-

(a) **Customer Demand** reduction, including **Voltage Reduction**, initiated by the **DNO**.

(b) **Customer Demand** reduction instructed by **NGC**.

(c) Automatic low frequency **Demand** disconnection.

(d) Emergency manual **Demand** disconnection.

The term "Demand Control" is used to describe any or all of these methods of achieving a Demand reduction.

Data relating to Demand Control should be expressed in MW.

DOC6.1.3 The situation where it is necessary to reduce **Demand** due to Civil Emergencies is dealt with in **Distribution Operating Code**, DOC9.

The Electricity Supply Emergency Code issued by the lead government department for energy emergencies (as amended from time to time) provides that in certain circumstances consumers are given a certain degree of "protection" when rota disconnections are implemented pursuant to a direction under the Energy Act 1976. No such protection can be given under the **Grid Code** or this section of the **Distribution Code.**

DOC6.1.4 Connections between **Power Stations** comprising **Generation Set(s)** which comprise or contain **BM Units** which are active (ie. submitting bid-offer data) in the **Balancing Mechanism** and a **DNO's Distribution System** will not, as far as is possible, be disconnected by a **DNO** pursuant to the provisions of DOC6 insofar as that would interrupt supplies.

(a) For the purpose of operation of the **Power Station** (including start-up and shutting down).

(b) For the purposes of keeping the **Power Station** in a state that it could be started-up when it is off–load for ordinary operational reasons.

(c) For the purpose of compliance with the requirements of a Nuclear Site Licence.

Demand Control pursuant to this **DOC6** therefore applies subject to this exception.

DOC6.1.5 The control of **Demand Control** between the **DNO's Distribution System** and the **National Electricity Transmission System** will be carried out in accordance with Operating Code of the **Grid Code** and is outwith the scope of this **Distribution Operating Code**.

DOC6.2 **Objective**

To establish procedures to enable the **DNO**, following an instruction of **NGC** or otherwise, to achieve reduction in **Demand** that will either avoid or relieve operating problems on the **National Electricity Transmission System** and/or the **DNO's Distribution System**, in whole or in part in a manner that does not discriminate against or unduly prefer any one or any group of **Suppliers** or their **Customers** or **Other Authorised Distributors** in accordance with the **Distribution Licence**.

DOC6.3 **Scope**

This **Distribution Operating Code** will apply to the **DNO** and to **Users** which in this **Distribution Operating Code** means:

(a) **Customers** (it is not intended that the **Distribution Code** shall apply to small **Customers** individually).

(b) **Embedded Generators**.

(c) **Other Authorised Distributor** connected to the **DNO's Distribution System**.

DOC6.3.2 Implementation of **Demand Control** by the **DNO** may affect all **Suppliers' Customers** and where applicable, contractual arrangements between **Suppliers** and their **Customers** may need to reflect this.

DOC6.4 **Operational System Load Reduction Arrangements**

DOC6.4.1 The **DNO** will arrange within its **DNO's Distribution System** a scheme to reduce load in a controlled manner by reducing voltage and/or by disconnecting **Customers** and/or **Users**.

DOC6.4.2 A **System** of warnings will be contained within the load reduction arrangements to give notice, wherever practical, of impending implementation.

DOC6.4.3 The **DNO** will arrange to have available within the **DNO's Distribution System**, four stages of **Demand Control** in integral multiples of between four and six per cent. These stages may include the use of **Voltage Reduction** and/or other forms of **Demand Control** determined by the **DNO.**

DOC6.4.4 The groups will be arranged so that disconnection can take place uniformly across the **DNO's Distribution System**, and as far as practicable uniformly between **Grid Supply Points.**

DOC6.4.5 The **DNO** will arrange to have available a scheme to implement a further four 5% stages of **Demand Control** upon receipt of a suitable warning from **NGC** which will be issued by 1600 hrs on the previous day.

The **DNO** will arrange to have available a scheme to implement further twelve 5% stages of **Demand Control.**

DOC6.4.6 **Embedded Generators**, **Suppliers**, **Customers** and **Other Authorised Distributors** connected to the **DNO's Distribution System** will need to be considered in the preparation of **DNO's Demand Control** schemes.

DOC6.4.7 The **DNO** shall issue instructions to such **Users** of the **DNO's Distribution System** who are required to disconnect or reconnect and the **User** shall carry out the instructions without delay.

DOC6.4.8 Once a disconnection has been applied at the instruction of the **DNO**, the **User** shall not reconnect until the **DNO** instructs the **User** to do so in accordance with this **Distribution Operating Code.**

DOC6.4.9 The **Users** shall abide by the instructions of the **DNO** with regard to reconnection under this **Distribution Operating Code** without delay.

DOC6.4.10 Where disconnection is envisaged by the **DNO** to be prolonged, the **DNO** may utilise disconnection rotas where 5 per cent groups are interchanged to ensure (so far as practicable) equitable treatment of **Customers**, provided that the proportion of total **Demand** disconnected at all times does not change.

DOC6.5 **Automatic Low Frequency Demand Disconnection**

DOC6.5.1 The **DNO** shall provide automatic low frequency disconnection in stages by tripping relays to disconnect at least 40% of the **DNO's Distribution System Peak Demand** in Scotland and 60% of the **DNO's Distribution System Peak Demand** in England and Wales (based on the winter peak value), in order to seek to limit the consequences of the loss of a major source of generation or an **Event** on the **National Electricity Transmission System** which leaves part of the **Total System** with a generation deficit.

DOC6.5.2 The **Demand** subject to automatic low frequency disconnection shall be split into discrete blocks. The number, location and size of the blocks and the associated low frequency settings will be as specified by the **DNO.** The intention is that the distribution of the blocks will be such as to give a reasonably uniform application throughout the **DNO's Distribution System**, but may take into account any operational requirements and the essential nature of certain **Demand.**

DOC6.5.3 Where conditions are such that, following automatic low frequency disconnection, it is not possible to restore all or a great proportion of those **Customers** so disconnected within a reasonable period of time, the **DNO** may instruct, at any time, further manual load disconnection and instruct a portion of the **Customers** which were disconnected by automatic low frequency disconnection to be restored in order that any further fall in **Frequency** will be contained by operation of automatic low frequency disconnection.

DOC6.5.4 Once an automatic low frequency disconnection has taken place, it shall not be reconnected until the **DNO** instructs to do so in accordance with this **Distribution Operating Code**.

DOC6.5.5 Each **Supplier** and **Other Authorised Distributor** shall abide by the instructions of the **DNO** with regard to reconnection under this **Distribution Operating Code** without delay.

DOC6.5.6 In addition, **Embedded Generators** may wish to disconnect, automatically or manually, their plant from the **System** to which it is connected at certain frequency levels. Any such disconnection will be agreed with the **DNO** on connection to the **DNO's Distribution System** in accordance with the **Distribution Planning and Connection Code**.

DOC6.6 **Emergency Manual Disconnection of Demand**

DOC6.6.1 The **DNO** shall make such arrangements as are necessary to enable it to disconnect **Customers** under emergency conditions irrespective of frequency.

DOC6.6.2 The **DNO** shall annually, by the end of September, prepare schedules with details, on a **Grid Supply Point** basis and including arrangements with **Users**, of the percentage block of **Demand** at that **Grid Supply Point** available for manual disconnection, the method of disconnection to be used and the timescale of the implementation of disconnection of each block.

DOC6.6.3 The scheme will be designed to be called into operation irrespective of **System Frequency**, and to be implemented in predetermined timescales to disconnect **Demand** progressively.

DOC6.6.4 **Customers** and **Other Authorised Distributors** may be required to provide manual disconnection facilities. Where required by the **DNO** to disconnect load, each **Customer** or **Other Authorised Distributor** shall abide by the instructions of the **DNO** with regard to disconnection under this **Distribution Operating Code** without delay and the instructed disconnection must be completed without undue delay.

DOC6.6.5 Once a disconnection has been applied at the instruction of the **DNO** reconnection shall not be applied until the **DNO** instructs it to be done in accordance with this **Distribution Operating Code**.

DOC6.6.6 Each **Customer** and **Other Authorised Distributor** shall abide by the instructions of the **DNO** with regard to reconnection under this **Distribution Operating Code** without delay.

DOC6.7 **Co-ordination of Actions**

DOC6.7.1 Where **Demand Control** is exercised by the **DNO** in order to safeguard the **DNO's Distribution System** the **DNO** will liaise with and inform **Users** accordingly so far as is practical.

DOC6.7.2 Where **Demand Control** is exercised by the **DNO** on instruction or request from **NGC** in order to safeguard the **Total System** then the **DNO** is required to respond to these requests promptly but will liaise with and inform other **Users** so far as is practical.

DISTRIBUTION OPERATING CODE (DOC)

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DOC7 OPERATIONAL LIAISON

DOC7.1 Introduction

DOC7.1.1 This **Distribution Operating Code** DOC7sets out the requirements for the exchange of information in relation to **Operations** and/or **Events** on the **DNO's Distribution System** and on the immediately adjacent parts of adjoining **Systems** which have had (or may have had), or will have (or may have) an **Operational Effect**.

(a) on the **DNO's Distribution System** or on the **System** of any other **User** in the case of an **Operation** and/or **Event** occurring on the **System** of a **User**, and

(b) on the **System** of a **User** in the case of an **Operation** and/or **Event** occurring on the **DNO's Distribution System** or the **National Electricity Transmission System,**

where no requirement for liaison is specified in any other section of the **Distribution Code.**

DOC7.1.2 The requirement to notify in DOC7 relates generally to communicating what has happened or what is to happen and not the reasons why. However, DOC7 provides, when an **Event** has occurred on the **DNO's Distribution System** which itself has been caused by (or exacerbated by) an **Operation** or **Event** on a **User's System**, the **DNO** in reporting the **Event** on the **DNO's Distribution System** to a **User** can pass on what it has been told by the **User** in relation to the **Operation** on that **User's System**.

DOC7.2 Objective

To provide for the exchange of information so that the implications of the **Operation** and/or **Event** can be considered and the possible risks arising from it can be assessed and appropriate action taken by the relevant party in order to maintain the integrity of the **Total System** and the **User's System**. This **Distribution Operating Code** does not seek to deal with any actions arising from the exchange of information, but merely with that exchange.

DOC7.3 Scope

This Distribution Operating Code applies to the **DNO** and to Users, which in this Distribution Operating Code means:-

(a) **Customers.**

(b) **Embedded Generators** connected to the **DNO's Distribution System.**

(c) **Other Authorised Distributors** connected to the **DNO's Distribution System.**

(d) **Suppliers** on behalf of their **Customers** where appropriate.

DOC7.4 **Communications**

DOC7.4.1 The **DNO** and each **User** connected to the **DNO's Distribution System** will establish communication channels to make effective the exchange of information required by DOC7.

DOC7.4.2 Communication should, as far as possible, be direct between the **User** and the operator of the network to which that **User** is connected.

DOC7.4.3 Information between a **DNO** and **Users** will be exchanged on the reasonable request of either party. The request may follow a specific **Operation** or **Event**, or be in accordance with a prior agreement to exchange information on particular types of **Operation** or **Event**.

This does not preclude the voluntary exchange of information which may be perceived as being relevant to the operation of the **DNO** or **User System**, in accordance with good operating practice.

DOC7.5 **Requirement to notify Operations**

DOC7.5.1 **Notification Requirements**

DOC7.5.1.1 In the case of an **Operation** on the **DNO's Distribution System** or on receipt of notification of an **Operation** on the **National Electricity Transmission System**, which will have or may, in the opinion of the **DNO**, have an **Operational Effect** on the **System** of a **User** connected to the **DNO's Distribution System**, the **DNO** will notify the **User** in accordance with DOC7.

DOC7.5.1.2 In the case of an **Operation** on the **System** of a **User** connected to the **DNO's Distribution System**, which, in the opinion of the **User,** will have or may have an **Operational Effect** on the **DNO's Distribution System**, the **User** will notify the **DNO** in accordance with DOC7.

DOC7.5.1.3 An **Operation** may be caused by another **Operation** or an **Event** on another's **System** and in such situations the information to be notified is different from that where the **Operation** arose independently of any other **Operation** or **Event**.

DOC7.5.1.4 Whilst in no way limiting the general requirement to notify in advance as set out in this part of this **Distribution Operating Code**, DOC7.5, the following are examples of circumstances where notification may be required in accordance with this **Distribution Operating Code**:-

(a) The implementation of a scheduled outage of **Plant** and/or **Apparatus** which has been arranged pursuant to **Distribution Operating Code** DOC2.

(b) The **Operation** (other than, in the case of a **User**, at the instruction of the **DNO**) of a circuit breaker or isolator or any sequence or combination of the two, including any temporary over-stressing, **System** parallels, or **Generation Set** synchronising.

(c) Voltage control.

DOC7.5.2 **Form of Notification**

DOC7.5.2.1 A notification under DOC7.5.1 will be of sufficient detail to describe the **Operation**, although it need not state the cause, and to enable the recipient of the notification reasonably to consider and assess the implications and risks arising and will include the name of the individual reporting the **Operation** on behalf of the **DNO** or the **User**, as the case may be. The recipient may seek clarification of the notification.

DOC7.5.2.2 The notification may be written or oral. Written notification must be of an immediate form such as electronic mail. Where the notification is oral, it shall be written down by the sender and be dictated to the recipient who shall write it down and repeat each phrase as received and on completion shall repeat the notification in full to the sender and check that it has been accurately recorded.

DOC7.5.3 **Timing**

A notification under DOC7.5.12 shall be given in sufficient time as will reasonably allow the recipient to consider and assess the implications and risks arising, and to undertake mitigating actions.

DOC7.6 **Requirement to Notify Events**

DOC7.6.1 **Notification Requirements**

DOC7.6.1.1 In the case of an **Event** on the **DNO's Distribution System** or on receipt of notification of an **Event** on the **National Electricity Transmission System**, which, in the opinion of the **DNO**, might have had or will have an **Operational Effect** on the **System** of a **User** connected to the **DNO's Distribution System**, the **DNO** will notify the **User** in accordance with this DOC7. This does not preclude any **User** asking the **DNO**, to whose **System** he is connected, for information regarding the **Event** which has affected the **User's System**.

DOC7.6.1.2 In the case of an **Event** on the **System** of a **User** connected to the **DNO's Distribution System**, which has had or may have had an **Operational Effect** on the **DNO's Distribution System** or on the **National Electricity Transmission System**, the **User** will notify the **DNO** in accordance with this DOC7.

DOC7.6.1.3 An **Event** may be caused by (or exacerbated by) another **Event** or by an **Operation** on another's **System** and in that situation the information to be notified is different from that where the **Event** arose independently or any other **Event** or **Operation**.

DOC7.6.1.4 Whilst in no way limiting the general requirement to notify set out in this part of this **Distribution Operating Code**, DOC7.6, the following are examples of circumstances where notification may be required in accordance with this **Distribution Operating Code**:-

(a) Where **Plant** and/or **Apparatus** is being operated in excess of its capability or may present a hazard to personnel.

(b) The actuation of an alarm or indication of an abnormal operating condition.

(c) Adverse weather conditions being experienced or forecast.

(d) Breakdown of, or faults on, or temporary changes in the capabilities of, **Plant** and/or **Apparatus** including **Protection** control, communications and metering equipment.

(e) Increased risk of inadvertent **Protection** operation.

DOC7.6.2 **Form of Notification**

DOC7.6.2.1 A notification under DOC7.6.1of an **Event,** although it need not state the cause, shall be of sufficient detail to enable the recipient of the notification to reasonably consider and assess the implications and risks arising. Details of the **Event** should include the timescale and the probability of repeat occurrences within a period. The recipient may seek clarification of the notification.

