

THE DISTRIBUTION CODE OF LICENSED DISTRIBUTION NETWORK OPERATORS OF GREAT BRITAIN

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ABRIDGED VERSION FOR DCRP/MP/22/02 CONSULTATION

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).
<u>Anchor</u>	<u>Associated with the ability of a Restoration Service Provider's generating Plant to Start-Up from Shutdown and to energise a part of the Total System upon instruction from the DNO or from NGESO or a relevant Transmission Licensee within a defined time period, without an external electrical power supply.</u>
<u>Anchor Power Generating Module Test</u>	<u>A test carried out on an Anchor Power Generating Module at an Anchor Power Station while that Power Station remains energized from an external alternating current electrical supply.</u>
<u>Anchor Power Station Test</u>	<u>A test carried out by an Anchor Generator on an Anchor Power Generating Module while that Anchor Power Station is disconnected from all external electrical power supplies from the DNO's Distribution System.</u>
Annex 1 Standard	A electricity industry national standard that implements Distribution Code requirements 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. <u>It includes Users' equipment which imposes Demand on the DNO's Distribution System.</u>
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 time which 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 NGESO's Transmission Licence .
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	See System Restoration. The procedure necessary for a recovery from a Total Shutdown or Partial Shutdown.
Black Start Station	See Anchor Power Station. A Power Station which is registered pursuant to a CUSC Bilateral Agreement with NGESO, as having a Black Start Capability.
<u>Block Loading Capability</u>	<u>The incremental Active Power steps, from no load to Registered Capacity, which an Anchor Power Generating Module or relevant Restoration Service Providers' Plant can <u>instantaneously supply without causing it to trip or go outside the Frequency range of 47.5 – 52Hz, assuming the initial Frequency is 50.0Hz (or another Frequency range as otherwise agreed). The time between each incremental step shall also be defined by the relevant Restoration Service Provider.</u></u>
Business Day	Any day other than a Saturday, a Sunday, Christmas Day, Good Friday, or a day that is a bank holiday within the meaning of the Banking and Financial Dealings Act 1971.
CENELEC	European Committee for Electrotechnical Standardisation.
Citizens Advice (CA)	National Association of Citizens Advice Bureaux
Citizens Advice Scotland (CAS)	Scottish Association 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 NGESO's Transmission Licence .
CUSC Bilateral Agreement	An agreement pursuant to the CUSC Framework Agreement made between NGESO 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 NGESO'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 CWOOG	A Customer with one or more Power Generating Modules 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 Power Generating Modules or other Entry Points to the points of delivery to Customers 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 .
De-energise	The deliberate movement of any switch or the removal of any fuse or the taking of any other step whereby no electrical current can flow between the DNO's Distribution System and the User's Equipment at the Connection Point (and "De-energisation" shall be construed accordingly.)
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: <ul style="list-style-type: none"> (a) Customer voltage reduction initiated by the DNO (other than following an instruction from NGESO); (b) Customer Demand reduction by disconnection initiated by the DNO (other than following an instruction from NGESO); (c) Demand reduction instructed by NGESO; (d) automatic low frequency Demand disconnectionn; (e) emergency manual Demand disconnection
Demand Control Notification Level	The level above which the DNO has to notify NGESO of its proposed or achieved use of Demand Control which is 12 MW in England and Wales and 5 MW in Scotland.

Demand Facility	An installation under the control of a Customer where electrical energy is consumed and is connected at one or more Connection Points to the DNO's Distribution System .
Demand Services Provider	A party who contracts with the DNO to provide a demand side service. The party might be a Customer contracting bilaterally with the DNO for the provision of services, or may be a third party providing an aggregated service from many individual Customers . In the latter case there will be a specific contract for the provision of the services to the DNO and will include compliance by that third party with the requirements of DPC9 in relation to each Demand Unit included in the aggregated service.
Demand Unit	<p>An appliance or a device whose Active Power Demand or Reactive Power production or consumption is being actively controlled by the Customer in whose Demand Facility it is installed and which has been commissioned on or after 18 August 2019 in pursuance of a contract to this end with the DNO.</p> <p>Such an appliance or device commissioned before this date, but which has been materially altered will also be included in this definition.</p> <p>Where there is more than one Demand Unit in a Demand Facility, these Demand Units shall together be considered as one Demand Unit if they cannot be operated independently from each other.</p> <p>Demand Units of Customers where the Customer has concluded a final and binding contract for the purchase of a Demand Unit before 07 September 2018 are not included the scope of DPC9. The Customer must have notified the DNO of the conclusion of this final and binding contract by 07 March 2019.</p>
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	<p>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:</p> <p>(a) the distribution of electricity through the DNO's Distribution System, including any business in providing connections to such System; and</p> <p>(b) the provision of Distributor Metering and Data Services as defined in the Distribution Licence.</p>
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 Compliance Practice	The process set out in DGC12.5.
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 .
<u>Distribution Restoration Service Contract</u>	<p><u>An agreement between a Restoration Service Provider, NGESO and the DNO:</u></p> <p>(a) <u>under which the Restoration Service Provider provides Anchor Power Generating Module Capability to energize a Distribution Restoration Zone, or</u></p> <p>(b) <u>in a Top Up Service Contract to contribute to the establishment of a Distribution Restoration Zone.</u></p>
<u>Distribution Restoration Zone</u>	<p>Part of a DNO's System, which is arranged to be energised by an <u>Anchor Power Generating Module</u> when that part of the <u>DNO's Distribution System</u> is not connected to the <u>National Electricity Transmission System</u>, for example following a <u>Total System Shutdown or Partial System Shutdown</u>. The <u>Distribution Restoration Zone</u> shall comprise an <u>Anchor Power Generating Module</u> and may also include the <u>Plant and Apparatus</u> of one or more <u>Restoration Service Providers</u>.</p> <p>The <u>Distribution Restoration Zone</u> is primarily comprised of part of the <u>DNO's Distribution System</u>, but may include relevant parts of the <u>National Electricity Transmission System</u> as provided for in the <u>Distribution Restoration Zone Plan</u>.</p>

**Distribution
Restoration Zone
Control System**

A mains independent automatic control and supervisory system which assesses the **Equipment** status and operational conditions of a **DNO's Distribution System** for the purposes of instructing **Anchor Generators' Power Generating Modules** and **Restoration Service Providers' Plant** and operating items of the **DNO's Equipment** for the purposes of establishing and running a **Distribution Restoration Zone**.

**Distribution
Restoration Zone Plan
(DRZP)**

A plan produced under DOC9.4.6 detailing the agreed method and procedure by which the **DNO** will instruct an **Anchor Generator** to energise part of the **DNO's Distribution System**, which together with other **Restoration Service Providers**, will be able to meet appropriately sized blocks of local **Demand** so as to form a **Power Island**.

A **Distribution Restoration Zone Plan** falls outside the provisions of a **Local Joint Restoration Plan**.

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.

Effective Date

The effective date specified in the relevant modification to the **Distribution Code**, which may be after the implementation date of the modification to allow time for **Users** to make any arrangements that may be necessary in order to comply with that modification.

**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 **Power Generating Modules** 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
Transmission 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 relevant 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.
G59 3/7 Modification	The modification to the Distribution Code to implement Engineering Recommendation G59 Issue 3 Amendment 7, as approved by the Authority on 5 August 2019.

Generator	<p>A person who generates electricity under licence or exemption under the Act.</p> <p>A person who has connected a Power Generating Module(s) in accordance with Item 8 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”) or with Item 9 Engineering Recommendation G98 (Requirements for the connection of type-tested micro generators (up to and including 16 A per phase) in parallel with public low voltage distribution networks on or after 27 April 2019) and where this is (are) their only Power Generating Module(s), is not classed as a Generator for the purpose of this Distribution Code.</p>
Great Britain or GB	“The landmass of England & Wales and Scotland, including internal waters”.
Grid Code	The code which NGESO 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 standing body comprised of representatives of all the DNOs to carry out the functions referred to in its own Constitution and Rules
IP Completion Day	31 December 2020 as defined in Section 39 of the European Union (Withdrawal Agreement) Act 2020.
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	As defined in the Grid Code .
Legally Binding Decisions of the European Commission and/or the Agency	Any relevant legally binding decision or decisions of the European Commission and/or the Agency, but a binding decision does not include decision that is not, or so much of a decision as is not, Retained EU Law .
Load Managed Area	Has the meaning given to that term in the Distribution Use of System Agreement .
<u>Loaded</u>	<u>Supplying Active Power to the System. Like terms (ie Deloaded) shall be construed accordingly.</u>
<u>Local Joint Restoration Plan (LJRP)</u>	<u>A plan produced under the Grid Code detailing the agreed method and procedure by which an Anchor Generator will energise part of the Total System and meet appropriately sized blocks of local Demand so as to form a Power Island. A Local Joint Restoration Plan falls outside the provisions of a Distribution Restoration Zone Plan.</u>
Low Voltage or LV	In relation to alternating current, a voltage exceeding 50 volts but not exceeding 1 000 volts.
Manufacturers' Information	Information in suitable form provided by a manufacturer in order to demonstrate compliance with one or more of the requirements of the Distribution Code . Where equipment certificate(s) as defined in Retained EU Law (Commission Regulation (EU) 2016/631, (Network Requirements for Connections of Generators)), or (Commission Regulation (EU) 2016/1388 (Network Code on Demand Connection)) cover all or part of the relevant compliance points, the equipment certificate(s) demonstrate compliance without need for further evidence for those aspects within the scope of the equipment certificate
Maximum Generation	The additional output obtainable from a Power Generating Module 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 NGET'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 Power Generating Module 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	As defined in the Grid Code .
NGESO	National Grid Electricity System Operator Limited.
NGET	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 NGESO 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 NGET , NGESO , SPT and SHETL .
Offshore Transmission System	Has the meaning set out in the Grid Code .
Onshore Transmission Licensees	NGET , 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 NGESO's directions relating to a Black Start <u>System Restoration</u> .
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 a Power Generating Module , its constituent units (eg generating transformer) or parts, or a relevant part of a User's System 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 Generating Module	Any Apparatus which produces electricity.
Power Island	Power Generating Modules at an isolated Power Station , together with complementary local Demand . In Scotland a Power Island may include more than one Power Station .
Power Station	A Power Generating Facility .
Power Generating Facility	An installation comprising one or more Power Generating Modules (even where sited separately) and/or controlled by the same Generator and which may reasonably be considered as being managed as one Power Generating Facility .
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	<p>Electrical standards in use by DNOs and included in the Distribution Code Review Panel's governance procedures, and falling into one of the categories below:</p> <ul style="list-style-type: none"> (a) Annex 1 Standard (b) Annex 2 Standard (c) Individual DNO Standard.
<u>Quick Re-synchronization</u>	<u>The capability of a Power Generating Module to Re-Synchronize to the System in a relatively short time under conditions defined in the Grid Code.</u>
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	<p>The normal full load capacity of a Power Generating Module 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.</p> <p>For Power Generating Modules connected to the DNO's Distribution System via an inverter, the inverter rating is deemed to be the Power Generating Module's rating.</p>
Registered Data	Data referred to in the schedules to the Distribution Data Registration Code .
Remote Transmission Assets.	<p>Any Plant and Apparatus or meters owned by NGET which:</p> <ol style="list-style-type: none"> are Embedded in the DNO's Distribution System and which are not directly connected by Plant and/or Apparatus owned by NGET to a sub-station owned by NGET; and are by agreement between NGET and the DNO operated under the direction and control of the DNO.
Requesting Control Person	Pursuant to DOC8, the person requesting Safety Precautions at an Operational Boundary .
<u>Restoration Plan</u>	<u>A LJRP or DRZP as the context requires.</u>
<u>Restoration Service Provider</u>	<u>A Generator or a Customer with a legal or contractual obligation to provide services necessary for recovery from a Total Shutdown or a Partial Shutdown.</u>
<u>Restoration Service Test</u>	<u>An Anchor Plant Test, an Anchor Power Station Test, Quick Re-Synchronisation test or Top Up Restoration Plant Test.</u>
Retained EU Law:	As defined in the European Union (Withdrawal) Act 2018 as amended by the European Union (Withdrawal Agreement) Act 2020.
Retrospective Modification	<p>A modification to the Distribution Code shall be a Retrospective Modification, if the modification is either:</p> <ol style="list-style-type: none"> Stated to be a Retrospective Modification in the relevant Distribution Code Modification Report to the Authority; or A G59/3-7 Modification.
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 Power Generating Modules .
Secretary of State	Has the same meaning as in the Act .
SHETL	Scottish Hydro-Electric Transmission Limited
<u>Shutdown</u>	<u>The condition of a Power Generating Module, including its auxiliaries, where there is no energy conversion occurring, there is no Active Power output and there can be no Active Power output until the Power Generating Module is deliberately and actively returned to a state of readiness.</u>
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	As defined in the Grid Code .
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.

Synchronized

The condition where **Power Generating Module** is connected to a **System** so that the **Frequencies** and phase relationships of that **Power Generating Module** and the **System** to which it is connected are identical. Like terms shall be construed accordingly; eg “Synchronism”, “De-Synchronized”, Re-Synchronized.”

It is also used to describe the condition where a **Customer’s Apparatus** is consuming electricity supplied from the **System**.

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 Restoration

The procedure necessary for a recovery from a **Total Shutdown** or **Partial Shutdown**.

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.

Target Frequency

That **Frequency** determined by **NGESO** as the desired operating **Frequency** of the **Total System**, or or a relevant **Power Island**. This will normally be 50.00Hz plus or minus 0.05 Hz, except in exceptional circumstances as determined by **NGESO**, when this may be between 49.90 Hz or 50.10 Hz. An example of exceptional circumstances may be during a recovery from a **Total Shutdown** or **Partial Shutdown**.

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.

<u>Top Up Restoration Contract</u>	<u>A commercial contract between a Top Up Restoration Service Provider and the DNO and NGESO to provide a service (other than Anchor Plant Capability) used to facilitate part of a Distribution Restoration Zone Plan.</u>
<u>Top Up Restoration Service Provider</u>	<u>A Restoration Service Provider with a Top Up Restoration Contract.</u>
<u>Top Up Restoration Test</u>	<u>A test conducted on a Top Up Restoration Service Provider's Plant to confirm it is capable of meeting the requirements of a Top Up Restoration Contract.</u>
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 NGESO's directions relating to a <u>Black Start System Restoration.</u>
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, Offshore Transmission Licensee or NGESO.
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**.

ANNEX 1 - QUALIFYING STANDARDS

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

Distribution Code Requirements Implemented via Electricity Supply Standards

Copies of the following Engineering Recommendations and Technical Specifications are freely available from the **Distribution Code** website at <http://www.dcode.org.uk/> or from Energy Networks Association, 4 More London Riverside, London SE1 2AU, <http://www.energynetworks.org/>. A copy of Engineering Memorandum PO-PS-037 is available from Scottish Hydro Electric Power Distribution Ltd on request.