DOC7.6.2.2 The notification may be written or oral. Written notification must be of an immediate form such as electronic mail. Except in an emergency situation any oral notification shall, be written down by the sender and dictated to the recipient who shall write it down and repeat each phrase as received and on completion shall repeat the notification in full to the sender and check that it has been accurately recorded.

DOC7.6.3 **Timing**

A notification under DOC7.6.1 shall be given as soon as practicable after the occurrence of the **Event**, or time that the **Event** is known of or anticipated by the giver of the notification under this **Distribution Operating Code** DOC7.

DOC7.7 **System Control**

DOC7.7.1 Where a part of a **DNO's Distribution System** is, by agreement, under the **System Control** of the **National Electricity Transmission System Control Centre** then the requirements and provisions of the **Grid Code** shall apply to that situation as if that **DNO's Distribution System** was the **National Electricity Transmission System**

DOC7.7.2 Where a part of a **User's System** is, by agreement, under the **System Control** of a Distribution **Control Centre** the **DNO,** then the requirements and provisions of this **Distribution Operating Code** shall apply to that situation as if that **System** was part of the **DNO's Distribution System**.

DOC7.8. **Significant Incidents**

DOC7.8.1 Where an **Event** on the **DNO's Distribution System** or the **National Electricity Transmission System** or the **System** of a **User**, in the opinion of the **DNO**, has had or may have had a significant effect on the **System** of any of the others, the **Event** shall be reported in writing to the owner of the **System** affected in accordance with the provisions of **Distribution Operating Code** DOC10. Such an **Event** will be termed a "**Significant Incident**".

DOC7.8.2 Where the **DNO** notifies a **User** of an **Event** under DOC7, which the **User** considers has had or may have a significant effect on that **User's System**, that **User** will require the **DNO** to report that **Event** in writing and will notify the **DNO** accordingly. Such an **Event** will also be termed a "**Significant Incident**".

DOC7.8.3 Without limiting the general description set out in DOC7.8.1 or DOC7.4.10.2 a **Significant Incident** will include **Events** which result in, or may result in, the following:

(a) Voltage outside statutory limits.

(b) **System Frequency** outside statutory limits.

(c) **System** instability.

DISTRIBUTION OPERATING CODE (DOC)

DISTRIBUTION OPERATING CODE 8

DOC8 SAFETY CO-ORDINATION

DOC8.1 Introduction

DOC8.1.1 This **Distribution Operating Code** DOC8 specifies the **Safety Management System** criteria to be applied by the **DNO** and **Users** for the co-ordination, establishment and maintenance of necessary **Safety Precautions** when work or testing is to be carried out on **Plant** and/or **Apparatus** of **the DNO** or a **User** and where for this to be done safely, isolation on and/or earthing of the other's **System** is needed. This **Distribution Operating Code** does not apply to the situation where **Safety Precautions** need to be agreed solely between **Users**.

DOC8.1.2 This **Distribution Operating Code** does not seek to impose a particular set of **Safety Rules** on the **DNO** and **Users**. The **Safety Rules** to be adopted and used by the **DNO** and each **User** shall be those chosen by each.

DOC8.2 Objectives

To lay down requirements with a view to ensuring safety of persons working at or across Operational and Ownership Boundaries between the **DNO's Distribution System** and Users' Systems.

DOC8.3 Scope

This Distribution Operating Code **DOC8** specifies the **Safety Management System** criteria to be applied by the **DNO** and all **Users** of the **DNO's Distribution System** at or across an **Operational Boundary, Users** for the purposes of this **Distribution Operating Code** being**:-**

(a) **High Voltage Customers.**

(b) **Embedded Generators,** but excluding the **OTSO.**

(c) **Other Authorised Distributors** connected to the **DNO's Distribution System.**

(d) **Meter Operators.**

(e) Any other party reasonably specified by the **DNO** including **Users** with **Unmetered Supply** and those connected at **Low Voltage** for appropriate sections of DOC8 where necessary.

DOC8.4 Operational Safety

DOC8.4.1 Approved Safety Management Systems

DOC8.4.1.1 At each site or location where an **Operational Boundary** exists, a **Safety Management System** specifying the principles and procedures to be applied so as to ensure the health and safety of all who are liable to be working or testing on the **DNO's Distribution System**, or on **Plant** and **Apparatus** connected to it, will be established by the **DNO** and **Users**. For interfaces involving **HV Systems** this shall include the provision for **Control Person(s)**, a system of documentation and the establishment of **Safety Precautions.**

DOC8.4.2 **Authorised Persons**

DOC8.4.2.1 The **DNO** and every **User** shall at all times have nominated a person or persons to be responsible for the co-ordination of safety pursuant to this **Distribution Operating Code**, those persons being referred to in this **Distribution Operating Code** as **Control Persons.** (Under the conditions of the **DNO's Safety Rules** a **Control Person** may either be at the **DNO's Distribution Control Centre** or be a person authorised in accordance with DOC8.4.2.2, who is at the site or location of the **Operational Boundary**).

DOC8.4.2.2 **Control Persons** and persons concerned with the carrying out of **Safety Precautions** and work on or testing of **Plant** and **Apparatus** forming part of, or connected to, the **DNO's Distribution System** shall have a written authorisation designating their role in implementing the **Safety Management System.**

DOC8.4.2.3 The written authorisation shall indicate the class of **Operation** and/or the class of work permitted and the parts of the **System**, **the DNO** and/or **Users**, to which the written authorisation shall apply.

DOC8.4.3 **System of Documentation**

DOC8.4.3.1 A system of documentation shall be maintained by the **DNO** and the appropriate **Users** which will record the inter-system **Safety Precautions** taken when:-

(a) Work and/or testing is to be carried out on **HV Plant** and/or **Apparatus** across the **Operational Boundary**.

(b) Isolation and/or earthing of the other's **System** is required.

DOC8.4.3.2 Where relevant, copies of the **Safety Management Systems** and related documentation shall be exchanged between the **DNO** and **Users** for each **Operational Boundary.**

DOC8.4.3.3 The **DNO** and **Users** shall maintain a suitable system of documentation which records all relevant operational events that have taken place on the **DNO's Distribution System** or any other **System** connected to it and the co-ordination of relevant **Safety Precautions** for work.

DOC8.4.3.4 All documentation relevant to the **Operation** of the **Distribution System**, and **Safety Precautions** taken for work or tests, shall be held by the **DNO** and the appropriate **User** for a period of not less than six months.

DOC8.4.4 **Safety Precautions**

The establishment of **Safety Precautions** involves:-

(a) the isolation from the remainder of the **System** of **Plant** and/or **Apparatus**, including from **Low Voltage** infeeds, either by an **Isolating Device** in the isolating position and immobilised and locked or by other means of rendering the **Plant** or **Apparatus Isolated**, and/or

(b) the earthing by way of providing a connection between a conductor and earth by using an **Earthing Device** which is applied and where reasonably practicable, immobilised and locked, the extent of the **Safety Precautions** required being determined pursuant to this **Distribution Operating Code**.

DOC8.5 **Environmental Safety**

DOC8.5.1 **Site Safety and Security**

DOC8.5.1.1 Arrangements shall be made by the **DNO** and **Users** to ensure site safety and security as required by statutory requirements.

DOC8.5.1.2 Suitable arrangements shall be agreed between the **DNO** and the relevant **Users** to provide free and unrestricted access to the **DNO's Plant** and **Apparatus** at substations or similar by the **DNO's** personnel or their designated representatives at all times.

DOC8.5.2 **Site Specific Hazards**

Suitable arrangements shall be made by the **DNO** and/or the relevant **Users** to ensure that personnel are warned by an appropriate means of hazards specific to any site, before entering any area of the site. This shall include hazards that may be temporary or permanent. Where these risks include contamination or similar, suitable decontamination facilities and procedures shall be provided.

DOC8.6 **Information Flow and Co-ordination**

DOC8.6.1 **Schedules of Responsibility**

DOC8.6.1.1 The **DNO** and **Users** shall jointly agree and set down in writing schedules specifying the responsibilities for **System Control** of **Equipment**. These shall ensure that only one party is responsible for any item of **Plant** or **Apparatus** at any one time.

DOC8.6.1.2 Pursuant to the **Distribution Planning and Connection Code**, **Site Responsibility Schedules** specifying the responsibilities for ownership, operation and maintenance shall be jointly agreed by the **DNO** and the appropriate **User(s)** for each site or location where an **Operational Boundary** or joint responsibility exists. This will include **Operation Diagrams** illustrating sufficient information for **Control Persons** to carry out their duties which shall be exchanged by the **DNO** and the appropriate **User**.

DOC8.6.1.3 A copy of the **Site Responsibility Schedules** and **Operation Diagrams** shall be retained by the **DNO** and the appropriate **User(s). Site Responsibility Schedules** and **Operation Diagrams** shall be maintained by the **DNO** and the appropriate **User(s)** and exchanged as necessary to ensure that they reflect the current agreements.

DOC8.6.2 **Outage Co-ordination**

DOC8.6.2.1 For those **Users** connected at **HV** and having firm supply connections (provided by more than one circuit) and where the **User** so requests the **DNO**, these schedules shall identify those specified **DNO** circuits on which **Planned Outages** by the **DNO** shall be notified to the **User**. These specified circuits will be those where the **DNO** and the **User** have agreed that during outages of the specified circuits the **User** can introduce measures to manage critical processes or safety aspects. These specified circuits will usually operate at the voltage level at which the supply is provided and will have a significant effect on the security level of the **User's** supply.

DOC8.6.2.2 Those **Users** connected at **HV** and not having firm supply connections (provided by more than one circuit) may seek to obtain outage planning information through arrangements with the **DNO**.

DOC8.6.3 **Nomination of Control Persons**

The **DNO** and each **User** shall at all times have nominated a **Control Person** or **Control Persons** responsible for co-ordination of **Safety From The System** pursuant to this **Distribution Operating Code.**

DOC8.6.4 **Communications**

DOC8.6.4.1 Where the **DNO** reasonably specifies the need, suitable communication systems shall be established between the **DNO** and other **Users** to ensure the control function is carried out in a safe and secure manner.

DOC8.6.4.2 Where the **DNO** reasonably decides a back up or alternative routing of communication is necessary to provide for the safe and secure **Operation** of the **DNO's Distribution System** the means shall be agreed with the appropriate **Users**.

DOC8.6.4.3 Schedules of telephone numbers/call signs shall be exchanged by the **DNO** and appropriate **User** to enable control activities to be efficiently co-ordinated.

DOC8.6.4.4 The **DNO** and appropriate **Users** will establish 24-hour availability of personnel with suitable authorisation where the joint operational requirements demand it.

DOC8.7 **Procedures**

DOC8.7.1 Pursuant to this **Distribution Operating Code** the **Control Person** and/or Authorised Persons for each of the **DNO** and a **User** relating to the place where **Safety Precautions** are required will contact each other to coordinate the **Safety Precautions,** and the **Control Person** requesting **Safety Precautions** shall be referred to as the **"Requesting Control Person"** and the **Control Person** being requested and implementing the **Safety Precautions** shall be referred to as the **"Implementing Control Person".**

DOC8.7.2 Procedures shall be maintained by the **DNO** and the appropriate **Users** which clearly specify the responsibility for **System Control** of **Plant** and **Apparatus** and these shall ensure that only one **Control Person** is responsible for any item of **Plant** and **Apparatus** at any one time.

DOC8.7.3 The operational procedures shall be in accordance with the **Safety Management System** agreed between the **DNO** and the **User(s).**

DISTRIBUTION OPERATING CODE (DOC)

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DOC9 CONTINGENCY PLANNING

DOC9.1 Introduction

This **Distribution Operating Code** DOC9 sets out requirements and procedures relating to the following planning procedures for abnormal situations:

DOC9.1.1 Black Start

This **Distribution Operating Code** DOC9 covers the requirements for the implementation of **Black Start** recovery procedures following a **Total Shutdown** or **Partial Shutdown** of the **Total System** as recognised by **NGC.** The **Black Start** procedure provides for the recovery of the **Total System** in the shortest possible time taking into account **Power Station** capabilities and the operational constraints of the **Total System,** in accordance with the **Grid Code** and the requirements of **NGC.**

DOC9.1.2 Re-synchronising Islands

The requirements for re-synchronising parts of the **Total System** where there is no **Total Shutdown** or **Partial Shutdown** but parts of the **Total System** are out of synchronism with each other.

DOC9.1.3 Joint System Incident Procedure

The requirements for the establishment of a communication route and arrangements between responsible representatives of the **DNO** and **Users** involved in, or who may be involved in, an actual or potential serious or widespread **Total System** disruption which requires or may require urgent managerial response, day or night.

DOC9.1.4 Civil Emergencies

The requirements for dealing with a Civil Emergency which under the **Act** is any natural disaster or other emergency which, in the opinion of the **Secretary of State**, is or may be likely to disrupt electricity supplies. The procedures may be similar to, or separate from, the **Demand** reduction schemes in **Distribution Operating Code** DOC6.

DOC9.2 Objectives

This **Distribution Operating Code** sets out Contingency Planning procedures to enable co-ordination between all **Users** with a common approach to give uniformity of priorities to restart or to operate the **Total System** in abnormal situations. It also specifies requirements to be met during periods of declared civil emergencies.

DOC9.3 Scope

This Distribution Operating Code applies to the **DNO** and to Users which in this Distribution Operating Code means, the Users specified below with a High Voltage connection to the **DNO's Distribution System**:

(a) **Customers** (it is not intended that the **Distribution Code** shall apply to small **Customers** individually).

(b) **Embedded Generators**, but excluding the **OTSO.**

(c) **Other Authorised Distributors** connected to the **DNO's Distribution System.**

Any actions required of **Users** connected at **HV** will be identified by the **DNO** and discussed with **Users**.

DOC9.4 **Black Start**

DOC9.4.1 **Shutdown**

DOC9.4.1.1 During a **Total Shutdown** or **Partial Shutdown** and during the subsequent recovery the Security Standards set out in, or deriving authority pursuant to, the **Transmission Licence** and the **Distribution Licence** may not apply and the **Total System** may be operated outside normal voltage and **Frequency** standards.

DOC9.4.1.2 In a **Total Shutdown** or **Partial Shutdown**, it may be necessary for **NGC** to issue Emergency Instructions and it may be necessary to depart from the normal **Balancing Mechanism** operation in issuing Bid-Offer Acceptances.

DOC9.4.1.3 Certain **Embedded Power Stations** are registered by **NGC**, as having the ability of at least one of its **Generation Sets** to start up from shutdown without connections to external power supplies. Such **Power Stations** are to be referred to as **Black Start Stations**.

DOC9.4.1.4 For each **Black Start Station** plans will be put in place, in accordance with the **Grid Code**, which in the event of a **Partial Shutdown** or **Total Shutdown**, will provide for the establishment of a **Power Island**. These plans are known as Local Joint Restoration Plans produced jointly by **NGC** the **DNO** and **Generators** and may include **Embedded Generators. DNO**s will be party to these Plans irrespective of whether the **Black Start Station** is **Embedded.**

DOC9.4.1.5 In Scotland a Local Joint Restoration Plan may include more than one **Black Start Station** and may be produced with and include obligations on the relevant **Transmission Licensee**, **Generators** responsible for **Generation Sets** not at a **Black Start Station** and other **Users**.

DOC9.4.2 **Black Start Situation**

In the event of a **Total Shutdown** or **Partial Shutdown**, the **DNO** will, as soon as reasonably practicable, inform **Users** which, in the **DNO's** opinion, need to be informed that a **Total Shutdown** or, as the case may be, a **Partial Shutdown**, exists and that **NGC** intends to implement the **Black Start** procedure.