- 1 **Engineering Recommendation G5 Issue 5**
Harmonic voltage distortion and the connection of harmonic sources and/or resonant plant to transmission systems and distribution networks in the United Kingdom.
- 2 **Engineering Recommendation G59 Issue 3 Amendment 7**
Recommendation for the connection of generating plant to the distribution systems of licensed distribution network operators
- 3 (a) **Engineering Recommendation P2 Issue 7**
Security of Supply.
 (b) **PO-PS-037**
Distribution planning standards of voltage and of security of supply. (Parts of Scottish Hydro Electric Power Distribution Ltd Area).
- 4 **Engineering Report 130 Issue 3**
Guidance on the application of Engineering Recommendation P2, Security of Supply
- 5 **Engineering Recommendation P24**
AC traction supplies to British Rail.
- 6 **Engineering Recommendation P28 Issue 2**
Voltage fluctuations and the connection of disturbing equipment to transmission systems and distribution networks in the United Kingdom.
- 7 **Engineering Recommendation P29**
Planning limits for voltage unbalance in the United Kingdom for 132kV and below.
- 8 **Engineering Recommendation G83 Issue 2 Amendment 3**
Recommendations for the connection of type tested Small-Scale Embedded Generators (up to 16 A Per Phase) in parallel with low-voltage distribution systems.
- 9 **Engineering Recommendation G98 Issue 1 Amendment ~~87~~**
Requirements for the connection of type-tested micro generators (up to and including 16 A per phase) in parallel with public low voltage distribution networks on or after 27 April 2019.
- 10 **Engineering Recommendation G99 Issue 1 Amendment ~~910~~**
Requirements for the connection of generating equipment in parallel with public distribution networks on or after 27 April 2019.

DISTRIBUTION PLANNING AND CONNECTION CODE 6**DPC6 TECHNICAL REQUIREMENTS FOR CONNECTIONS**

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DPC6.7 Communications and Telemetry Equipment

DPC6.7.1 All Users shall ensure that all the communication and telemetry Equipment is cyber secure.

DPC6.7.2 Where Users are Restoration Service Providers, the User's facilities referred to in this DPC6.7 shall be provided with resilient back up power sources that will allow all communication and telemetry Equipment to operate for at least 72 hours following the start of the Total Shutdown or Partial Shutdown.

DPC6.7.~~13~~ 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.~~24~~ 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.~~35~~ 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**. Restoration Service Providers shall be capable of providing additional telemetry information as required by their Distribution Restoration Service Contract.

DPC6.7.~~64~~ 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.

DPC6.7.75 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.

DPC6.7.86 Data Entry Terminals

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

DPC6.7.97 System Monitoring

Monitoring equipment is provided on the **DNO's Distribution System** to enable the **DNO** to monitor dynamic performance conditions. **Power Generating Modules** and **Power Generating Facilities** 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**.

For **Power Generating Modules** commissioned on or after 27 April 2019, additional monitoring equipment in accordance with Engineering Recommendation G99, as applicable, shall be provided by the **Generator**.

DPC7.4.6.8 Black Start System Restoration Capability

DPC6.8.1 Two principal recovery routes from a **Total Shutdown** or **Partial Shutdown** exist, via **Local Joint Restoration Plans**, and via **Distribution Restoration Zone Plans**. Their requirements are described in detail in DOC9.

DPC6.8.2 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 ~~shall~~ notify the **DNO** if its **Power Generating Module** has a restart capability without connection to an external power supply, unless the **Embedded Generator** ~~shall have~~ **has** previously notified **NGESO** accordingly under the ~~-Grid Code~~. Such generation may be registered by **NGESO** as an ~~**Black Start Station**~~ **Anchor Power Station** for **LJRPs**, or registered by **NGESO** and the **DNO** in the case of **Anchor Power Stations** for **DRZPs** ~~**Black Start Station**~~.

DPC6.8.3 **DRZPs** may also include other **Restoration Service Providers** as parties in addition to **Anchor Generators**. All **Restoration Service Providers'** relevant **Plant** and **Equipment** shall be provided with resilient back up power sources that will allow all the **Plant** and **Equipment** to operate autonomously, or be operated remotely, for at least 72 hours following the start of the **Total Shutdown** or **Partial Shutdown**. In these cases the **DNO** will generally provide power resilient communications to the **Anchor Power Station** or site of the **Restoration Service Provider's** plant, unless specifically agreed otherwise. The **Anchor Generator** and **Restoration Service Provider** must ensure that all the communications between the **DNO's** telemetry outstation, or the **DNO's** other terminal equipment, and the **Restoration Service Provider's Apparatus** are also resilient to mains power loss for at least 72 hours. The communication equipment shall always include the facility for resilient voice communication.

- DPC6.8.4 **Restoration Service Providers** shall ensure that all their **Plant** and **Apparatus** is secure against cyber attack and intrusion consistent to a level consistent with that of critical national infrastructure.
- DPC6.8.5 **Restoration Service Providers** shall have the ability to switch to alternative **Protection** settings on their **Plant** and **Apparatus** if they are required to do so to be able to satisfy their obligations of a **DRZP**. Any alternative settings shall be agreed with the **DNO** as part of the **DRZP**.
- DPC6.8.6 **Restoration Service Providers** shall have the ability to switch to alternative control scheme settings on their **Plant** and **Apparatus** if they are required to do so to be able to satisfy their obligations of a **DRZP**. Any alternative settings shall be agreed with the **DNO** as part of the **Distributed Restoration Zone Plan**.
- DP6.8.6 **Restoration Service Providers** shall ensure that all their control systems essential for managing their **Plant** are sufficiently robust and capable of handling all the alarms and other data that will be generated in high volume during a **System Restoration**, without any degradation of capability.

DISTRIBUTION PLANNING AND CONNECTION CODE 7

DPC7 REQUIREMENTS FOR EMBEDDED GENERATORS

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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~~**Re-Synchronisation** with the rest of the **DNO's Distribution System** then the **Embedded Generator** will under **DNO** instruction, ensure that the **Power Generating Module** and/or **Embedded Transmission System** is disconnected for ~~re-synchronisation~~**Re-Synchronisation**.

~~DPC7.4.8 Black Start Capability~~

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

DPC7.4.98 Commissioning Tests

DPC7.4.98.1 Where **Power Generating Module** or an **Embedded Transmission System** requires connection to the **DNO's Distribution System** in advance of the commissioning date, for the purposes of testing, the **Embedded Generator** must comply with the requirements of the **Connection Agreement**. The **Embedded Generator** shall provide the **DNO** with a commissioning programme, approved by the **DNO** if reasonable in the circumstances, to allow commissioning tests to be co-ordinated.

DPC7.4.98.2 The **Generator** will demonstrate all the commissioning tests performed on his **Power Generating Module** in order to discharge the requirements of the **Distribution Code** and Annex 1, item 2 (ER G59/3-7 or subsequent amendment). In general the **DNO** will witness these tests for **Power Generating Modules** connected to the **DNO's Distribution System** at **HV**. For **Power Generating Modules** connected to the **DNO's Distribution System** at **Low Voltage** it is expected that the **DNO** will not witness the commissioning tests in the majority of cases.