In Scotland, in exceptional circumstances, as specified in the Local Joint Restoration Plan, the relevant **Transmission Licensee** may invoke such Local Joint Restoration Plan for its own **Transmission System** and operate within its provisions.DOC9.4.3 **Black Start Recovery Procedure**

DOC9.4.3.1 The procedure necessary for a recovery from a **Total Shutdown** or **Partial Shutdown** is known as **Black Start,** the main objective of which is the restoration of the **Total System** as an integrated whole as soon as possible bearing in mind the restoration of **Customers**. The procedure for a **Partial Shutdown** is the same as that for a **Total Shutdown** except that it applies only to a part of the **Total System**. It should be remembered that a **Partial Shutdown** may affect parts of the **Total System** which are not themselves shut down.

DOC9.4.3.2 The complexities and uncertainties of recovery from a **Total Shutdown** or **Partial Shutdown** require that **Black Start** is sufficiently flexible in order to accommodate the full range of **Generation Set** and **Total System** characteristics and operational possibilities and this precludes the setting out of concise chronological sequences. The overall strategy will in general include the overlapping phases of establishment of isolated groups of **Power Stations** together with complementary local **Demand** termed **"Power Islands"**, step by step integration of these groups into larger sub-systems and eventually re-establishment of a complete **Total System**.

DOC9.4.3.3 Where there are no **Power Stations** with a contracted **Black Start** capability within the **DNO's Distribution System**, then restoration of supply may be substantially delayed while the relevant **Transmission Licensee** re-establishes the **National Electricity Transmission System** or part of the **National Electricity Transmission System** from a restored **Power Island** . The **DNO** shall re-appraise the priorities in these situations and restore supplies in accordance with such priorities.

DOC9.4.3.4 The procedure for a **Black Start** shall, therefore, be that specified by the **relevant Transmission Licensee** at the time. **Users** shall abide by the **DNO's** instructions during a **Black Start** situation, even if they conflict with the general overall strategy outlined in DOC9.4.3.2.

DOC9.4.3.5 The **DNO** may, in accordance with the relevant **Transmission Licensee's** requirements, be required to issue instructions (although this list should not be regarded as exhaustive) to a **Black Start Station** relating to the commencement of generation, to a **User** connected to the **DNO's Distribution System** or **Customers** in the **DNO's** authorised operating area, as appropriate, relating to the restoration of **Demand** and to an **Embedded Power Station** relating to their preparation for commencement of generation when an external power supply is made available to them, and in each case may include switching instructions.

DOC9.4.3.6 Where the **DNO**, as part of the **Black Start** procedure, has given an instruction to a **Black Start Station** to initiate startup the **Black Start Station** shall confirm to the **DNO** when the startup of a **Generation Set** has been completed. Following confirmation of startup, the **DNO** will endeavour to stabilise that **Generation Set** by the establishment of appropriate **Demand** following which the **DNO** may instruct the **Black Start Station** to start up the remaining available **Generation Sets** and auxiliary gas turbines if any at that **Black Start Station** and synchronise them to create a **Power Island.**

DOC9.4.3.7 **Interconnection of Power Islands**

In accordance with the requirements of the relevant **Transmission Licensee,** the **DNO** may be required to issue instructions to **Users** so as to establish, maintain and expand **Power Islands** and to interconnect **Power Islands** to achieve larger sub-systems and subsequently to form an integrated **System** and re-establishment of the **Total System**. **Users** shall at all times abide by the **DNO's** instructions in relation to interconnection of **Power Islands**.

DOC9.4.3.8 The conclusion of the **Black Start** situation and the time of the normal operation of the **Total System** will be determined by the relevant **Transmission Licensee** who shall inform the **DNO.** The **DNO** will inform **Users** of the **DNO's Distribution System** which in the **DNO's** opinion need to be informed that the **Black Start** situation no longer exists and that normal operation of the **Total System** has begun.

DOC9.5 **Re-synchronisation of De-synchronised Islands**

DOC9.5.1 Where parts of the **Total System** are out of synchronism with each other but there is no **Total Shutdown** or **Partial Shutdown NGC** will instruct **Users** to regulate generation or **Demand**, as the case may be, to enable the de-synchronised islands to be re-synchronised.

DOC9.5.2 **DNOs** may be involved in re-synchronising by issuing instructions to **Users** in accordance with the requirements of **NGC. Users** shall at all times abide by the **DNO's** instructions in relation to re-synchronising de-synchronised islands.

DOC9.5.3 The re-synchronising of de-synchronised islands are covered by De-synchronised Island Procedures agreed between **NGC** and the relevant **Transmission Licensee, DNO** and **Generators**.

DOC9.6 **Joint System Incident Procedure**

DOC9.6.1 A **Joint System Incident** is an **Event** (as referred to in **Distribution Operating Code** DOC7) wherever occurring which in the opinion of the **DNO** has or may have a serious and/or widespread effect on, in the case of an incident on a **User's System**, the **DNO's Distribution System** or the **National Electricity Transmission System** or, in the case of an incident on the **DNO's Distribution System** or the **National Electricity Transmission System,** on a **User's,** or **Users'**, **System(s)**. Where an incident on a **User's System** has or may have no effect on the **DNO's Distribution System** or the **National Electricity Transmission System**, then such an incident does not fall within this **Distribution Operating Code** and accordingly DOC9 shall not apply to it.

DOC9.6.2 Each **User** requested by the **DNO** in accordance with the **Distribution Planning and Connection Code**, shall provide in writing to the **DNO** and the **DNO** shall provide in writing to each such **User** a telephone number or numbers at which or through which responsible management representatives, who are fully authorised to take binding decisions on behalf of their appointers, can be contacted day or night when there is a **Joint System Incident**. The lists of telephone numbers shall be provided at the time that a **User** connects to the **DNO's Distribution System** and must be updated (in writing) as often as the information contained in them changes.

DOC9.6.3 On the occurrence of an **Event**, then pursuant to **Distribution Operating Code** DOC7:

(a) If it is on the **System** of a **User**, the **User** shall notify the **DNO** accordingly together with any other **User** who is or may be affected and will inform the **DNO** of which **Users** it has informed.

(b) If it is on the **DNO's Distribution System,** the **DNO** shall notify all **Users** who are or may be affected.

DOC9.6.4 Following notification by a **User** of an **Event**, the **DNO** will if it considers necessary, telephone the **User** on the telephone number referred to in DOC9.6.2 to obtain such additional information as it requires.

DOC9.6.5 Following notification of an **Event** in accordance with DOC9.6.3(a) or (b), and/or the receipt of any additional information requested pursuant to DOC9.6.4, the **DNO** will determine whether or not the **Event** is a **Joint System Incident**, and, if so, the **DNO** may set up a **System Incident Centre** in order to avoid overloading existing operational arrangements of the **DNO**.

DOC9.6.6 The **DNO** shall as soon as possible notify all relevant **Users** that a **System Incident Centre** has been established and the telephone number(s) of the **DNO's System Incident Centre** if different from those already supplied pursuant to DOC9.6.2.

DOC9.6.7 All communications between the responsible management representatives of the relevant parties with regard to the **DNO's** role in the **Joint System Incident** shall be made via the **System Incident Centre**, if it has been established.

DOC9.7 **Civil Emergencies**

DOC9.7.1 Directions under Section 96 of the **Act** place an obligation on the **DNO** to prepare and maintain plans for mitigating the effects of any civil emergency which may occur in accordance with the Electricity Supply Emergency Code. That Code describes the steps which Government might take to deal with an electricity supply emergency envisaged under Section 96(7) of the **Act** or Section 3(i)(b) of the Energy Act 1976 and sets down the actions which Companies in the Electricity Supply Industry should plan to take and which may be needed or required in order to deal with such an emergency.

DOC9.7.2 In an electricity emergency it may become necessary to restrict **Users' Demand** for and consumption of electricity and may be achieved by one or more of the following methods:

(a) Appeals by the Government to the public for voluntary restraint.

(b) The issue of Orders under the Energy Act 1976 requiring restrictions on consumption by industry and commerce.

(c) The issue of directions under the Energy Act 1976 requiring rota disconnections and associated restrictions.

DOC9.7.3 In the event that the **Secretary of State** issues directions to the **DNO** to implement rota disconnections, the **DNO** will establish an Emergency Co-ordinating Centre and as soon as possible establish communications with such relevant **Users** as is necessary to ensure operational liaison. The plans to be implemented will be similar or separate from the schemes outlined in **Distribution Operating Code,** DOC6.

DOC9.7.4 The plans make provision for the need to maintain supply, so far as practicable, to consumers in protected categories. For the purpose of the **Distribution Code** Nuclear **Generating Plant** shall be deemed to be a protected category in accordance with the provisions of DOC6.1.4.

DISTRIBUTION OPERATING CODE (DOC)

DISTRIBUTION OPERATING CODE 10

DOC10 OPERATIONAL EVENT REPORTING AND INFORMATION SUPPLY

DOC10.1 Introduction

DOC10.1.1 This **Distribution Operating Code** DOC10 sets out the requirements for reporting in writing and, where appropriate, more fully those **Events** termed **Significant Incidents** which were initially reported under **Distribution Operating Code** DOC7 and those statutory specified events to be reported under the **ESQCR**.

Information between a **DNO** and **Users** will be exchanged on the reasonable request of either party.

DOC10.1.2 DOC10 also provides for the joint investigation of **Significant Incidents** by the **Users** involved.

DOC10.2 Objectives

The objective of this **Distribution Operating Code** is to facilitate the provision of more detailed information in writing and, where agreed between the **DNO** and the **Users** involved, joint investigation of those **Significant Incidents** initially reported under DOC7.

DOC10.3 Scope

This Distribution Operating Code DOC10 applies to the **DNO** and to Users, which in this Distribution Operating Code means:-

(a) **High Voltage Customers.**

(b) **Embedded Generators** connected to the **DNO's Distribution System** at **HV**.

(c) **Other Authorised Distributors** connected to the **DNO's Distribution System** at **HV.**

(d) Suppliers on behalf of their **Customers** where appropriate.

DOC10.4 Communications

DOC10.4.1. The **DNO** and **Users** connected to the **DNO's Distribution System** shall establish communication channels to ensure the effectiveness of this **Distribution Operating Code**. Communication should, as far as possible, be direct between the **User** and the operator of the network to which that **User** is connected. However, this does not preclude communication with the **User's** nominated representative.

DOC10.4.2 **Operational Event Reporting**

DOC10.4.2.1 **Written Reports of Events by Users to the DNO**

In the case of an **Event** which has been reported initially to the **DNO** under DOC7.6 and subsequently has been determined by the **DNO** to be a **Significant Incident**, a written report will be given to the **DNO** by the **User** in accordance with DOC10. The **DNO** will not pass this report on to other affected **Users** but may use the information contained therein in preparing a report under DOC10 to a **User** in relation to a **Significant Incident** on the **DNO's Distribution System** which has been caused by (or exacerbated by) the **Significant Incident** on the **User's System**.

DOC10.4.2.2 **Written Reports of Events by the DNO to Users**

In the case of an **Event** which has been reported initially to the **User** under DOC7.6 and subsequently has been determined by the **User** to be a **Significant Incident**, a written report will be given to the **User** by the **DNO** in accordance with DOC10. The **User** will not pass this report on to other affected **Users** but may use the information contained therein in preparing a report for another **Authorised Electricity Operator** connected to its **System** in relation to a **Significant Incident** which has been caused by (or exacerbated) the **Significant Incident** on the **DNO's Distribution System**.

DOC10.4.3 **Form of Report in Writing**

DOC10.4.3.1 A report under DOC10.4.2 will be in writing and shall be sent to the **DNO** or **User**, as the case may be, containing written confirmation of the initial notification given under DOC7 together with more details relating to the **Significant Incident**, although it need not state the cause of the **Event** save to the extent required under DOC7.6.2 and such further information which has become known relating to the **Significant Incident** since the initial notification under DOC7. The report should, as a minimum, contain those matters specified in the Appendix 1 of this DOC10 which is not intended to be exhaustive to this DOC10. The recipient may raise questions to clarify the notification, and the giver of the notification will, in so far as it is able, answer any questions raised.

DOC10.4.4 **Timing of the Report in Writing**

DOC10.4.4.1 A written report under DOC10.4.2 shall be given as soon as reasonably practicable after the initial notification under DOC7 and in any event a preliminary report shall normally be given within 24 hours of such time.

DOC10.4.5 **Statutory Reports of Specified Events**

DOC10.4.5.1 Nothing in this **Distribution Operating Code** shall be construed as relieving **DNOs** or **Users** from their duty to report events specified in the **ESQCR** in accordance with those **Regulations** in so far as they apply to **Users**.

DOC10.4.6 **Joint Investigation into Significant Incidents**

DOC10.4.6.1 Where a **Significant Incident** has been declared and a report submitted under DOC10 either party or parties may request in writing that a joint investigation be carried out.

DOC10.4.6.2 The composition of such an investigation panel will be appropriate to the incident to be investigated, and agreed by all parties involved.

DOC10.4.6.3 Where there has been a series of **Significant Incidents** (that is to say, where a **Significant Incident** has caused or exacerbated another **Significant Incident**) the parties involved may agree that the joint investigation should include some or all of those **Significant Incidents**.

DOC10.4.6.4 A joint investigation will only take place where all affected parties agree to it. The form and rules of, the procedure for, and all matters (including, if thought appropriate, provisions for costs and for a party to withdraw from the joint investigations once it has begun) relating to the joint investigation will be agreed at the time of a joint investigation and in the absence of agreement the joint investigation will not take place.

DOC10.4.6.5 Any joint investigation under **DOC10** is separate from any inquiry which may be carried out under the **Electricity Supply Industry (ESI)** disputes resolution procedure.

DOC 10 - APPENDIX 1

MATTERS, IF APPLICABLE TO THE SIGNIFICANT INCIDENT, TO BE INCLUDED IN A WRITTEN REPORT GIVEN IN ACCORDANCE WITH DOC10.4.2.

1. Time and date of **Significant Incident**.
2. Location.
3. **Plant** and/or **Apparatus** involved.
4. Brief description of **Significant Incident**.
5 Estimated time and date of return to service.
6 Supplies/generation interrupted and duration of interruption.
7 Set/Station frequency response achieved.
8 Set/Station MVAr performance achieved.
9 Ownership of the faulted **Plant** and/or **Apparatus**.
10 Estimated **Demand Control** relief undertaken.
11 Estimated **Demand** shed Automatic/Manual.
12 Time and date of **Demand** restoration.

DISTRIBUTION OPERATING CODE (DOC)

DISTRIBUTION OPERATING CODE 11

DOC11 NUMBERING AND NOMENCLATURE OF ELECTRICAL APPARATUS AT OWNERSHIP BOUNDARIES

DOC11.1 **Introduction**

DOC11.1.1 This **Distribution Operating Code** DOC11 sets out the responsibilities and procedures for notifying the relevant owners of the numbering and nomenclature of **Apparatus** at **Ownership Boundaries**.

DOC11.1.2 The numbering and nomenclature of **Apparatus** shall be included in the **Operation Diagram** prepared for each site having an **Ownership Boundary**.

DOC11.2 **Objectives**

The prime objective embodied in this **Distribution Operating Code** is to ensure that at any site where there is an **Ownership Boundary** every item of **Apparatus** has numbering and/or nomenclature that has been mutually agreed and notified between the owners concerned to ensure, so far as is reasonably practicable the safe and effective **Operation** of the **Systems** involved and to reduce the risk of error.

DOC11.3 **Scope**

This **Distribution Operating Code DOC11** applies to the **DNO** and to **Users**, which in this **Distribution Operating Code** excludes **Users** connected **at Low Voltage** without **Generation** and protected by a fuse(s) or other device(s) rated at 100 amps or less, (except it may apply to such **Users** who are the sole **User** connected to an **HV/LV** transformer.), and otherwise includes:

(a) **Customers**.