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DISTRIBUTION OPERATING CODE (DOC)**DISTRIBUTION PLANNING AND CONNECTION CODE 8****DPC8 TRANSFER OF PLANNING DATA**

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DPC8.11 Distribution Restoration Zone Related Information

DPC8.11.1 Data identified under this DPC8.11 must be submitted by **Restoration Service Providers** as part of the establishment of a **Distribution Restoration Zone Plan**, as described in DOC9.4.6, and on subsequent request from the **DNO** for it to be refreshed.

DPC8.11.2 This information may also be requested by the **DNO** during the establishment of a **Distribution Restoration Zone** and shall be provided by **Restoration Service Providers** where reasonably practicable.

DPC8.11.3 The following information must be supplied from each **Restoration Service Provider** in relation to each relevant item of **Plant** which is identified in the **DRZP**:

(a) From each **Anchor Generator** and each other **Restoration Service Provider** the estimated time by when each item of relevant **Plant** identified in the **DRZP** can be **Synchronised** in response to an instruction following a **Total Shutdown** or **Partial Shutdown**. The estimate should reflect the **Anchor Generator's** and **Restoration Service Provider's** ability to **Re-synchronise** all their **Plant**, assuming all were running immediately prior to the **Total Shutdown** or **Partial Shutdown**. Additionally, the estimate should highlight any specific issues (ie those that would affect the time at which the **Anchor Power Generating Module** and **Restoration Service Provider's Plant** could be **Synchronised**) that may arise, as time progresses without external supplies being restored.

(b) The **Block Loading Capability** of the relevant **Plant** shall be provided in either graphical or tabular format showing the estimated **Block Loading Capability** from 0MW to the **Plant's Registered Capacity**. Any particular **Active Power** loading points at which the **Anchor Generator's Power Generating Module** or **Restoration Service Provider's Plant** should be operated until further changes in output can be accommodated, and the time between those changes, should also be identified.

The data of each **Anchor Power Generating Module** and **Restoration Service Provider's Plant** identified in a **DRZP** should be provided for the condition of the **Anchor Power Generating Module** or **Restoration Service Provider's Plant** which are considered as both 'hot' units (that were **Synchronised** immediately prior to the **Total** or **Partial Shutdown**) and cold units (not run for 48 hours or more prior to the **Total** or **Partial Shutdown**). The **Block Loading Capability** assessment should be done against a frequency variation of 49.5Hz – 50.5Hz, assuming an initial 50Hz frequency (or other such frequency range as may be agreed).

DPC8.12 More Detailed Information

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

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 **NGESO**, 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**.

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 Power Generating Modules** 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**.

(e) Any User in (a) to (c) above who are **Distribution Restoration Service Providers.**

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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 Power Generating Module** 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 Power Generating Modules** 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**.

DOC2.6.3.4 Restoration Service Providers must notify the DNO immediately of any changes to the availability of their Plant and Equipment which might affect their ability to discharge the obligations of their Distribution Restoration Service Contract.

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 Power Generating Modules** 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 **Power Generating Module** 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.

DOC2.6.5.3 Restoration Service Providers must notify the DNO immediately of any changes to the availability of their Plant and Equipment which might affect their ability to discharge the obligations of their Distribution Restoration Service Contract.

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

DOC2.6.6.1 During the real time **Operation** any changes to the outage programme for the day shall be at the discretion of the **DNO**.

DOC2.6.6.2 Restoration Service Providers must notify the DNO within 30 minutes of any changes to the availability of their Plant and Equipment which might affect their ability to discharge the obligations of their Distribution Restoration Service Contract over the subsequent 5 days from the identification of the issue.

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 **Generators** who are 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**.

DOC5.2.2 This DOC5 includes the necessary arrangements and actions to establish that certain Restoration Service Providers can provide the System Restoration services that they have contracted to provide in accordance with OC9 of the Grid Code and this DOC9.

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**.

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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 **NGESO's** reasonable satisfaction, **NGESO** 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 **NGESO** 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 **NGESO**, 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 **Power Generating Modules** comprising part of the relevant **Embedded Medium Power Station** should only be to demonstrate that:

- (a) the relevant **Power Generating Module** meets the requirements of the paragraphs in the **Grid Code** Connection Conditions or the **Grid Code** European Connection Conditions (as applicable) which are applicable to such **Power Generating Modules** or **Power Station**; or
- (b) the relevant **Power Generating Module** meets the requirements for operation in limited frequency sensitive mode as describe in the **Grid Code** in accordance with CC.6.3.3 (or ECC6.3.3), 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 **NGESO**, **NGESO** 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 **Power Generating Module** 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 **NGESO** 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 **Power Generating Module** concerned will be recorded at **NGESO** 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 **Power Generating Module** will be recorded on a suitable recorder (with measurements taken as appropriate on the **Power Generating Module** Stator Terminals / on the LV side of the generator transformer or at the **Connection Point** if this has been agreed between the **DNO** and the **Generator**) in the relevant **User's Control Centre**, in the presence of a reasonable number of representatives appointed and authorised by **NGESO**. If **NGESO** 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 **Power Generating Module** concerned fails to pass the test the **Generator** must provide the **DNO** and **NGESO** 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 **NGESO**. This report must be provided within five **Business Days** of the test. If a dispute arises relating to the failure, **NGESO**, 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 **NGESO** 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 **NGESO** 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 **NGESO** 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 **Power Generating Module** in **NGESO's** view fails to pass the re-test and a dispute arises on that re-test, **NGESO**, 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 **Power Generating Module** has failed the test or re-test (as applicable), the **Generator** shall within 14 days, or such longer period as **NGESO** may reasonably agree, following such failure, submit in writing to the **DNO** for submission to **NGESO** for approval the date and time by which the **Generator** shall have brought the **Power Generating Module** concerned to a condition where it complies with the relevant requirement.

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

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

DOC5.6.6.4 Once the **Generator**, has indicated to **NGESO** via the **DNO** the date and time that the **Power Generating Module** can achieve the parameters previously registered or submitted, **NGESO** 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.

DOC5.7 System Restoration Testing

DOC5.7.1 Introduction

DOC5.7.1.1 Two principal recovery routes from a Total Shutdown or Partial Shutdown exist: via Local Joint Restoration Plans, and via Distribution Restoration Zone Plans. Their requirements are described separately in DOC9.

DOC5.7.1.1 This DOC5.7 deals with the testing requirements for DRZPs only. Testing of LJRP is undertaken under the direction of NGESO in accordance with OC5 of the Grid Code.

DOC5.7.2 General Requirements

- DOC5.7.2.1 NGESO may request the DNO in coordination with a Restoration Service Provider to carry out the appropriate Restoration Service Test in order to demonstrate that Restoration Service Providers' Plant have the appropriate capabilities. Prior to any test taking place, the DNO shall ensure the DNO's Distribution System is appropriately configured to undertake the test.
- DOC5.7.2.2 NGESO will request the DNO to instruct the relevant Restoration Service Provider to carry out a test (an Anchor Power Generating Module Test, an Anchor Power Station Test, a Top Up Restoration Test; or a Quick Resynchronization test as appropriate) in order to demonstrate the relevant capabilities.
- DOC5.7.2.3 All Restoration Service Tests shall be carried out at the time agreed between the DNO, the Restoration Service Provider and NGESO and in the notice periods given in DOC5.7.2.6. The tests shall be undertaken in the presence of a reasonable number of representatives appointed by NGESO and/or the DNO, who shall be given access to all information relevant to the Restoration Service Test.
- DOC5.7.2.4 When NGESO wishes the DNO to instruct an Restoration Service Provider to carry out an Restoration Service Test, the DNO shall notify the details of the proposed Restoration Service Test to the relevant Restoration Service Provider at least 7 days prior to the time of the Restoration Service Test.
- DOC5.7.2.5 NGESO may request the DNO to instruct an Restoration Service Provider to carry out an Restoration Service Test at any time (but will not require an Restoration Service Test to be carried out more than once in each calendar year in respect of any particular Restoration Service Provider's Plant unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test).
- DOC5.7.2.6 For Anchor Generators, when an Anchor Power Generating Module is required to undertake Anchor Plant Tests, the following shall apply:
- (a) Where NGESO requests the DNO to instruct an Anchor Generator to carry out an Anchor Power Generating Module test, on each Anchor Power Generating Module, within an Anchor Power Station, the Anchor Generator shall execute such a test at least once every three calendar years. NGESO will not require the DNO to instruct an Anchor Power Generating Module test to be carried out on more than one Anchor Power Generating Module at that Anchor Power Station at the same time, and would not, in the absence of exceptional circumstances, expect any of the other Anchor Power Generating Modules at the Anchor Power Station to be directly affected by the Anchor Power Generating Module test.
 - (b) NGESO may occasionally require the DNO to instruct an Anchor Generator to carry out an Anchor Power Station Test at any time (but will not require an Anchor Power Station Test to be carried out more than once in every three calendar years in respect of any particular Anchor Power Generating Module unless it can reasonably justify the necessity for further tests or unless the further test is a re-test). If successful, this Anchor Power Station Test shall count as a successful Anchor Power Generating Module Test for the Anchor Power Generating Module used in the test.

- (c) If a **Distribution Restoration Contract** includes **Quick Resynchronization**, **NGESO** may occasionally require the **DNO** to instruct the **Anchor Generator** to carry out a **Quick Re-synchronisation Unit Test** at any time, but will generally only be required where such an **Anchor Generator** has made a change to its **Plant** and **Apparatus** which has an impact on its houseload operation or after two unsuccessful tripping **Events** in the operational environment.

Tests (a) to (c) will be deemed a success where stable operation is achieved within a time frame agreed in the **Distribution Restoration Service Contract**.

DOC5.7.3 System Restoration Service Tests

DOC5.7.3.1 Anchor Power Generating Module Testing General Requirements

DOC5.7.3.1.1 All tests shall be instructed and coordinated by the **DNO**. The **DNO** shall inform **NGESO** of the progress and completion of the tests following the relevant requirements of **Grid Code OC5.7**.

DOC5.7.3.1.2 All tests should demonstrate compliance with the technical requirements listed in included in Appendix 1 of DPC7, or as amended in the **Distribution Restoration Service Contract**.

DOC5.7.3.2 Anchor Power Generating Module Test

- (a) Prior to the test, the **DNO** shall reconfigure the **DNO's Distribution System** to enable the **Anchor Power Generating Module Test** to be completed whilst having due regard for the safety of plant and personnel on its **Distribution System**.
- (b) The relevant **Anchor Power Generating Module** shall start the test sequence **Loaded** in normal operation.
- (c) All the auxiliary power sources used in the **Anchor Power Station** which relate to the relevant **Anchor Power Generating Module** is situated, shall be **Shutdown**.
- (d) The **Anchor Power Generating Module** shall be **Deloaded**, de-**Synchronised** and **Shutdown** and all alternating current electrical supplies to its auxiliaries shall be disconnected.
- (e) The auxiliary power sources for the relevant **Anchor Power Generating Module** shall be made available, and shall re-energise the electrical systems of the relevant **Anchor Power Generating Module**.
- (f) The auxiliaries of the relevant **Anchor Power Generating Module** shall be fed by the auxiliary power supplies to enable the relevant **Anchor Power Generating Module** to return to a condition where it is ready to **Synchronize**.
- (g) Where required by the **DNO** and in accordance with the **DRZP** the test shall be arranged such that the relevant **Anchor Power Generating Module** shall energize the dead sections of network as required in the plan.
- (h) Where required by the **DNO** and in accordance with the **DRZP** the test shall be arranged such that a relevant part of the **DNO's Distribution System** energized by the **Anchor Power Generating Module** shall be **Synchronized** to the rest of the **DNO's Distribution System**.

- (j) The relevant **Anchor Power Generating Module** shall be **Synchronised** but not **Loaded**, unless the appropriate instruction has been specifically given to the **Anchor Generator** by the **DNO**, following instruction from **NGESO** to the **DNO** under BC2 of the **Grid Code** which would also be in accordance with the requirements of the **DRZP** and **Distribution Restoration Service Contract**.
- (k) When planning and/or executing a dead line charge test, consideration shall be given to the effect the test will have on **Customers** supplied from the part of the **Total System** that needs to be de-energised for the test. Consideration should include whether supplies to **Customers** would need to be interrupted to undertake the test. Where possible, tests should be conducted to avoid interruption to **Customers'** supplies. Where this is not possible, alternative tests or computer simulation exercises can be agreed between the **DNO**, **NGESO**, the relevant **Transmission Licensee** (as applicable) and the **Restoration Service Provider**. Where it is identified that routine testing which is critical to restoration of the **Total System** cannot be undertaken, because of the effect on **Customers'** supplies, consideration should be given to network reconfiguration where such a change is technically and economically viable.
- (m) **NGESO** and the **DNO** shall agree with the **Anchor Generator** when the test has been completed in accordance with the test requirements of the **DRZP**.

DOC5.7.3.3 Anchor Power Station Test

- (a) Prior to the test, the **DNO** shall reconfigure the **DNO's Distribution System** as necessary to enable the **Anchor Power Station Test** to be completed whilst having due regard for the safety of plant and personnel on its **Distribution System**.
- (b) All **Anchor Power Generating Modules** at the **Anchor Power Station**, other than the **Anchor Power Generating Module** on which the **Anchor Power Generating Module Test** is to be carried out, and all the auxiliary power supplies at the **Anchor Power Station**, shall be **Shutdown**.
- (c) The relevant **Anchor Power Generating Module** shall start the test sequence **Loaded** in normal operation.
- (d) The relevant **Anchor Power Generating Module** shall be **Deloaded** and **De-synchronised**.
- (e) All external alternating current electrical supplies to the electrical systems of the relevant **Anchor Power Generating Module**, and to the **Power Station** electrical installation of the relevant **Anchor Power Station**, shall be disconnected.
- (f) An independent auxiliary power supply at the **Anchor Power Station** shall be used to re-energise either directly, or via the **Power Station** electrical installation, the electrical supplies to the relevant **Anchor Power Generating Module**.
- (g) The provisions of DOC5.7.3.2 (f) through to (k) shall thereafter be followed.

- (h) NGESO and the DNO shall agree with the Anchor Generator when the test has been completed in accordance with the test requirements of the DRZP.