(b) **Embedded Generators,** but excluding the **OTSO.**

(c) **Other Authorised Distributors** connected to the **DNO's Distribution System.**

(d) **Meter Operators**.

DOC11.4 **Procedure**

DOC11.4.1 **New Apparatus**

DOC11.4.1.1 When the **DNO** or a **User** intends to install **Apparatus** having an interface at an **Ownership Boundary** the proposed numbering and/or nomenclature to be adopted for the **Apparatus** must be notified to the other owner(s).

DOC11.4.1.2 The notification shall be made in writing to the relevant owner(s) and will consist of **Operation Diagrams** incorporating the proposed new **Apparatus** to be installed and its proposed numbering and/or nomenclature.

DOC11.4.1.3 The notification shall be made to the relevant owner(s) at least eight months prior to the proposed installation of the **Apparatus**.

DOC11.4.1.4 The relevant owners shall respond in writing within one month of the receipt of the notification confirming both receipt and whether the proposed numbering and/or nomenclature is acceptable or, if not, what would be acceptable.

DOC11.4.1.5 In the event that agreement cannot be reached between the **DNO**, and the other owner(s), the **DNO**, acting reasonably, shall have the right to determine the numbering and nomenclature to be applied at that site.

DOC11.4.2 **Existing Apparatus**

DOC11.4.2.1 The **DNO** and/or every **User** shall supply the **DNO** and/or every other **User** on request with details of the numbering and nomenclature of **Apparatus** on sites having an **Ownership Boundary**.

DOC11.4.2.2 The **DNO** and every **User** shall be responsible for the provision and erection of clear and unambiguous labelling showing the numbering and nomenclature of its **Apparatus** on sites having an **Ownership Boundary.**

DOC11.4.3 **Changes to Existing Apparatus**

DOC11.4.3.1 Where the **DNO** or a **User** needs or wishes to change the existing numbering and/or nomenclature of any of its **Apparatus** on any site having **Ownership Boundary**, the provisions of DOC11.4.1 shall apply with any amendments necessary to reflect that only a change is being made.

DOC11.4.3.2 Where a **User** changes the numbering and/or nomenclature of its **Apparatus**, which is the subject of **DOC11**, the **User** will be responsible for the provision and erection of clear and unambiguous labelling.

DOC11.4.3.3 Where a **DNO** changes the numbering and/or nomenclature of its **Apparatus**, which is the subject of **DOC11**, the **DNO** will be responsible for the provision and erection of clear and unambiguous labelling.

DISTRIBUTION OPERATING CODE (DOC)

DISTRIBUTION OPERATING CODE 12

DOC12 SYSTEM TEST

DOC12.1 Introduction

DOC12.1.1 This **Distribution Operating Code** DOC12 sets out the responsibilities and procedures for arranging and carrying out **System Test** which have or may have an effect on the **Systems** of the **DNO** or **Users**. **System Test** are those tests which involve either simulating conditions or the controlled application of irregular, unusual or extreme conditions on the **Total System** or any part of the **Total System**, but do not include commissioning or recommissioning tests or any other tests of a minor nature.

DOC12.1.2 **System Test** which have a minimal effect on the **Distribution System** of the **DNO** or the **Systems** of others will not be subject to this procedure; minimal effect will be taken to mean variations in voltage, **Frequency** and waveform distortion of a value not greater than those figures which are defined in the **Distribution Planning and Connection Code**.

DOC12.1.3 If the **System Test** proposed by the **DNO** or **User** connected to the **DNO's Distribution System** will or may have an effect on the **National Electricity Transmission System** then the provisions of the **Grid Code** shall apply.

DOC12.1.4 A **System Test** proposed by **NGC** under the **Grid Code** will be treated by the **DNO** as a **System Test** under this DOC 12 if it is considered by the **DNO** to have any effect on **Users** as defined in DOC 12.3.1.

DOC12.2 Objectives

DOC12.2.1 The objectives of this **Distribution Operating Code** are to:-

(a) Ensure that the procedures for arranging and carrying out of **System Test** do not so far as practicable, threaten the safety of either personnel or the general public and cause minimum threat to the security of supplies, the integrity of **Plant** and/or **Apparatus** and cause minimum detriment to the **DNO** and **Users**.

(b) Set out procedures to be followed for establishing and reporting **System Test**.

DOC12.3 Scope

DOC12.3.1 This **Distribution Operating Code** applies to the **DNO** and to **Users**, which in this **Distribution Operating Code** means:-

(a) **High Voltage Customers.**

(b) **Embedded Generators** connected to the **DNO's Distribution System** at **HV.**

(c) **Other Authorised Distributors** connected to the **DNO's Distribution System** at **HV**.

DOC12.4 **Procedure**

DOC12.4.1 **Proposal Notice**

DOC12.4.1.1 When the **DNO** or a **User** intends to undertake a **System Test** which will have or may have an effect on the **System** of others normally six months notice, or as otherwise agreed by the **DNO**, of the proposed **System Test** will be given by the person proposing the **System Test** (the **"**Test Proposer**"**) to the **DNO** and to those **Users** who may be affected by such a **System Test.**

DOC12.4.1.2 The proposal shall be in writing (the "Proposal Notice") and shall contain details of the nature and purpose of the proposed **System Test** and will indicate the extent and situation of the **Plant** or **Apparatus** involved.

DOC12.4.1.3 If in the view of the recipients the information set out in the Proposal Notice is considered insufficient by the recipients they shall as soon as is reasonably practicable contact the Test Proposer with a request in writing for further information which shall be supplied as soon as reasonably practicable. The **DNO** shall not be required to do anything under this **Distribution Operating Code** until it is satisfied with the details supplied in the Proposal Notice or pursuant to a request for further information.

DOC12.4.1.4 If the **DNO** wishes to undertake a **System Test** the **DNO** shall be deemed to have received a proposal of that **System Test**.

DOC12.4.2 **Preliminary Notice and Establishment of Test Panel**

DOC12.4.2.1 The **DNO** shall have overall co-ordination of the **System Test**. Using the information supplied to it under DOC12.4.1 the **DNO** shall determine in its reasonable estimation, which **Users** other than the Test Proposer may be affected by the proposed **System Test**.

DOC12.4.2.2 The **DNO** shall, with the agreement of the **Users** which it has identified may be affected, appoint a **Test Coordinator** as soon as reasonably practicable after it has received a Proposal Notice and in any event prior to the distribution of the Preliminary Notice referred to below.

(a) Where the **DNO** decides that the **DNO's Distribution System** will or may be significantly affected by the proposed **System Test**, then the **Test Coordinator** shall be a suitably qualified person nominated by the **DNO**.

(b) Where **the DNO** decides that the **DNO's Distribution System** will not be significantly affected by the proposed **System Test,** then the **Test Coordinator** shall be a suitably qualified person nominated by the proposer of the **System Test**, in consultation with the **DNO**.

(c) The **DNO** shall as soon as reasonably practicable after it has received a Proposal Notice contact the Test Proposer where the **Test Coordinator** is to be (pursuant to this **Distribution Operating Code**) a person nominated by the Test Proposer and invite him to nominate a person. If the Test Proposer is unable or unwilling to nominate a person within seven days of being contacted by the **DNO** then the proposed **System Test** will not take place.

DOC12.4.2.3 The **DNO** will notify all **Users** identified by it under DOC12.4.2.1 in writing of the proposed **System Test** which in this **Distribution Operating Code** shall be known as a Preliminary Notice. The Preliminary Notice will contain:

(a) The details of the nature and purpose of the proposed **System Test,** the extent and situation of the **Plant** and/or **Apparatus** involved and the **Users** involved.

(b) An invitation to nominate within fourteen days a suitably qualified representative (or representatives if the **Test Coordinator** informs the **DNO** that it is appropriate for a particular **User**) to be a member of a **Test Panel** for the proposed **System Test**.

(c) The name of the **DNO** representative (or representatives) on the **Test Panel** for the proposed **System Test**.

(d) The name of the **Test Coordinator** and whether he was nominated by the proposer of the **System Test** or by the **DNO**.

DOC12.4.2.4 The Preliminary Notice shall be sent within one month of the receipt by the **DNO** of the Proposal Notice or the receipt of any further information requested under DOC12.4.13, whichever is the later. Where the **DNO** is the Test Proposer the Preliminary Notice will be sent as soon as possible after the proposed **System Test** has been formulated.

DOC12.4.2.5 If replies to the invitation in the Preliminary Notice to nominate a representative to be a member of the **Test Panel** have not been received within fourteen days, the **User** which has not replied shall not be entitled to be represented on the **Test Panel**.

DOC12.4.2.6 The **DNO** shall as soon as possible after the expiry of that fourteen day period appoint nominated persons to the **Test Panel** and notify all relevant **Users -** of the composition of the **Test Panel**.

DOC12.4.3 **Test Panel**

DOC12.4.3.1 A meeting of the **Test Panel** shall take place as soon as possible after the **DNO** has notified relevant **Users** of the composition of the **Test Panel**, and in any event within one month of the appointment of the **Test Panel**.

DOC12.4.3.2 The **Test Panel** shall consider:-

(a) The details of the nature and purpose of the proposed **System Test** and other matters set out in the Proposal Notice (together with any further information requested under DOC12.4.2).

(b) The economic, operational and risk implications of the proposed **System Test**.

(c) The possibility of combining the proposed **System Test** with any other tests and with **Plant** and/or **Apparatus** outages which arise pursuant to the **Operational Planning** requirements of the **DNO**, **NGC** and **Users.**

(d) The implications of the proposed **System Test** on plant which comprise or contain **BM Units** which are active (ie. submitting bid-offer data) in the **Balancing Mechanism** insofar as it is able to do so.

DOC12.4.3.3 **Users** who received a Preliminary Notice concerning the proposed **System Test** (whether or not they are represented on the **Test Panel**) shall be obliged to supply that **Test Panel** upon written request with such details as the **Test Panel** reasonably requires in order to consider the proposed **System Test**.

DOC12.4.3.4 The **Test Panel** will meet as often as the **Test Co-ordinator** deems necessary to conduct its business and he shall be the person to convene a meeting.

DOC12.4.4 **Proposal Report**

(a) DOC12.4.4.1 Within two months of the first meeting, the **Test Panel** shall submit a report, which in this **Distribution Operating Code** shall be called a Proposal Report, which shall contain: **System Test** (including the manner in which the **System Test** is to be monitored).

(b) An allocation of costs (including unanticipated costs) between the affected parties, (the general principle being that the Test Proposer will bear the costs).

(c) Such other matters as the **Test Panel** consider appropriate.

The Proposal Report may include requirements for indemnities to be given in respect of claims and losses arising from the **System Test**. All **System Test** procedures must comply with all applicable legislation.

DOC12.4.4.2 If the **Test Panel** is unable unanimously to agree on any decision in preparing its Proposal Report the proposed **System Test** shall not take place and the **Test Panel** will be dissolved.

DOC12.4.4.3 The Proposal Report will be submitted to the **DNO** and to each **User** who received a Preliminary Notice under DOC12.4.2.

DOC12.4.4.4 Within fourteen days of receipt of the Proposal Report, each recipient shall respond to the **Test Coordinator** with its approval of the Proposal Report or its reason for non-approval.

DOC12.4.4.5 In the event of non-approval by one or more recipients, the **Test Panel** shall as soon as practicable meet in order to determine whether the proposed **System Test** can be modified to meet the objection or objections.

DOC12.4.4.6 If the proposed **System Test** cannot be so modified, then the **System Test** will not take place.

DOC12.4.4.7 If the proposed **System Test** can be so modified, the **Test Panel** shall as soon as practicable, and in any event within one month of meeting to discuss the responses to the Proposal Report, submit a revised Proposal Report and the provisions of DOC12.4.4.3 and DOC12.4.4.4 will apply to that submission.

DOC12.4.4.8 In the event of non-approval of the revised Proposal Report by one or more recipients, the **System Test** will not take place and the **Test Panel** will be dissolved.

DOC12.4.5 **Final Test Programme**

DOC12.4.5.1 If the Proposal Report (or, as the case may be, the revised Proposal Report) is approved by all recipients, the proposed **System Test** can proceed and at least one month prior to the date of the proposed **System Test**, the **Test Panel** shall submit to the **DNO** and all recipients of the Proposal Notice a programme which in this **Distribution Operating Code** shall be called a "Final Test Programme" stating the switching sequence and proposed timings, a list of those staff involved in the carrying out of the **System Test** (including those responsible for site safety) and such other matters as the **Test Panel** deem appropriate.

DOC12.4.5.2 The Final Test Programme shall bind all recipients to act in accordance with the provisions contained within the programme in relation to the proposed **System Test**.

DOC12.4.5.3 Any problems with the proposed **System Test** which arise or are anticipated after the issue of the Final Test Programme and prior to the day of the proposed **System Test** must be notified to the **Test Coordinator** as soon as possible in writing. If the **Test Coordinator** decides that these anticipated problems merit an amendment to or postponement of the **System Test**, he shall notify any party involved in the proposed **System Test** accordingly.

DOC12.4.5.4 If on the day of the proposed **System Test** operating conditions on the **System** are such that any party involved in the proposed **System Test** wishes to delay or cancel the start or continuance of the **System Test**, they shall immediately inform the **Test Coordinator** of this decision and the reasons for it. The **Test Coordinator** shall then postpone or cancel, as the case may be, the **System Test** and shall if possible, agree with all parties involved in the proposed **System Test** another suitable time and date or if he cannot reach such agreement, shall reconvene the **Test Panel** as soon as practicable which will endeavour to arrange another suitable time and date and the relevant provisions of the **Distribution Operating Code** shall apply.

DOC12.4.6 **Final Report**

DOC12.4.6.1 At the conclusion of the **System Test**, the Test Proposer shall be responsible for preparing a written report (the "Final Report") of the **System Test** for submission to the **DNO** and other members of the **Test Panel**.

DOC12.4.6.2 The Final Report shall include a description of the **Plant** and/or **Apparatus** tested and of the **System Test** carried out, together with the results, conclusions and recommendations for submission to other members of the **Test Panel**.

DOC12.4.6.3 The Final Report shall not be distributed to any party which is not represented on the **Test Panel** unless the **Test Panel**, having considered the confidentiality issues, shall have unanimously approved such distribution.

DOC12.4.6.4 When the Final Report has been submitted under DOC12.4.2.1 the **Test Panel** shall be dissolved.

DISTRIBUTION DATA REGISTRATION CODE (DDRC)

DDRC1 INTRODUCTION

DDRC1.1 The various sections of the **Distribution Code** require the **DNO** and **Users** to exchange and update data from time to time. The data which is specified in each section of the **Distribution Code** is summarised in the **Distribution Data Registration Code (DDRC)**.

DDRC1.2 The **Distribution Data Registration Code ("DDRC")** provides a series of schedules summarising all requirements for information of a particular type. Each class of **User** is then referred to the appropriate schedule or group of schedules for a statement of the total data requirements in his case.

DDRC1.3 The **DDRC** specifies procedures and timings for the supply of data and subsequent updating, where the timings are covered by detailed timetables laid down in other sections of the **Distribution Code** they are not necessarily repeated in full in the **DDRC**.

DDRC1.4 In the case of an **Embedded Generator** seeking a connection to the **DNO's Distribution System** then irrespective of its potential involvement in the **Balancing Mechanism,** discussions on connection will be with the **DNO** concerned with the connection arrangements, in addition to any discussions required with **NGC** under the **Grid Code**. References to "**Embedded Generator**" in the DDRC shall include existing and prospective **Embedded Generators**.

DDRC2 OBJECTIVE

The objective of the **DDRC** is to collate and list in a readily identifiable form all the data to be provided by:

(a) Each category of **User** to the **DNO** under the **Distribution Code**.

(b) The **DNO** to each category of **User** under the **Distribution Code.**

DDRC3 SCOPE

The **DDRC** will apply to the **DNO** and to all **Users** which for the purpose of the **DDRC** are listed below:

(a) **Customers** It is not intended that the **Distribution Code** shall generally apply to small **Customers** individually; their obligations will be dealt with on their behalf by their **Supplier**.

(b) **Embedded Generators**.

(c) **Other Authorised Distributors** connected to the **DNO's Distribution System.**

(d) **Suppliers**

(e) Any other person who is making application for use of or connection to the **DNO's Distribution System**.

DDRC4 DATA CATEGORIES

DDRC4.1 Categories of Data

Within the **DDRC** the data required by the **DNO** is allocated to one of the following three categories:

(a) **Standard Planning Data (SPD)**

(b) **Detailed Planning Data (DPD)**

(c) **Operational Data (OD)**

DDRC4.2 Standard Planning Data (SPD)

DDRC4.2.1 **Standard Planning Data** is that data listed in the **Distribution Planning and Connection Code** which is required to be supplied by all **Users** when making application for connection to and/or use of the **DNO's Distribution System** in order that the **DNO** may assess the implications for making the connection.

DDRC4.2.2 **Standard Planning Data** will be provided to the **DNO** in accordance with Section DPC6 and DPC7 of the **Distribution Planning and Connection Code**.

DDRC4.2.3 Following an agreement for connection/use of **System**, it is a requirement of the **Distribution Planning and Connection Code** that estimated data supplied by **Users** should be replaced by actual values prior to connection which will be referred to as **Registered Data.**

DDRC4.3 Detailed Planning Data (DPD)

DDRC4.3.1 **Detailed Planning Data** is that data listed in the **Distribution Planning and Connection Code** which is required to be supplied by the **Users** specified for connection to and/or use of the **DNO's Distribution System**.

DDRC4.3.2 **Detailed Planning Data** will be provided to the **DNO** in accordance with Section DPC6 and DPC7 of the **Distribution Planning and Connection Code**.

DDRC4.3.3 Following an agreement for connection/use of **System**, it is a requirement of the **Distribution Planning and Connection Code** that estimated data supplied by **Users** should be replaced by measured values prior to connection.

DDRC4.4 Operational Data (OD)

DDRC4.4.1 **Operational Data** is data, which is required by the **Distribution Operating Codes**.

DDRC4.4.2 **Operational Data** is required to be supplied in accordance with timetables set down in the relevant **Distribution Operating Codes** and is repeated in tabular form in the schedules attached to this **DDRC**.

DDRC5 PROCEDURES AND RESPONSIBILITIES

DDRC5.1 Responsibility for Submission and Updating of Data

In accordance with the provisions of the various sections of the **Distribution Code** and unless otherwise agreed or specified by the **DNO,** each **User** is required to submit data as defined in DDRC6 following and the attached schedules.

DDRC5.2 Methods of Submitting Data

DDRC5.2.1 Data must be submitted to the **DNO** in writing and where possible in the format specified by the **DNO** and must indicate the name of the person who is submitting those schedules.

DDRC5.2.2 If a **User** wishes to change any data item then this must first be discussed with the **DNO** concerned in order for the implications to be considered and the change if agreed (such agreement not to be unreasonably withheld), should be confirmed by the submission of a revised data scheduler by verbal means with confirmation in writing if short timescales are involved.

DDRC5.2.3 The **DNO** will supply data as requested by **Users** and as agreed by the **DNO** where no obligation of confidentiality exists.

DDRC5.3 Changes to User's Data

Whenever a **User** becomes aware of a change to an item of data, which is registered with the **DNO** the **User**, must notify the **DNO** in accordance with the appropriate section of the **Distribution Code**. The method and timing of the notification to the **DNO** is set out in the appropriate section of the **Distribution Code**.

DDRC5.4 Data Accuracy and Data not Supplied

DDRC5.4.1 The **User** is solely responsible for the accuracy of data (or of changes to data) supplied to the **DNO**.

DDRC5.4.2 Any data which the **User** fails to supply when required by any section of the **Distribution Code** may be estimated by the **DNO** if and when, in the **DNO's** view, it is necessary to do so. Such estimates will be based upon data supplied previously for the same **Plant** or **Apparatus** or upon corresponding data for similar **Plant** or **Apparatus** or upon such other information as the **DNO** deems appropriate.

DDRC5.4.3 The **DNO** will advise a **User** in writing of any estimated data it intends to use pursuant to DDRC5.4.2 relating directly to that **User's Plant** or **Apparatus** in the event of data not being supplied. The **DNO** will not be liable as a result of using that estimated data; the responsibility for the accuracy of that data will rest with the **User** as if the data has been supplied by that **User**.

DDRC5.4.4 It is a requirement of the **Distribution Planning and Connection Code** that Registered Project Planning Data is updated by the **User** annually.

DDRC6 DATA TO BE REGISTERED

DDRC6.1 Schedules 1-4 are not used within the **Distribution Code**.

DDRC6.2 Schedules 5a, 5b and 5c - **Embedded Generating Plant** Technical Information.

DDRC6.3 Schedule 5e - **Embedded Transmission System**

DDRC6.4 Schedule 6 - **Demand** forecasts - as described in DOC1, time varying output/generation forecasts for the **Users** defined in the scope.

DDRC6.5 Schedule 7 - **Operational Planning** - as described in **DOC2**, outage planning information.

DDRC6.6 Schedule 8 - **System** Design Information - comprising **System** technical data.

DDRC6.7 Schedule 9 - Load Characteristics - comprising the forecast data for load points indicating for example, the maximum load, the equipment that comprises the load, and the harmonic content of the load.

DDRC6.8 The schedules applicable to each class of **User** are as follows:-

Schedule Number:-	**Title**	**Applicable to:-**
Schedule 5a	**Power Station Data**	All **Power Stations**
Schedule 5b	**Generation Set Data**	All **Embedded Generation Sets**
Schedule 5c	**Generation Set Data**	For specified types of **Generation Set** and ancillary **Plant and Apparatus** (i) Synchronous **Generation Set** (ii) Fixed speed induction **Generation Set** (iii) Doubly fed induction **Generation Set** (iv) Series Converter Connected **Generation Set** (v) Transformers
Schedule 5d	**DNO** Network Data	**DNO's Distribution System**
Schedule 5e	All **Embedded Transmission System**	All **Embedded Transmission System**
Schedule 6	**Demand** Forecasts	All **Embedded Generators** greater than 1MW; Any **Other Authorised Distributor** connected to the host **DNO System**; All **Suppliers**; All **Customers** connected at **HV** whose **Demand** is greater than 5MW

Schedule Number:-	**Title**	**Applicable to:-**
Schedule 7a	**Operational Planning**	All **Embedded Generators** greater than 1MW; Any **Other Authorised Distributor** connected to the host **DNO System**; All **Suppliers**; All **Customers** connected at **HV** whose **Demand** is greater than 5MW
Schedule 8 Schedule 9	**System** Design Information and Load Characteristics	**Embedded Generators**; Any **Other Authorised Distributor** connected to the host **DNO's Distribution System**; All **Suppliers**; All **Customers**

Schedule 5a

DATA REGISTRATION CODE

POWER STATION DATA FOR ALL EMBEDDED POWER STATIONS EXCLUDING THE OTSO

DATA DESCRIPTION **5a Power Station Data**	**UNITS**	**DATA CATEGORY**
APPLICANT'S DETAILS		
Customer's Details		
Company name	Text	**SPD**
Company registered number	Text	**SPD**
Postal address	Text	**SPD**
Contact name	Text	**SPD**
Email address	Text	**SPD**
Telephone number	Text	**SPD**
Facsimile number	Text	**SPD**
Consultant's Details (if applicable)		
Consultant's name	Text	**SPD**
Postal address	Text	**SPD**
Contact name	Text	**SPD**
Email address	Text	**SPD**
Telephone number	Text	**SPD**
Facsimile number	Text	**SPD**
POWER STATION LOCATION AND OPERATION		
Power Station name	Text	**SPD**
Details of any existing **Connection Agreements** for this **Power Station**	Text	**SPD**
Target date for the provision of the connection / commissioning of the **Power Station**	Text	**SPD**
Postal address or site boundary plan (1/500)	Text / Plan	**SPD**
Connection Point (OS grid reference or description)	Text	**SPD**
Connection Point voltage	V	**SPD**
Single line diagram of any on-site existing or proposed electrical plant or, where available, **Operation Diagrams**	Diagram	**SPD**
What security is required for the connection? (see note 1)	Text	**SPD**
Number of **Generation Sets** in **Power Station**	Number	**SPD**

DATA DESCRIPTION **5a Power Station Data**	**UNITS**	**DATA CATEGORY**
Are all **Generation Sets** of the same design/rating? (If not complete the relevant Schedules 5b and 5c for each type)	Y/N	**SPD**
Will the **Power Station** operate in islanded mode?	Y/N	**SPD**
Will **Generating Plant** supply electricity to on-site premises?	Y/N	**SPD**
POWER STATION STANDBY IMPORT REQUIREMENTS (see note 2)		
Maximum **Active Power** import	MW	**SPD**
Maximum **Reactive Power** import (lagging)	MVAr	**SPD**
Maximum **Reactive Power** export (leading)	MVAr	**SPD**
POWER STATION TOP-UP IMPORT REQUIREMENTS (see note 3)		
Maximum **Active Power** import	MW	**SPD**
Maximum **Reactive Power** import (lagging)	MVAr	**SPD**
Maximum **Reactive Power** export (leading)	MVAr	**SPD**
POWER STATION EXPORT REQUIREMENTS (see note 4)		
Total **Power Station** output at **Registered Capacity** (net of auxiliary loads)		
Registered Capacity (maximum **Active Power** export)	MW	**SPD**
Maximum **Reactive Power** export (lagging)	MVAr	**SPD**
Maximum **Reactive Power** import (leading)	MVAr	**SPD**
Total **Power Station** output at **Minimum Generation** (net of auxiliary loads)		
Minimum Generation (minimum **Active Power** export)	MW	**DPD**
Maximum **Reactive Power** export (lagging)	MVAr	**DPD**
Maximum **Reactive Power** import (leading)	MVAr	**DPD**
Power Station performance chart (net, at **Connection Point**, as per DPC7 Figure 1)	Figure	**DPD**
POWER STATION MAXIMUM FAULT CURRENT CONTRIBUTION (see note 5)		
Peak asymmetrical short circuit current at 10ms (i_p) for a 3φ short circuit fault at the **Connection Point**	kA	**SPD**
RMS value of the initial symmetrical short circuit current (I_k”) for a 3φ short circuit fault at the **Connection Point**	kA	**SPD**
RMS value of the symmetrical short circuit current at 100ms ($I_{k(100)}$) for a 3φ short circuit fault at the **Connection Point**	kA	**SPD**

DATA DESCRIPTION **5a Power Station Data**	**UNITS**	**DATA CATEGORY**
Short circuit time constant T", corresponding to the change from I_k" to $I_{k(100)}$	s	**DPD**
Positive sequence X/R ratio at the instant of fault	-	**DPD**
POWER STATION INTERFACE ARRANGEMENTS (see note 6)		
Means of connection, disconnection and synchronising between **DNO** and **User**	Method statement	**SPD**
Site protection / co-ordination arrangements with DNO	Report	**DPD**
Precautions should neutral become disconnected from earth (LV only see ER G59/3-3)	Report	**DPD**
Site communications, control and monitoring (HV / LV)	Report	**DPD**

DATA DESCRIPTION **5a continued**	**Units**	**Data Category for Generators connected at LV**	**Data Category for Generators Connected at HV**
POWER STATION G59 PROTECTION – see note 7			
U/V Stage 1	V and s	**SPD**	**SPD**
U/V Stage 2	V and s	**SPD**	**SPD**
O/V Stage 1	V and s	**SPD**	**SPD**
O/V Stage 2	V and s	**SPD**	**SPD**
U/F Stage 1	Hz and s	**SPD**	**SPD**
U/F Stage 2	Hz and s	**SPD**	**SPD**
O/F Stage 1	Hz and s	**SPD**	**SPD**
O/F Stage 2	Hz	**SPD**	**SPD**
LoM (RoCoF)	Hzs^{-1} and s	**SPD**	**SPD**
LoM (Vector Shift)	degrees	**SPD**	**SPD**
LoM – other		**SPD**	**SPD**

Notes:

1. The **DNO** will assume a single circuit connection to the **Power Station** is required unless stated otherwise. Options include:-
    a. Single circuit connection
    b. Manually switched alternative connection
    c. Automatic switched alternative connection
    d. Firm connection (secure for first circuit outage)
2. This section relates to operating conditions when the **Power Station** is importing **Active Power**, typically when it is not generating. The maximum **Active Power** import requirement and the associated maximum **Reactive Power** import and/or export requirements should be stated.
3. This section relates to operating conditions when the **Power Station** is importing **Active Power**, typically when it is generating, but is not generating sufficient power to cater for all the on-site demand. The maximum **Active Power** import requirement and the associated maximum **Reactive Power** import and/or export requirements should be stated.
4. This section relates to operating conditions when the **Power Station** is exporting **Active Power**. The **Active Power** export and associated maximum **Reactive Power** range should be stated for operation at **Registered Capacity** and for operation at **Minimum Generation**.
5. See ER G74, ETR 120 and IEC 60909 for guidance on fault current data. Additionally, fault current contribution data may be provided in the form of detailed graphs, waveforms and/or tables. This information need not be provided where detailed fault level contribution / impedance data is provided for each **Generation Set** in Schedules 5b or 5c.
6. The interface arrangements need to be agreed and implemented between the **User** and the **DNO** before energisation and consideration should be given to addressing the Distribution Code requirements including DGC5, DGC8, DPC6.7, DPC7.2.6, DOC5, DOC7.4, DOC8.6.3, DOC8.6.4, DOC9 and DOC10. For example DOC7 requires that up to date contact details are provided and procedures are agreed to establish an effective means of communication between the **Generator** and the **DNO**.
7. This information need not be provided where the G59 interface protection is provided on each individual **Generation Set**. In such cases the information should be provided in Schedule 5b.