DOC5.7.3.4 Quick Re-synchronisation Unit Test

- (a) If required by the Distribution Restoration Service Contract, the Quick Re-synchronisation Unit Test will be included as part of the Anchor Power Generating Module Test. The following requirements apply:
- i. In case of disconnection of the Anchor Power Generating Module from the System, the Power Generating Module shall be capable of quick re-synchronisation in line with the Protection strategy agreed between the DNO and Anchor Generator in co-ordination with NGESO;
 - ii. An Anchor Power Generating Module with a minimum re-synchronisation time greater than 15 minutes after its disconnection from any external power supply must be capable of houseload operation from any operating point on its Anchor Power Generating Module performance chart. In this case, the identification of houseload operation must not be based solely on switchgear position signals;
 - iii. Anchor Power Generating Modules shall be capable of houseload operation, irrespective of any auxiliary connection to the Total System. The minimum operation time shall be specified by DNO, in liaison with NGESO, taking into consideration the specific characteristics of prime mover technology.
- (b) The tests shall be performed as follows:
- i. The relevant Anchor Power Generating Module shall be Synchronised and Loaded;
 - ii. All the auxiliary power sources used at the Anchor Power Power Station in which that Anchor Power Generating Module is situated shall be Shutdown.
 - iii. The Anchor Power Generating Module shall be tripped to house load.
 - iv. The relevant Anchor Power Generating Module shall be Synchronised but not Loaded, unless so instructed by the DNO.
 - v. NGESO and the DNO shall agree with the Anchor Generator when the test has been completed in accordance with the test requirements of the DRZP.

DOC5.7.3.5 Tests for other Restoration Services

- (a) Prior to the test, the DNO will reconfigure its System as necessary to enable the test of the relevant Plant and Apparatus to be completed whilst having due regard for the safety of plant and personnel on its System.
- (b) The relevant Plant and/or Apparatus shall be operating normally, ie in the operational state it is anticipated to be in if a Shutdown were to occur;
- (c) All the auxiliary power supplies which relate to the relevant Plant and/or Apparatus shall be Shutdown.

- (d) The **Plant** and/or **Apparatus** shall be **De-Loaded, De-Synchronised and Shutdown** as appropriate and all alternating current electrical supplies to its auxiliaries shall be disconnected.
- (e) The auxiliary power supplies at the to the relevant **Plant** and/or **Apparatus** shall be made available and shall re-energise the **Unit Board** (or equivalent) of the relevant **Plant** and/or **Apparatus**.
- (f) The auxiliaries of the relevant **Plant** and/or **Apparatus** shall be fed by the auxiliary power supplies, via the **Unit Board** (or equivalent), to enable the relevant **Plant** and/or **Apparatus** to return to a condition when it is ready to be reconnected and/or **Synchronised** to the **DNO's System**.
- (g) Relevant **Plant** shall be **Synchronised** but not **Loaded**, unless appropriate instruction has been specifically given to the **Restoration Service Provider** by the **DNO**, following instruction from **NGESO** to the **DNO** under BC2 of the **Grid Code** which would also be in accordance with the requirements of the **DRZP** and **Distribution Restoration Service Contract**.
- (h) The **DNO** and **NGESO** shall agree with the **Restoration Service Provider** when the test has been completed in accordance with the test requirements of the **DRZP**.

DOC5.7.3.6 Restoration Service Providers Power Resilience

- i.) At least every three years all **Restoration Service Providers** shall undertake tests to provide assurance that the resilient back up power supplies necessary for the operation of the **Plant** and **Apparatus** comply with the requirements of DPC7.4.8.3.
- ii.) At least every three years all **Restoration Service Providers** shall provide assurance that all of their **Plant** and **Apparatus** is cybe secure as required by DPC7.4.8.4.

DOC5.7.3.7 Telephony Tests

Restoration Service Providers will initiate an end-to-end function test of the mains independent telephony system between them and the **DNO** at least once in every 12 month period.

DOC5.7.3.8 Distribution Restoration Zone Control System Tests

Where the **DNO** uses a **Distribution Restoration Zone Control System** as part of the implementation of a **DRZP**, the **DNO** shall undertake tests to ensure the correct functioning of the **Distribution Restoration Zone Control System**. These shall include the following:-

- i) that communications systems, including those relevant systems belonging to **Restoration Service Providers**, maintain correct operation when operating in mains independent mode for at least 72 hours.
- ii) that the **Distribution Restoration Zone Control System** is able to reconfigure the **DNO's Distribution System** in response to the appropriate test or simulated signals etc. This functionality shall be

demonstrated as being available for at least 72 hours when operating in mains independent mode.

iii) that the **Distribution Restoration Zone Control System** is able to instruct **Restoration Service Providers Plant** and **Apparatus** (including **Anchor Plant**) in response to the appropriate test or simulated signals etc. This functionality shall be demonstrated as being available for at least 72 hours when operating in mains independent mode.

iv) that the **Distribution Restoration Zone Control System**, in a suitable test configuration, is capable of **Synchronizing** its **Power Island** to the wider system in response to the appropriate test or simulated signals etc, and that the appropriate signals are generated. The testing should include the separate testing of any passive **Synchronizing** equipment on which the **Distribution Zone Restoration Plan** relies.

v) that all the necessary operational metering signals and status of the **DNO's Distribution System** and **Restoration Service Providers' Plant** and **Apparatus** are accurately and appropriately transmitted to **NGESO**.

The **DNO** shall conduct the above tests at least once every three years.

DOC5.7.4 Test Failures/Re-Tests and Disputes

DOC5.7.4.1 The **DNO** is required ensure that **Restoration Service Providers' Plant** and/or **Apparatus** is capable of meeting the requirements of DPC7 Appendix 1 in the **Distribution Code**, the relevant **DRZP** and the associated **Distribution Restoration Service Contracts**.

DOC5.7.4.2 An **Anchor Power Generating Module** shall fail the test if it cannot demonstrate **Anchor Power Generating Plant Capability**.

DOC5.7.4.3 Other **Restoration Service Providers' Plant** or **Apparatus** shall fail the test if it fails to **Synchronise** to the system and to provide the **Active Power** or **Reactive Power** output in accordance with that agreed in the relevant **Distribution Restoration Service Contract**.

DOC5.7.4.4 The **DNO** shall notify **NGESO** where any such failure has an impact on the **DNO's** ability to activate a **Distributed Restoration Zone**.

DOC5.7.4.5 If any **Restoration Service Provider's Plant** or **Apparatus** fails to pass a **Restoration Service Test** the **Restoration Service Provider** must provide the **DNO** and **NGESO** 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 **Restoration Service Provider**. This must be provided within five **Business Days** of the test. If a dispute arises relating to the failure, the **DNO**, **NGESO** and the relevant **Restoration Service Provider** shall seek to resolve the dispute by discussion, and if they fail to reach agreement, the **Restoration Service Provider** may require the **DNO** and **NGESO** to carry out a further **Restoration Service Test** on 48 hours notice which shall be carried out following the procedure set out in sections DOC5.7.3.2 to DOC5.7.3.5 as the case may be, as if the **DNO** and **NGESO** had issued an instruction at the time of notice from the **Restoration Service Provider**.