Schedule 5b

DATA REGISTRATION CODE

GENERATION SET DATA FOR ALL EMBEDDED GENERATION SETS

DATA DESCRIPTION **5b Generation Set Data**	**UNITS**	**Data Category for Generators connected at LV**	**Data Category for Generators Connected at HV**
GENERATION SET GENERAL DATA			
Number of **Generation Sets** to which this data applies	Value	**SPD**	**SPD**
Type of **Generation Set**: Synchronous Generator, Fixed Speed Induction Generator, Double Fed Induction Generator, Series Convertor Connected Generator, Other (provide details)	Text	**SPD**	**SPD**
Technology/Production type (see note 1)	Text	**SPD**	**SPD**
Operating regime – intermittent or non-intermittent (see note 2)	Text	**SPD**	**SPD**
GENERATION SET OUTPUT DATA			
Rated terminal voltage (generator)	V	**SPD**	**SPD**
Rated terminal current (generator)	A	**SPD**	**SPD**
Generation Set Registered Capacity	MW	**SPD**	**SPD**
Generation Set apparent power rating (to be used as base for generator parameters)	MVA	**SPD**	**SPD**
Generation Set rated **Active Power**	MW	**SPD**	**SPD**
Maximum measured **Active Power** P_{60} (see note 3)	MW	**DPD**	**DPD**
Maximum measured **Active Power** $P_{0.2}$ (see note 3)	MW	**DPD**	**DPD**
Minimum Generation (set connected; net of auxiliary loads)	MW	**DPD**	**DPD**
Generation Set Reactive Power capability at rated **Active Power** (gross, at generator terminals)			
Maximum **Reactive Power** export (lagging)	MVAr	**DPD**	**SPD**
Maximum **Reactive Power** import (leading)	MVAr	**DPD**	**SPD**
Generation Set performance chart (gross, at generator terminals, as per DPC7 Figure 1)	Figure	**DPD**	**DPD**

DATA DESCRIPTION **5b Generation Set Data**	**UNITS**	**Data Category for Generators connected at LV**	**Data Category for Generators Connected at HV**
GENERATION SET MAXIMUM FAULT CURRENT CONTRIBUTION (see note 4)			
Peak asymmetrical short circuit current at 10ms (i_p) for a 3φ short circuit fault at the **Generation Set** terminals	kA	None	**SPD**
RMS value of the initial symmetrical short circuit current (I_k") for a 3φ short circuit fault at the **Generation Set** terminals	kA	None	**SPD**
RMS value of the symmetrical short circuit current at 100ms ($I_{k(100)}$) for a 3φ short circuit fault at the **Generation Set** terminals	kA	**SPD**	**SPD**
Short circuit time constant T", corresponding to the change from I_k" to $I_{k(100)}$	s	None	**DPD**
Positive sequence X/R ratio at the instant of fault	-	None	**DPD**
GENERATION SET VOLTAGE CONTROL			
If operating in **Power Factor** control mode, allowable **Power Factor** range		**SPD**	**SPD**
If operating in **Power Factor** control mode, target **Power Factor**		**SPD**	**SPD**
If operating in voltage control mode, voltage set point	V	**SPD**	**SPD**
If operating to any other control mode, description of parameters and set points.	Text	**SPD**	**SPD**
GENERATION SET INSTALLED G59 PROTECTION (see note 5)			
U/V Stage 1	V and s	**SPD**	**SPD**
U/V Stage 2	V and s	**SPD**	**SPD**
O/V Stage 1	V and s	**SPD**	**SPD**
O/V Stage 2	V and s	**SPD**	**SPD**
U/F Stage 1	Hz and s	**SPD**	**SPD**
U/F Stage 2	Hz and s	**SPD**	**SPD**

DATA DESCRIPTION **5b Generation Set Data**	**UNITS**	**Data Category for Generators connected at LV**	**Data Category for Generators Connected at HV**
O/F Stage 1	Hz and s	**SPD**	**SPD**
O/F Stage 2	Hz	**SPD**	**SPD**
LoM (RoCoF)	Hzs^{-1} and s	**SPD**	**SPD**
LoM (Vector Shift)	degrees	**SPD**	**SPD**
LoM – other	Text	**SPD**	**SPD**

Notes:

1. The Production Type should be quoted for all new connections on or after 1 January 2015 and selected from the list below derived from the Manual of Procedures for the ENTSO-E Central Information Transparency Platform:
   - Biomass;
   - Fossil brown coal/lignite;
   - Fossil coal-derived gas;
   - Fossil gas;
   - Fossil hard coal;
   - Fossil oil;
   - Fossil oil shale;
   - Fossil peat;
   - Geothermal;
   - Hydro pumped storage;
   - Hydro run-of-river and poundage;
   - Hydro water reservoir;
   - Marine;
   - Nuclear;
   - Other renewable;
   - Solar;
   - Waste;
   - Wind offshore;
   - Wind onshore; or
   - Other.

   For connections made before 1 January 2015, the technology type(s) used, selected from the list set out at paragraph 2.23 in Version 2 of the Regulatory Instructions and Guidance relating to the distributed generation incentive, innovation funding incentive and registered power zones, reference 83/07, published by Ofgem, in April 2007, may be submitted as an alternative to the production type.

2. Intermittent and Non-intermittent Generation is defined in ER P2/6 as follows:
   - Intermittent Generation: Generation plant where the energy source for the prime mover can not be made available on demand
   - Non-intermittent Generation: Generation plant where the energy source for the prime mover can be made available on demand
3. For wind turbines only - IEC 61400-21 (P_{60} and $P_{0.2}$)
4. See ER G74, ETR 120 and IEC 60909 for guidance on fault current data. Additionally, fault current contribution data may be provided in the form of detailed graphs, waveforms and/or tables. This information need not be provided where detailed fault level contribution / impedance data is provided for the site in Schedule 5a or for each **Generation Set** in Schedules 5c.
5. This information need not be provided where the G59 interface protection is provided on a per **Power Station** basis. In such cases the information should be provided in Schedule 5a.

Schedule 5c (i)

DATA REGISTRATION CODE

GENERATION SET DATA FOR EMBEDDED GENERATION SETS

DATA DESCRIPTION **5c (i) Synchronous Generation Sets (or Equivalent Synchronous Generation Sets – see note 1)**	**UNITS**	**Data Category for Generators connected at LV**	**Data Category for Generators Connected at HV**
GENERATION SET MODEL DATA			
Generation Set identifier	Text	**SPD**	**SPD**
Type of **Generation Set** (round rotor, salient pole or asynchronous equivalent – see note 1)	Text	**SPD**	**SPD**
Positive sequence (armature) resistance	per unit	**DPD**	**SPD**
Short circuit ratio (see note 2)	Number	**DPD**	**DPD**
Inertia constant (**Generation Set** and Prime Mover)	MWsec/ MVA	**DPD**	**SPD**
Direct axis reactances:			
Sub-transient (X''_d) – unsaturated / saturated	per unit	**SPD / SPD**	**SPD / SPD**
Transient (X'_d) – unsaturated / saturated	per unit	**DPD / DPD**	**SPD / SPD**
Synchronous (X_d) – unsaturated / saturated	per unit	**DPD / DPD**	**SPD / SPD**
Quadrature axis reactances:			
Sub-transient (X''_q) – unsaturated / saturated	per unit	None	**DPD / DPD**
Transient (X'_q) – unsaturated / saturated	per unit	None	**DPD / DPD**
Synchronous (X_q) – unsaturated / saturated	per unit	None	**DPD / DPD**
Time constants:			
State whether time constants are open or short circuit	Text	**DPD**	**SPD**
D-axis sub-transient – unsaturated / saturated	s	**DPD / DPD**	**SPD / SPD**
D-axis transient – unsaturated / saturated	s	**DPD / DPD**	**SPD / SPD**
Q-axis sub-transient – unsaturated / saturated	s	None	**DPD / DPD**
Q-axis transient – unsaturated / saturated	s	None	**DPD / DPD**
Stator leakage reactance (unsaturated)	per unit	None	**DPD**
Zero sequence resistance (earthed star only, including any neutral earthing resistance)	per unit	**DPD**	**DPD**
Zero sequence reactance (earthed star only, including any neutral earthing reactance)	per unit	**DPD**	**DPD**
Negative sequence resistance	per unit	**DPD**	**DPD**
Negative sequence reactance	per unit	**DPD**	**DPD**
Rated field current	A	**DPD**	**DPD**

DATA DESCRIPTION **5c (i) Synchronous Generation Sets (or Equivalent Synchronous Generation Sets – see note 1)**	**UNITS**	**Data Category for Generators connected at LV**	**Data Category for Generators Connected at HV**
Field current open circuit saturation curve (from 50% to 120% of rated terminal voltage)	Graph	**DPD**	**DPD**
Potier reactance (if saturation factor available – see note 3)	per unit	**DPD**	**DPD**
Saturation factor (pu field current to produce 1.2pu terminal voltage on open circuit)	per unit	**DPD**	**DPD**
GENERATION SET MODELS			
Governor and prime mover model (see note 4)	Model	**DPD**	**DPD**
AVR / excitation model (see note 4)	Model	**DPD**	**DPD**

Notes:

1. Asynchronous generators may be represented here by an equivalent synchronous generator data set
2. The short circuit ratio (SCR) of a **Generation Set** is one measure of the performance of a machine under short circuit conditions and is important in determining the unit's stability performance. The reciprocal of the per unit on rating saturated synchronous reactance, Xd(sat), is equal to the SCR.
3. The Potier reactance is only required if the saturation factor is available. The saturation factor is defined as the pu value of field current required to generate 1.2pu stator terminal voltage on open circuit.
4. **SPD** will normally be sufficient, except where the **DNO** considers that the stability and security of the network is at risk. Sufficient **DPD** should then be provided in order to build up a suitable **Generation Set** dynamic model for analysis. Alternatively a 'Black Box' dynamic model of the **Generation Set** may be provided. All models should be suitable for the software analysis package used by the **DNO**.

Schedule 5c (ii)

DATA REGISTRATION CODE

GENERATION SET DATA FOR EMBEDDED GENERATION SETS

DATA DESCRIPTION **5c (ii) Fixed Speed Induction Generation Sets**	**UNITS**	**Data Category for Generators connected at LV**	**Data Category for Generators Connected at HV**
GENERATION SET MODEL DATA **(see notes 1 and 2)**			
Magnetising reactance	per unit	**DPD**	**SPD**
Stator resistance	per unit	**DPD**	**SPD**
Stator reactance	per unit	**DPD**	**SPD**
Inner cage or running rotor resistance	per unit	**DPD**	**SPD**
Inner cage or running rotor reactance	per unit	**DPD**	**SPD**
Outer cage or standstill rotor resistance	per unit	**DPD**	**SPD**
Outer cage or standstill rotor reactance	per unit	**DPD**	**SPD**
State whether data is inner-outer cage or running-standstill	Text	**DPD**	**SPD**
Number of pole pairs	number	**DPD**	**DPD**
Gearbox ratio	number	**DPD**	**DPD**
Slip at rated output	%	**DPD**	**SPD**
Total effective inertia constant (generator and prime mover)	MWsec/ MVA	**DPD**	**SPD**
Inertia constant of the generator rotor	MWsec/ MVA	**DPD**	**DPD**
Inertia constant of the prime mover rotor	MWsec/ MVA	**DPD**	**DPD**
Equivalent shaft stiffness between the two masses	Nm/ Electrical radian	**DPD**	**DPD**
Describe method of adding star capacitance over operating range (see notes 3 and 4)	Text	**DPD**	**DPD**

DATA DESCRIPTION **5c (ii) Fixed Speed Induction Generation Sets**	**UNITS**	**Data Category for Generators connected at LV**	**Data Category for Generators Connected at HV**
Shunt capacitance connected in parallel at % of rated output Starting 20% 40% 60% 80% 100%	kVAr or Graph	**SPD**	**SPD**
Active Power and **Reactive Power** import during start-up **Active Power** and **Reactive Power** import during switching operations eg '6 to 4 pole' change-over	MW-MVAr / Time Graphs	**SPD** **DPD**	**SPD** **SPD**
Under voltage protection setting & time delay	puV, s	**SPD**	**SPD**
Governor and prime mover model (see note 5)	Model	**DPD**	**DPD**

Notes:

1. Asynchronous generators may be represented by an equivalent synchronous data set
2. The **User** will need to provide the above data for each asynchronous **Generation Set** based on the number of pole sets (ie two data sets for dual speed 4/6 pole machines).
3. LV connected generators may just have a simple fixed capacitor bank.
4. If electronic power factor control (e.g. SVC) is installed, provide details of the operating range and characteristics e.g. pf or MVAr range - operating regime: constant or voltage set-point / slope and response times.
5. **SPD** will normally be sufficient, except where the **DNO** considers that the stability and security of the network is at risk. Sufficient **DPD** should then be provided in order to build up a suitable **Generation Set** dynamic model for analysis. Alternatively a 'Black Box' dynamic model of the **Generation Set** may be provided. All models should be suitable for the software analysis package used by the **DNO**.

Schedule 5c (iii)

DATA REGISTRATION CODE

GENERATION SET DATA FOR EMBEDDED GENERATION SETS

DATA DESCRIPTION **5c (iii) Doubly Fed Induction Generation Sets**	**UNITS**	**Data Category for Generators connected at LV**	**Data Category for Generators Connected at HV**
Generation Set maximum fault current contribution data (see note 1)	Schedule	**SPD**	**SPD**
GENERATION SET MODEL DATA (see note 2)			
Magnetising reactance	per unit	**DPD**	**SPD**
Stator resistance	per unit	**DPD**	**SPD**
Stator reactance	per unit	**DPD**	**SPD**
Running rotor resistance	per unit	**DPD**	**SPD**
Running rotor reactance	per unit	**DPD**	**SPD**
Standstill rotor resistance	per unit	**DPD**	**SPD**
Standstill rotor reactance	per unit	**DPD**	**SPD**
Rotor current limit	A	**DPD**	**DPD**
Number of pole pairs	number	**DPD**	**DPD**
Gearbox ratio	number	**DPD**	**DPD**
Generator rotor speed range (minimum to rated speed)	rpm	**DPD**	**SPD**
Electrical power output versus generator rotor speed	Graph / Table	**DPD**	**DPD**
Total effective inertia constant (generator and prime mover) at rated speed	MWsec/ MVA	**DPD**	**SPD**
Inertia constant of the generator rotor at rated speed	MWsec/ MVA	**DPD**	**DPD**
Inertia constant of the prime mover rotor at rated speed	MWsec/ MVA	**DPD**	**DPD**
Equivalent shaft stiffness between the two masses	Nm/ Electrica l radian	**DPD**	**DPD**
DFIG unit models including excitation and prime mover control systems (see note 2)	Models	**DPD**	**DPD**

Notes:

1. Fault current contribution data should be provided under Schedule 5b.

2. **SPD** will normally be sufficient, except where the **DNO** considers that the stability and security of the network is at risk. Sufficient **DPD** should then be provided in order to build up a suitable **Generation Set** dynamic model for analysis. Alternatively a 'Black Box' dynamic model of the **Generation Set** may be provided. All models should be suitable for the software analysis package used by the **DNO**.

Schedule 5c (iv)

DATA REGISTRATION CODE

GENERATION SET DATA FOR EMBEDDED GENERATION SETS

DATA DESCRIPTION **5c (iv) Series Converter Connected Generation Sets**	**UNITS**	**Data Category for Generators connected at LV**	**Data Category for Generators Connected at HV**
Generation Set maximum fault current contribution data (see note 1)	Schedule	**SPD**	**SPD**
GENERATION SET MODEL DATA (see note 2)			
Gearbox ratio	number	**DPD**	**DPD**
Generator rotor speed range (minimum to rated speed)	rpm	**DPD**	**SPD**
Electrical power output versus generator rotor speed	Graph / Table	**DPD**	**DPD**
Total effective inertia constant (generator and prime mover)	MWsec/ MVA	**DPD**	**SPD**
Inertia constant of the generator rotor at rated speed	MWsec/ MVA	**DPD**	**DPD**
Inertia constant of the prime mover rotor at rated speed	MWsec/ MVA	**DPD**	**DPD**
Equivalent shaft stiffness between the two masses	Nm/ Electrical radian	**DPD**	**DPD**
SCCG unit models including excitation, voltage/**Reactive Power** and prime mover control systems (see note 2)	Models	**DPD**	**DPD**

Notes:

1. Fault current contribution data should be provided under Schedule 5b.
2. **SPD** will normally be sufficient, except where the **DNO** considers that the stability and security of the network is at risk. Sufficient **DPD** should then be provided in order to build up a suitable **Generation Set** dynamic model for analysis. Alternatively a 'Black Box' dynamic model of the **Generation Set** may be provided. All models should be suitable for the software analysis package used by the **DNO**. Where required by the **DNO,** generator electrical parameters should be provided based on Schedule 5c (i) or 5c (ii), according to the type of machine used.

Schedule 5c (v)

DATA REGISTRATION CODE

GENERATION SET DATA FOR EMBEDDED GENERATION SETS

DATA DESCRIPTION **5c (v) Transformers**	**UNITS**	**Data Category for Generators connected at LV**	**Data Category for Generators Connected at HV**
Transformer identifier	Text	**SPD**	**SPD**
Transformer type (Unit/Station/Auxiliary)	Text	**SPD**	**SPD**
Number of identical units	Number	**SPD**	**SPD**
Type of cooling	Text	**SPD**	**SPD**
Rated (apparent) power	MVA	**SPD**	**SPD**
Rated voltage ratio (on principal tap)	kV/kV	**SPD**	**SPD**
Positive sequence resistance on principal tap	per unit	**DPD**	**SPD**
Positive sequence reactance at principal tap	per unit	**SPD**	**SPD**
Positive sequence reactance at minimum tap	per unit	None	**DPD**
Positive sequence reactance at maximum tap	per unit	None	**DPD**
Zero sequence resistance	per unit	**DPD**	**DPD**
Zero sequence reactance	per unit	**DPD**	**DPD**
Winding configuration (eg Dyn11)	Text	**DPD**	**SPD**
Type of tap changer (on load / off circuit)	Text	**SPD**	**SPD**
Tap step size	%	**SPD**	**SPD**
Maximum ratio tap	%	**SPD**	**SPD**
Minimum ratio tap	%	**SPD**	**SPD**
Tap position in service (for off load tapchangers only)	%	**DPD**	**DPD**
Method of voltage control	Text	**DPD**	**SPD**
Method of earthing of high-voltage winding	Text	**SPD**	**SPD**
Method of earthing of low-voltage winding	Text	**SPD**	**SPD**

Schedule 5d

DATA REGISTRATION CODE

DNO NETWORK DATA

(Data indicative of that which may be requested by Users for parts of the Distribution System)

DATA DESCRIPTION **5d DNO Network Data (see note 1)**	**UNITS**
Fault Level at Connection Point prior to Power Station connection.	
Peak asymmetrical short circuit current at 10ms (i_p) for a 3φ short circuit fault at the **Connection Point**	kA
RMS value of the initial symmetrical short circuit current (I_k") for a 3φ short circuit fault at the **Connection Point**	kA
RMS value of the symmetrical short circuit current at 100ms ($I_{k(100)}$) for a 3φ short circuit fault at the **Connection Point**	kA
Peak asymmetrical short circuit current at 10ms (i_{p-e}) for a 1φ-E short circuit fault at the **Connection Point**	kA
RMS value of the initial symmetrical short circuit current (I_{k-e}") for a 1φ-E short circuit fault at the **Connection Point**	kA
RMS value of the symmetrical short circuit current at 100ms ($I_{k-e(100)}$) for a 1φ-E short circuit fault at the **Connection Point**	kA
Circuit Data	
Circuit schematic diagram and geographic diagram showing normal open points	Diagram
Circuit impedances (R, X, B positive & zero sequence)	Specify
Circuit ratings and any seasonal variations	Specify
Is the network operated radial or non-radial?	Text
Circuit transformer voltage ratios eg HV/433/250	kV/V/V
Are circuit transformers zoned by applying the progressively higher tap settings for each group of transformers in zones along the circuit to optimise voltage regulation?	Y/N
Transformer Data (for each transformer)	
Transformer identifier	Text
Rated voltage ratio (on principal tap)	kV/kV
Winding configuration eg Dyn11	Text
Rated (apparent) power	MVA
Type of tap changer (on load / off circuit)	Text
Tap changer rating (forward and reverse power)	MVA / MVA
Tap step size	%
Maximum ratio tap	%

DATA DESCRIPTION **5d DNO Network Data (see note 1)**	**UNITS**
Minimum ratio tap	%
Normal tap position	%
Method of voltage control (voltage / LDC / NRC / other)	Text / Report
Controlled busbar (high-voltage side / low-voltage side / remote busbar)	Text
Target voltage and limits	kV, ±%
Normal system voltage on the high-voltage side	kV
Normal system voltage on the low-voltage side	kV
Positive sequence resistance	% on rating
Positive sequence reactance at principal tap	% on rating
Zero sequence resistance	% on rating
Zero sequence reactance	% on rating
Method of earthing of the high-voltage winding	Text
Method of earthing of the low-voltage winding	Text

Notes:

1. **Users** are advised to refer to network data items published in the **DNO's** Long Term Development Statement.

Schedule 5e

DATA REGISTRATION CODE

DATA FOR EMBEDDED TRANSMISSION SYSTEMS

DATA DESCRIPTION **5e Embedded Transmission System Data**	**UNITS**	**DATA CATEGORY**
EMBEDDED TRANSMISSION SYSTEM LOCATION & OPERATION		
Embedded Transmission System name	Text	**SPD**
Postal address or site boundary plan (1/500)	Text / Plan	**SPD**
Connection Point (OS grid reference or description)	Text	**SPD**
Connection Point voltage	V	**SPD**
Single line diagram of existing and proposed connections or **Operation Diagrams** when available	Diagram	**SPD**
Number of **Power Stations** and/or **Generation Sets** connected to the **Embedded Transmission System**	Number	**SPD**
Operating regime of **Power Station** and/or **Generation Sets** – intermittent or non-intermittent (see note 1)	Text	**SPD**
Means of carrying out voltage control and/or power factor control at the **Connection Point**	Report	**SPD**
Embedded Transmission System performance chart (net, at **Connection Point**, as per DPC7 Figure 1)	Figure	**DPD**
EMBEDDED TRANSMISSION SYSTEM IMPORT REQUIREMENTS (see note 2)		
Maximum **Active Power** import	MW	**SPD**
Maximum **Reactive Power** import (lagging)	MVAr	**SPD**
Maximum **Reactive Power** export (leading)	MVAr	**SPD**
Requirements for **Top - Up** and / or **Standby** supplies	Text	**SPD**
EMBEDDED TRANSMISSION SYSTEM EXPORT REQUIREMENTS (see note 3)		
Total **Embedded Transmission System** output at **Registered Capacity** (net of auxiliary loads)		
Registered Capacity (maximum **Active Power** export)	MW	**SPD**
Maximum **Reactive Power** export (lagging)	MVAr	**SPD**
Maximum **Reactive Power** import (leading)	MVAr	**SPD**

DATA DESCRIPTION **5e Embedded Transmission System Data**	**UNITS**	**DATA CATEGORY**
Total **Embedded Transmission System** output at **Minimum Generation** (net of auxiliary loads)		
Minimum Generation (minimum **Active Power** export)	MW	**DPD**
Maximum **Reactive Power** export (lagging)	MVAr	**DPD**
Maximum **Reactive Power** import (leading)	MVAr	**DPD**
Embedded Transmission System MAXIMUM FAULT CURRENT CONTRIBUTION (see note 4)		
Peak asymmetrical short circuit current at 10ms (i_p) for a 3φ short circuit fault at the **Connection Point**	kA	**SPD**
RMS value of the initial symmetrical short circuit current (I_k") for a 3φ short circuit fault at the **Connection Point**	kA	**SPD**
RMS value of the symmetrical short circuit current at 100ms ($I_{k(100)}$) for a 3φ short circuit fault at the **Connection Point**	kA	**SPD**
Short circuit time constant T", corresponding to the change from I_k" to $I_{k(100)}$	s	**DPD**
Positive sequence X/R ratio at the instant of fault	-	**DPD**
Embedded Transmission System INTERFACE ARRANGEMENTS (see note 5)		
Means of connection, disconnection and synchronising between **DNO** and **User**	Method statement	**SPD**
Site protection / co-ordination arrangements with DNO	Report	**DPD**
Site communications, control and monitoring (HV / LV)	Report	**DPD**

Notes:

1. Intermittent and Non-intermittent Generation is defined in ER P2/6 as follows:
   - Intermittent Generation: Generation plant where the energy source for the prime mover can not be made available on demand
   - Non-intermittent Generation: Generation plant where the energy source for the prime mover can be made available on demand
2. This section relates to operating conditions when the **Embedded Transmission System** is importing **Active Power**, typically when it is not generating. The maximum **Active Power** import requirement and the associated maximum **Reactive Power** import and/or export requirements should be stated.
3. This section relates to operating conditions when the **Embedded Transmission System** is exporting **Active Power**. The **Active Power** export and associated maximum **Reactive Power** range should be stated for operation at **Registered Capacity** and for operation at **Minimum Generation**.
4. See ER G74, ETR 120 and IEC 60909 for guidance on short-circuit current data. Additionally, fault current contribution data may be provided in the form of detailed graphs, waveforms and/or tables.

5. The interface arrangements need to be agreed and implemented between the **User** and the **DNO** before energisation and consideration should be given to addressing the Distribution Code requirements including DGC5, DGC8, DPC6.7, DPC7.2.6, DOC5, DOC7.4, DOC8.6.3, DOC8.6.4, DOC9 and DOC10. For example DOC7 requires up to date contact details and procedures are required to establish an effective means of communication between the **Generator** and the **DNO**.

Schedule 6

DATA REGISTRATION CODE

DEMAND FORECASTS

DATA DESCRIPTION	UNITS	TIME PERIOD COVERED	UPDATE TIME	DATA CATEGORY
1. Half hour **Active Power** and **Power Factor** at **Annual ACS Conditions** for specified time of the annual peak half hour at the associated **Grid Supply Points** and at the specified time of the annual peak half-hour of the **National Electricity Transmission System Demand**	MW/ MVAr	8 weeks - 3 years	Week 35	**OD**
2. Half hour **Active Power** and **Power Factor** at **Average Conditions** at the specified half hour of the annual minimum **National Electricity Transmission System Demand.**	MW/ MVAr	8 weeks - 3 years	Week 35	**OD**
3. Half hour Power output of **Embedded Generating Plant** and/or **Embedded Transmission System** at the specified half hour of the annual peak half hour of the **National Electricity Transmission System**	MW	8 weeks - 3 years	Week 35	**OD**
4. Schedules for the operation of **Embedded Generation Sets** and/or **Embedded Transmission Systems** whose output is greater than 5MW on a half-hourly basis	MW Date Time	2 weeks to 8 weeks ahead	1600 hrs Friday	**OD**
5. **Supplier**s will provide details of their proposed use of **Demand Control** measures aggregated to 5MW or more (averaged over any half hour) on a half hourly basis for each **DNO Connection Point**.	MW Date Time	2 weeks to 8 weeks ahead	1600 hrs Friday	**OD**

DATA DESCRIPTION	UNITS	TIME PERIOD COVERED	UPDATE TIME	DATA CATEGORY
6. **Customers**, **Suppliers,** Other Network Operators and other **DNOs** connected to the **DNO's Distribution System** shall notify the **DNO** where their or their **Customers** operations are likely to result in an aggregated change in **Demand** at the **DNO Connection Point** of supply of greater than 5MW of the **Demand** at that time on a half hourly basis.	MW Date Time	2 weeks to 8 weeks ahead	1600 hrs Friday	**OD**
7. Items 5, 6 and 7 above updated.		2 days to 12 days ahead	0900 hrs each Wednesday	**OD**
8. Details of differences greater than 5MW from the schedules of operation of any **Embedded Generating Plant** and/or **Embedded Transmission System** on a half-hourly basis submitted under item 5 above.	MW Date Time	0 - 24 hrs ahead	As specified	**OD**
9. Details from **Supplier**s of any differences of the amount and donation of their proposed use of **Customer Demand Control** (aggregated over any half hourly basis submitted under item 6 above).	MW Date Time	0 - 24 hrs ahead	As specified	**OD**
10. Details from each **User** connected to the **DNO's Distribution System** of any change in aggregate **Demand** at the point of surplus of greater than 5MW of the **Demand**.	MW Date Time	0 - 24 hrs ahead	As specified	**OD**

DATA DESCRIPTION	UNITS	TIME PERIOD COVERED	UPDATE TIME	DATA CATEGORY
11. Details of half hour **Active Power** and **Reactive Power** output sent out to the **DNO's Distribution System** by **Embedded Generating Plant** and/or **Embedded Transmission System** during the previous day on a half hourly basis.	MW MVAr	Previous day	0300	**OD**
12.**Supplier**s, Other Network Operators and other **DNOs** connected to the **DNO's Distribution System** will provide details of the amount and duration of **Demand Control** at the **DNO Connection Point** aggregated to 5MW or more (arranged over any half hour) which was implemented during the previous **Operational Day**.	MW Time	Previous day	0300	**OD**

Schedule 7a

OPERATIONAL PLANNING - LONG TERM

YEARS 3 AHEAD-

EMBEDDED GENERATORS CONNECTED TO THE DNO'S DISTRIBUTION SYSTEM AS SPECIFIED BY THE DNO

DATA DESCRIPTION	UNITS	TIME PERIOD COVERED	UPDATE TIME	DATA CATEGORY
1. For individual **Generation Sets** or **Embedded Transmission Systems** the Set/**System** number and **Generation Set/ Embedded Transmission System** capacity. Preferred outage dates earliest start date latest finish date.	MW Date	Years 3 ahead	Week 2	**OD**
2. **DNO** advise **Embedded Generators** of:-				
(a) details of **Embedded Generating Plant** or **Embedded Transmission System** they may withdraw from service.	Date	Years 3 ahead	Week 12	**OD**
(b) **Output Usable** requirements.	MW Date	Years 3 ahead	Week 12	**OD**
3. **Embedded Generators** provide **DNO** with				
(a) update of provisional **Embedded Generating Plant** or **Embedded Transmission System** outage programme.	Date	Years 3 ahead	Week 12	**OD**
(b) **Registered Capacity**.	MW			
(c) Neutral weekly **Output Usable** forecasts.	Date			
4. **DNO** following discussion with **Embedded Generator** will notify, with reason, revision to the provisional **Embedded Generating Plant** or **Embedded Transmission System** outage programme.	Date	Years 3 ahead	Week 28	**OD**

DATA DESCRIPTION	UNITS	TIME PERIOD COVERED	UPDATE TIME	DATA CATEGORY
5. **DNO** following discussion with **Embedded Generator** will notify, with reason, revisions to the provisional **Embedded Generating Plant** or **Embedded Transmission System** outage programme. (This taking into account **User** outages received in Week 28).	Date	Years 3 ahead	Week 42	**OD**
6. **DNO** following discussion with **Users** agree **Users** outages.	Date	Years 3 ahead	Week 43	**OD**

Schedule 7b

OPERATIONAL PLANNING - MEDIUM TERM

YEARS 1-2

EMBEDDED GENERATORS CONNECTED TO THE DNO'S DISTRIBUTION SYSTEM AS SPECIFIED BY THE DNO

DATA DESCRIPTION	UNITS	TIME PERIOD COVERED	UPDATE TIME	DATA CATEGORY
1. For individual **Generation Sets** or **Embedded Transmission System** the Set/**System** numbers and **Embedded Generating Plant/ Embedded Transmission System** capacity. Preferred outage dates earliest start date latest start date.	MW Date	Years 1 - 2	Week 2	**OD**
2. **Embedded Generators** provide the **DNO** with estimates of:-				
(a) **Output Usable**	MW Date	Years 1 - 2	Week 10	**OD**
(b) outage programme	Date	Year 1		
3. **DNO** following discussion with **Embedded Generator** provide:-	Date	Years 1 - 2	Week 12	**OD**
(a) Details of **Embedded Generating Plant** or **Embedded Transmission System** they may withdraw from service for an outage				
(b) Update of **Embedded Generator** outage programme.				
4. **DNO** notify each **Embedded Generator** of **Output Usable** requirements.	MW Date	Years 1 - 2	Week 12	**OD**
5. **Embedded Generator** provides estimates of **Output Usable** of each **Embedded Generating Plant** or **Embedded Transmission System**	MW Date	Years 1 - 2	Week 41	**OD**