- DOC5.7.4.6 If the **Restoration Service Provider's Plant Apparatus** concerned fails to pass the re-test and a dispute arises on that re-test, the parties may use the **CUSC Disputes Resolution Procedure** for a ruling in relation to the dispute, which ruling shall be binding.
- DOC5.7.4.7 If following the procedure in DOC5.7.4.5 and DOC5.7.4.6 it is accepted that the **Restoration Service Provider's Plant or Apparatus** has failed the **Restoration Service Test** (or a re-test carried out under OC5.7.2.7), within 14 days, or such longer period as the **DNO** and **NGESO** may reasonably agree, following such failure, the relevant **Restoration Service Provider** shall submit to the **DNO** and **NGESO** in writing for approval, the date and time by which that **Restoration Service Provider** shall have brought the relevant **Plant** back to a suitable state and would pass the **Restoration Service Test**, and the **DNO** and **NGESO** will not unreasonably withhold or delay its approval of the **Restoration Service Provider's** proposed date and time submitted. Should the **DNO** and **NGESO** not approve the **Restoration Service Provider's** proposed date and time (or any revised proposal) the **Restoration Service Provider** shall revise such proposal having regard to any comments the **DNO** and **NGESO** may have made and resubmit it for approval.
- DOC5.7.4.8 Once the **Restoration Service Provider** has indicated to the **DNO** and **NGESO** that the **Restoration Service Provider's Plant** has been restored to a suitable state, the **DNO** and **NGESO** shall either accept this information or require the **Restoration Service Provider** to demonstrate that the relevant **Plant** has its capability restored, by means of a repetition of the **Restoration Service Test** referred to in DOC5.7.2.4 following the same procedure as for the initial **Restoration Service Test**. The provisions of this DOC5.7 will apply to such test.
- DOC5.7.5 Awareness and training
- DOC5.7.5.1 The **DNO** will participate with **NGESO** in regular exercising of **Restoration Plans**. **Restoration Service Providers** shall participate in the tests of those plans in relation to their **Distribution Restoration Service Contracts**.
- DOC5.7.5.2 Notwithstanding other testing requirements, **Restoration Service Providers** will undertake shared desktop training and exercises with the **DNO** and **NGESO** at least once every three years on a per contract basis to confirm:
- i) That **Restoratio Plans** for **System Restoration** are robust and sufficiently able to satisfy the requirements for **System Restoration**.
 - ii) There is a high level of confidence that **Restoration Service Providers** will be able to deliver the service they have contracted to provide.
 - iii) There is a high level of confidence that **Restoration Service Providers' Plant and Equipment** will be able to satisfy the requirements of **DP6.7.2**.
 - iv) There is a high level of assurance that **Restoration Plans** will be capable of contributing to the restoration of those sections of the **System** that they have been designed to re-establish.
 - v) That **Restoration Service Providers** have contingency arrangements in place in order for them receive and act upon instructions issued by **DNO** for a period of upto 72 hours following the loss of site supplies.
 - vi) Ensure all communications systems used satisfy the minimum requirements of **DPC6**.

DOC5.7.5.3 As part of these exercises, **Restoration Service Providers** are required to inform the DNO of any assumptions they make and any reasons why they would be unable to fulfil their obligations.

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DISTRIBUTION OPERATING CODE 9

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 System Restoration**

This **Distribution Operating Code** DOC9 covers the requirements for the implementation of **Black Start System Restoration** recovery procedures following a **Total Shutdown** or **Partial Shutdown** of the **Total System** as recognised by NGESO. The **Black Start System Restoration** 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 NGESO.

NGESO's licence includes the Electricity System Restoration Standard which requires that 60% of national Demand to be restored in GB in 24 hours and 100% of national Demand to be restored in 5 days on the assumption the Total System is sufficiently operable and that Plant and Apparatus has not been subject to extensive damage.

Two principal recovery routes exist, via Local Joint Restoration Plans, and via Distribution Restoration Zone Plans collectively known as Restoration Plans. Their requirements are described separately in this DOC9.

In practice and in order to re-establish the integrity of the Total System and reconnect Demand in as short a time as possible, it is expected that NGESO will activate LJRP and DRZPs in parallel. Any LJRP and/or DRZP comprising common DNO or Restoration Service Provider assets cannot be activated at the same time. However this would not preclude a LJRP or Distributed Restoration Zone Plan from being activated at the same site(s) where there is segregation between them and the assets involved.

DOC9.1.2 Re-synchronising Islands

NGESO will co-ordinate the Resynchronisation of Power Islands in such cases where 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 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.~~ System Restoration.

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 **NGESO** to issue Emergency Instructions and it may be necessary to depart from the normal **Balancing Mechanism** operation in issuing Bid-Offer Acceptances.

DOC9.4.2 Local Joint Restoration Plans

DOC9.4.1.32.1 Certain ~~Embedded~~ **Power Stations** (which may or may not be **Embedded**) are registered by **NGESO**, as having the ability of at least one of its **Power Generating Modules** to start up from ~~shutdown~~ **Shutdown** without connections to external power supplies. Such **Power Stations** are to be referred to as ~~Black Start~~ **Station** Anchor Power Stations.

DOC9.4.1.42.2 For each ~~Black Start Station~~Anchor Power 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 Plan~~LJRPs produced jointly by **NGESO**, ~~other relevant Transmission Licensees~~, the **DNO** and **Generators** and may include **Embedded Generators**. **DNOs** will be party to these Plans irrespective of whether the ~~Black Start Station~~Anchor Power Station is **Embedded**.

DOC9.4.1.52.3 In Scotland a ~~Local Joint Restoration Plan~~LJRP may include more than one ~~Black Start Station~~Anchor Power Station and may be produced with and include obligations on the relevant **Transmission Licensee**, **Generators** responsible for **Power Generating Modules** not at a ~~Black Start Station~~Anchor Power Station and other **Users**. Any instruction to initiate a Local Joint Retoration Plan will be issued to the DNO by the relevant Transmission Licensee.

DOC9.4.3 Distribution Restoration Zone Plans

DOC9.4.3.1 Certain **Embedded Power Stations** are registered by the **DNO** and **NGESO** as having the capability of at least one of its **Power Generating Modules** to start up from **Shutdown** without connections to external power supplies and be able to energize part of the **DNO's Distribution** system within 8 hours. Such **Power Stations** where their owner has a **Distribution Restoration Service Contract** are to be referred to as **Anchor Power Stations**, and their owners as **Anchor Generators**.

DOC9.4.3.2 For each **Anchor Power 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 creation of a **Power Island**. These plans are known as **DRZPs** and are a multi party agreement between **NGESO**, the **DNO**, and the **Restoration Service Providers** (including the **Anchor Generator**) and where appropriate and necessary the relevant **Transmission Licensee**.

DOC9.4.3.3 In Scotland a **DRZP** will be under the direction of the relevant **Transmission Licensee**. Any instruction to activate a **DRZP** will be issued by the relevant **Transmission Licensee**.

DOC9.4.24 ~~Black Start~~ Situations requiring **System Restoration**

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 **NGESO** intends to implement the ~~Black Start~~**System Restoration** procedure.

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

DOC9.4.5 System Restoration

- DOC9.4.35.1 The procedure necessary for a recovery from a **Total Shutdown** or **Partial Shutdown** is known as ~~Black-Start~~System Restoration 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.
- DOC9.4.35.2 The complexities and uncertainties of recovery from a **Total Shutdown** or **Partial Shutdown** require that ~~Black-Start~~System Restoration is sufficiently flexible in order to accommodate the full range of **Power Generating Module** 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 Generating Facilities** 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**.
- DOC9.4.35.3 Where there are no **Power Generating Facilities** with a contracted ~~Black-Start~~System Restoration 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.~~

DOC9.4.6 Restoration Plan Establishment

The following process shall apply for the establishment of Restoration Plans:

- DOC9.4.6.1 For a LJRP, NGESO will identify the need to introduce or modify a LJRP and coordinate with the relevant parties as required in this DOC9.4.6.
- DOC9.4.6.2 For a DRZP where NGESO and the DNO agree that introducing or modifying a Distribution Restoration Zone may be beneficial, the DNO, NGESO, and the relevant Transmission Licensee shall explore the possibility of establishing a DRZP as required in this DOC9.4.6.
- DOC9.4.6.3 The DNO, NGESO and the relevant Transmission Licensee (where appropriate) will discuss and agree the detail of a Restoration Plan as soon as reasonably practicable after the potential requirement for a Restoration Plan is identified. This may involve discussions between relevant potential Restoration Service Providers, the DNO and NGESO.
- DOC9.4.6.4 For a DRZP an initial feasibility assessment carried out jointly by NGESO and the DNO may result in NGESO running a procurement and/or tender process. If after

discussions or analysis, **NGESO**, the **DNO** and the relevant **Transmission Licensee** (where appropriate) agree a **DRZP** is not viable, then no further work to develop the **DRZP** needs to be carried out.