Schedule 7c

OPERATIONAL PLANNING - SHORT TERM

EMBEDDED GENERATORS CONNECTED TO THE DNO'S DISTRIBUTION SYSTEM AS SPECIFIED BY THE DNO

DATA DESCRIPTION	UNITS	TIME PERIOD COVERED	UPDATE TIME	DATA CATEGORY
1. For individual **Generation Sets** or **Embedded Transmission Systems** the Set/**System** number and **Embedded Generating Plant/ Embedded Transmission System** capacity. Duration of outage earliest start date latest finishing date.	MW Date	Weeks 9 - 52		
Output Usable estimates.	MW Date	Weeks 9 - 52	Week 2	**OD**
2. **DNO** informs **Embedded Generators** of **Output Usable** requirements.	MW Date	Weeks 9 - 52	Week 4	**OD**
3. **Embedded Generators** provide **DNO** with **Embedded Generating Plant** or **Embedded Transmission System Output Usable** estimates.	MW Date	Weeks 18 - 52	Week 10	**OD**
4. **DNO** informs **Embedded Generators** of change to **Output Usable** requirements.	MW Date	Weeks 18 - 52	Week 12	**OD**
5. **Embedded Generators** provide **DNO** with **Embedded Generating Plant** or **Embedded Transmission System Output Usable** estimates.	MW Date	Weeks 28 - 52	Week 25	**OD**
6. **DNO** informs **Embedded Generators** of changes to **Output Usable** requirements.	MW Date	Weeks 31 - 52	Week 27	**OD**

7. **Embedded Generators** will provide estimates of **Embedded Generating Plant or Embedded Transmission System Output Usable** .	MW Date	Weeks 44 - 52	Week 41	**OD**
8. **DNO** inform contracted **Embedded Generators** of changes to **Output Usable** requirements.	MW Date	Weeks 44 - 52	Week 43	**OD**

Schedule 7d

DATA REGISTRATION CODE

OPERATIONAL PLANNING - USER PLANT, APPARATUS AND SYSTEMS

DATA DESCRIPTION	UNITS	TIME PERIOD COVERED	UPDATE TIME	DATA CATEGORY
Users provide the **DNO** with details of proposed outages which may affect the performance of the **DNO's Distribution System**. Details of trip testing, risks of trip and other information where known which may affect the security and stability of the **DNO's Distribution System** shall also be included.	Dates	Years 1 - 2 and Years 3 ahead	Week 28	**OD**
Update of previously submitted data for year 3 ahead.				
Following consultation with **Users** and **DNO** will include agreed outage proposals in the programme.	Date	Years 3 ahead Years1 - 2	Week 43 Week 48	**OD** **OD**
As changes occur.	Update of **Users** proposals agreed in the Medium Term Plan.			

Schedule 8

DATA REGISTRATION CODE

SYSTEM DESIGN INFORMATION

DATA DESCRIPTION	**UNITS**	**DATA CATEGORY**
General Information: Type of load and control arrangements Maximum load on each phase at time of **Peak Demand**		**DPD**
Fluctuating Loads:		
Rate of change of **Demand** – **Active Power** and **Reactive Power** increasing and decreasing	MW/s MVAr/s	**DPD**
Shortest repetitive time intervals between fluctuations in **Demand Active Power** and **Reactive Power**	s	**DPD**
Largest step change **Active Power** and **Reactive Power** increasing and decreasing	MW/s MVAr/s	**DPD**
Maximum energy **Demand** per half hour	MWh	**DPD**
Steady state residual **Demand** (MW) between **Demand** fluctuations	MW	**DPD**
Reactive Compensation		
Rating of individual shunt reactors (not associated with cables)	MVAr	**DPD**
Rating of individual capacitor banks	MVAr	**DPD**
Details of any automatic control logic such that operating characteristics can be determined.	Text/ Diagrams	**DPD**
Point of connection to the **System**	Diagram	**DPD**
Lumped Network Susceptance		
Details of the equivalent lumped network susceptance of the **User System** referred back to the connection with the **DNO's Distribution System**.	MVAr	**DPD**

DATA DESCRIPTION	UNITS	DATA CATEGORY
Including shunt reactors which are an integrated part of a cable system and which are not normally in or out of service independent of the cable. Excluding independently switched reactive compensation connected to the **User System** and any susceptance of the **User System** inherent in the active and reactive **Demand**.		**DPD**
Fault Infeeds		
Maximum and minimum short circuit infeeds into the **DNO's Distribution System**	MVA	**DPD**
X/R ratio under maximum and minimum short circuit conditions		**DPD**
[Contribution from rotating plant]		**DPD**
Equivalent network information at the request of the **DNO**		**DPD**
Interconnection Impedance		**DPD**
For **User** interconnections that operate in parallel with the **DNO's Distribution System** details of the interconnection impedance shall be exchanged between the **DNO** and **User**, including Positive Sequence Resistance Zero Sequence Resistance Positive Sequence Reactance Zero Sequence Reactance Susceptance	 % on 100 % on 100 % on 100 % on 100 % on 100	 **DPD** **DPD** **DPD** **DPD** **DPD**
If the impedance in the view of the **DNO** is low then more detailed information will be requested.		
Demand Transfer Capability		**DPD**
Information shall be exchanged on **Demand** transfer capability where the same **Demand** may be supplied from alternative **DNO** or **User** points of supply including the proportion of **Demand** normally fed from each point of supply	MW	**DPD**

DATA DESCRIPTION	UNITS	DATA CATEGORY
The arrangements for manual/automatic transfer under planned/outage conditions should be provided		**DPD**
Non - **DNO System** Data		
The **DNO** will request information on circuit parameters, switchgear and **Protection** arrangements	Text/ Diagrams	**DPD**
Transient Overvoltages		**DPD**
Demand Profile For Day Of **Exit Point Peak Demand**		**DPD**
Demand Profile For Day Of **Exit Point** Minimum **Demand**		**DPD**

Schedule 9

DATA REGISTRATION CODE

LOAD CHARACTERISTICS

DATA DESCRIPTION	**UNITS**	**DATA CATEGORY**
Geographical and electrical point of connection and date connection required Diagrams existing and proposed connections	Text	**SPD**
Types of **Demand**:-		
Maximum **Active Power Demand Registered Capacity**	MW	**SPD**
Maximum and minimum **Reactive Power** requirement	MVAr	**SPD**
Type of load and control arrangements. Eg variable speed motor type of starter employed	Text	**SPD**
Maximum **Phase Voltage Unbalance**	Ratio/ Phase at the time	**SPD**
Maximum harmonic content	% THVD	**SPD**
Fluctuating Loads:- Graphical indication of typical cycle variation of **Demand** (Active / Reactive)	Graphical	**SPD**
Load Management Data	Text	
Maximum short circuit infeed based on **Generation Set** subtransient reactance	MVA	**SPD**
Maximum zero phase sequence impedance of the **User's System** at the connection point	% on 100 MVA	**SPD**
2 hour **Demand** profiles for **Peak Demand**	MW and MVAr	**SPD**
Monthly **Peak Demand** variation	MW and MVAr	**SPD**

ANNEX 2 - QUALIFYING STANDARDS

This Annex prescribes the Electricity Supply Industry Standards that have a material effect on **Users** but do not implement any **Distribution Code** requirements and do not form part of the **Distribution Code** technical requirements.

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, 6th Floor, Dean Bradley House, 52 Horseferry Road, London SW1P 2AF, http://**www.energynetworks.org**/.

1 **Engineering Recommendation G81** Framework for design and planning, materials specification and installation and record for Greenfield low voltage housing estate installations and associated, new, HV/LV distribution substations.

2 **Distributed Generation Connection Guides** (published by Energy Networks Association)

3 **Engineering Technical Report 130-1**
Application Guide for assessing the Capacity of Networks Containing Distributed Generation

4 **Engineering Technical Report 131**

Analysis Package for Assessing Generation Security Capability – Users' Guide

5 **Engineering Recommendation P18**
Complexities of 132kV circuits.

6 **Engineering Recommendation G87**

Guidelines for the Provision of Low Voltage Connections to Multiple Occupancy Buildings

ISSUE SUMMARY

No.	Date	Details of Change
1	01/10/02	This is the **first issue** of the Distribution Code for Great Britain. The D Code has been formed from an amalgamation of the pre-existing Scottish (Issue 4), and England & Wales (Modification 13) D Codes. There are no deliberate policy changes introduced in this first issue of the GB code: the drafting reflects the requirements existing in both forerunner codes. However there are changes to the wording from both codes necessary in adopting a common text. These changes have been kept to a minimum consistent with developing a common Distribution Code for Great Britain. The detail of these changes from the forerunner codes was publicly consulted on as part of the process of introducing the Distribution Code for Great Britain. Where there are technical, regulatory or institutional differences between Scotland and England & Wales the drafting has preserved these differences in the combined code where necessary.
2	01/03/03	Annex 1 amended to recognize that ER G75 has been re-issued as ER G75/1.
3	01/09/03	Modifications in respect of data requirements for **Embedded Generator**s – particularly: • the addition of new DPC1.6 and DPC1.7; • additions to DPC4.5.1; • new DPC5.1.2; • modified DPC7.3 and new DPC7.3.4 Modifications to the **Distribution Data Registration Code**
4	01/03/04	Introduction of ER G83/1 governing the connexion of small scale generation. Minor changes to definitions of **Embedded Generator** and **Generator**, plus new note in DPC7.1.3 and minor explanatory notes in 5.4.5 and Appendix 1 of the Guide. Rationalization of use of **Embedded Generator** and **Generator** throughout the text. Modification to the following clauses for the consequential changes attendant on the replacement of the Electricity Supply Regulations with the Electricity Safety, Quality and Continuity Regulations: DPC4.2.2.1; DPC4.2.2.2; DPC4.4.2; DPC4.4.4; DPC5.2.1; DPC5.3.4; DPC5.4.3; DOC5.4.8; DOC10.1.1; DOC10.4.5.1
5	01/08/04	Governance of Standards Modification to: Glossary and Definitions: addition of Annex 1 Standard; Appendix 1 Standard; Individual DNO Standard; Qualifying Standard. new DGC 4.2 (g) & (h) DGC 4.4 House keeping Changes to: DPC 5.4.1 (and Guide 2(e)) and DPC 5.4.3

6	01/04/06o	Modifications for BETTA and LEEMPS Significant definitional and consequential changes to harmonize with BETTA and GB Grid Code drafting. Licence Exempt Embedded Medium Power Station drafting including: • New definition of a DC Converter • Modifications to DPC7.3.3 in relation to data requirements • Addition of new section DPC7.5 relating to data and connexion requirements • Addition of new Section DOC 5.6 in relation to compliance testing of Medium Power Stations
7	01/07/06	Replace ER P2/5 with ER P2/6 and the following consequential changes: • Addition of ETRs 130 and 131 to Annex 2. • Harmonization of lower limit for DDRC Schedules 6 & 7 at 1MW Replace ER G5/4 with ER G5/4-1 in Annex 1 and in DPC 4.2.3(b)
8	01/11/06	Modify the definitions of Large, Medium and Small Power Stations to align with changes to the GB Grid Code.
9	01/06/08	Minor housekeeping corrections to DGC6.1 and DOC 1.1.5 to point to DGD 2(vi). Replace references to G83/1 with references to G83/1-1
10	15/12/08	Modified to include IDNOs in governance of the D Code. Primarily mods to DGC4. Gas and Electricity Consumers's Committee changed to NCC in accordance with Ofgem directive of 1 October 2008.
11	24/06/09	Modified for Offshore Transmission. New definitions of : Embedded Transmission Licensee Embedded Transmission System Existing Offshore Generators Great Britain National Electricity Transmission System National Electricity Transmission System Demand Offshore Offshore Transmission Implementation Plan Offshore Transmission System Operator Offshore Transmission Licensee Offshore Transmission System Onshore Transmission Licensees Onshore Transmission System SHETL SPT and consequential amendments. Various changes to the code to ensure that conceptually an embedded transmission system, ie an offshore transmission system

		connecting to a DNO network is treated like a Large Power Station for planning and operating purposes. Note that for safety interfaces etc, the offshore transmission network is treated in the code in the same way as an existing onshore transmission interface.
12	01/02/10	Addition of revised ENA TS 41-24 to Annex 1
13	01/08/10	Revised for updated requirements for the connexion of embedded generation. Revision to the definition of **System Stability** Replacement of Annex 1 Item 3 with ER G59/2 Removal of Annex 1 Item 4 ER G75/1 Addition of new document to Annex 2 - ER P18. New section DGC11 DPC4.2.3 re-organized and amended to include the treatment of voltage step changes. New DPC4.4.1(f) citing ER P18 as a limit on 132kV system design complexity. New DPC 7.1.4 dealing with short term paralleling requirements New DPC7.2 section dealing with operational requirements transferred from G59 New DPC7.4.3section dealing with protection requirements, mainly transferred from G59 Modified DPC7.4.4 for fault ride through requirements New DPC 7.4.5 for system stability requirements mainly transferred from ER G75/1 New DPC 7.4.6 on earthing, largely incorporating requirements from G59 New DPC7.4.9.2 detailing requirements for commissioning tests Review and updating of DDRC schedules.
14	01/02/11	Changes to DGC4.5 and Constitution and Rules to require consideration of greenhouse gas emissions. Update to Annex 2 Item 2, the Distributed Generation Connexion Guide
15	12/04/11	Inclusion of Guidance Note 2 in the published version of the D Code Revision of G59/2 to G59/2-1 in Annex 1
16	01/08/11	Addition of ER G87 Guidelines for the Provision of Low Voltage Connections to Multiple Occupancy Buildings to Annex 2 of the Guide to the Distribution Code
17	07/10/11	Minor amendments to Guidance Note 2.
18	29/03/12	Minor amendments to Guidance Note 2.
19	01/11/12	Replace G83/1-1 with G83/2 and update Guidance Note 2.

		Add Guidance Note 3
20	01/09/13	Modifications to the protection requirements in 7.4.3.4 to align with G59/3
21	01/01/14	Modifications to DGC to implement the Code Adminstrators' Code of Practice. Modification to DIN 2.1 to implement EU Third Package requirements. Minor housekeeping changes to definitions of Distribution Data Registration Code and Distribution Code Review Panel to correct typographical errors.
22	01/02/14	Modification to Annex 1 to note the change from ER G12/3 to ER G 12/4
23	01/08/14	Modification to DPC 7.4.3.3 and DPC 7.4.3.4 to increase RoCoF protection settings to provide greate Total System stability
24	21/08/14	Modfications to DPC 7.4.2 and Schedules 5a and 5b to accommodate additional reporting of Small Generator data to National Grid
25	21/08/14	Modfications to DOC2.2 and DOC2.4 to relect EU Transparency Regulations on demand customers >100MW Housekeeping amendments to: • DOC 6.1.3 (Electricity Supply Emergency Code nane change) • Amended DGC 4.3(d) to replace National Consumers' Council with Citizens Advice. • Update of reference to ETR130-1
26	31/07/15	Replace EREC G59/3-1 with EREC G59/3-2 in Annex 1
27	01/10/15	Modification to DPC 6.2 Replace reference to G12/4 (2013) with G12/4-1(2015) Following publication of a separate user friendly Distribution Code Summary Guideance document the Guide section has been removed from the Code.
28	01/05/17	Modification to DIN 2.1 – addition of (b) iv) Modification to DOC5 and DOC7 to ensure it is compliant with the EU Network Code "Transmission System Operation Guidelines" (TSOG). The TSOG is expected to enter into force in summer 2017 and some parts of it are effective immediately. These changes are intended to ensure compliance with the TSOG on its entry into force.
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

END