DOC9.4.6.5 Each **Restoration Plan** will be in relation to a specific **Anchor Power Generating Module** and may include the **Plant** and **Apparatus** of one of more **Top Up Restoration Service Providers**.

DOC9.4.6.6 The preparation of each **Restoration Plan** shall include a check whether any network assets cited in each **Restoration Plan** are included in any other **Restoration Plan**, and if so, all the **LJRPs** or **DRZPs** containing common assets shall include a specific step that prohibits more than one of any of these **Restoration Plans** from being activated at any one point in time.

DOC9.4.6.7 The **Restoration Plan** will record which **Restoration Service Providers** and which **Restoration Service Provider's** sites are covered by the **Restoration Plan** and set out what is required from the **DNO**, **NGESO**, the relevant **Transmission Licensee** and each **Restoration Service Provider** should a **System Restoration** situation arise.

DOC9.4.6.8 Each **LJRP** shall be prepared by **NGESO** and each **DRZP** shall be prepared by the **DNO**. In both cases the **Restoration Plan** will be agreed between the **DNO**, **NGESO**, the relevant **Transmission Licensee** and relevant **Restoration Service Providers** to reflect the above discussions.

DOC9.4.6.9 Each page of the **Restoration Plan** shall bear a date of issue and the issue number.

DOC9.4.6.10 When a **Restoration Plan** has been prepared, it shall be sent to all parties involved for confirmation of its accuracy.

DOC9.4.6.11 The **Restoration Plan** shall then (if its accuracy has been confirmed) be signed on behalf of the **DNO**, **NGESO**, each relevant **Transmission Licensee** and each relevant **Restoration Service Provider** by way of written confirmation of its accuracy.

DOC9.4.6.12 Once agreed under this DOC9.4.6, the procedure will become a **Restoration Plan** under the **Grid Code** and (subject to any change pursuant to this DOC9) will apply between the **DNO**, **NGESO** the relevant **Transmission Licensee** and the relevant **Restoration Service Providers** as if it were part of the **Grid Code** and **Distribution Code**.

DOC9.4.6.12 A copy of each signed **LJRP** will be distributed by the **DNO**, **NGESO**, the relevant **Transmission Licensee** and to each restoration **Service Provider** who is a party to it accompanied by a note indicating the date of implementation.

DOC9.4.6.13 A copy of each signed **DRZP** will be distributed by the **DNO** to **NGESO**, the relevant **Transmission Licensee** and to each **Restoration Service Provider** who is a party to it accompanied by a note indicating the date of implementation.

DOC9.4.6.14 The **DNO**, **NGESO** the relevant **Transmission Licensee** and **Restoration Service Providers** must make the **Restoration Plan** readily available to the relevant operational staff.

DOC9.4.6.15 Each **Restoration Plan** will include the test criteria to be satisfied by each **Restoration Service Provider's Plant** and **Apparatus** when subject to the testing requirements of DOC5.7.3.

DOC9.4.6.16 If any party to a **Restoration Plan**, becomes aware that a change is needed to that **Restoration Plan**, it shall in the case of **LJRP** contact **NGESO** or in the case of a **DRZP**, the **DNO** to initiate a discussion between **DNO**, or **NGESO** and the relevant parties to seek to agree the relevant change. The principles applying to establishing or modifying a **Restoration Plan** under this DOC9.4.6 shall apply to such discussions and to any consequent changes.

DOC9.4.7 **Restoration Plan Testing**

DOC.9.4.7.1 The **DNO**, **NGESO**, **NGET** and the relevant **Restoration Service Providers** will conduct regular joint exercises of the **Restoration Plan(s)** to which they are parties. The objectives of such exercises include:

- To test the effectiveness of the **Restoration Plans**;
- To provide for joint training of the parties in respect of the **Restoration Plans**;
- To maintain the parties' awareness and familiarity of the **Restoration Plans**;
- To promote understanding of each parties' roles under a **Restoration Plans**;
- To identify any improvement areas which should be incorporated in to the **Restoration Plans**.

The principles applying to the establishment of a new **Restoration Plans** under DOC9.4.6 shall apply to any changes to the **Restoration Plans**.

DOC9.4.7.2 **NGESO** in coordination with the **DNO** will propose to the other parties of a **Restoration Plans** a date for the exercise to take place to be agreed with the other parties. All the **Restoration Plans** parties will jointly share the task of planning, preparing, participating in and facilitating the exercises, which will normally be in desktop format or as otherwise agreed. The precise timing of the exercise for each **Restoration Plans** will be agreed by all parties, but will not be less than one every three years.

DOC9.4.8 **Restoration Plan Provisions**

DOC9.4.8.1 The following provisions in this DOC9.4.8 apply in relation to **Restoration Plans**. Any **LJRP** and/or **DRZP** comprising common **DNO** or **Restoration Service Provider** assets cannot be activated at the same time. However this would not preclude a **LJRP** or **DRZP** from being activated at the same site(s) where there is segregation between them.

DOC9.4.8.2 For **Local Joint Restoration Plans** **NGESO** is the lead operator; for **DRZPs** the **DNO** is the lead operator.

DOC9.4.8.3 Where the lead operator, issues instructions which conflict with a **Restoration Plan** these instructions will take precedence over the requirements of the **Restoration Plan**.

- (a) When issuing such instructions, the lead operator will state whether or not it wishes the remainder of the **Restoration Plan** to apply. Where the lead operator has stated that it wishes the remainder of the **Restoration Plan** to apply the other parties to the plan may give notice that it is not possible to operate the **Restoration Plan** to the lead operator and the other parties to plan
- (b) The lead operator shall immediately consult with all parties to the **Restoration Plan**. Unless all parties reach agreement as to how the **Restoration Plan** shall operate in those circumstances, operation in accordance with the **Restoration Plan** will terminate and parties will be relieved of their obligations under the **Restoration Plan** in accordance with DOC9.4.8.6 below.
- (c) The preparation of each **DRZP** shall include a check whether any network assets cited in a **LJRP** or another **DRZP** are included in the plan, and if so, all the **LJRP** or **DRZP** containing common assets shall include a specific step that prohibits more than one of any of these plans from being activated at any one point in time

DOC9.4.8.4 The lead operator will advise other relevant parties of any requirement to switch their **User Systems** to segregate their **Demand** and to carry out such other actions as set out in the **Restoration Plan**. The relevant operator will then operate in accordance with the provisions of the **Restoration Plan**.

DOC9.4.8.5 Following notification from the **Restoration Service Provider** with the **Anchor Plant** that the **Anchor Plant** is ready to accept load, the lead operator will instruct the **Anchor Restoration Service Provider** to energise part of the **Total System**. The **Anchor Restoration Service Provider** and the other relevant parties (if any) will then, in accordance with the requirements of the **Restoration Plan**, establish communication and agree the output of their **Plant** and the connection of **Demand** so as to establish a **Power Island**. During this period, the **Anchor Restoration Service Provider** together with any **Top Up Restoration Service Providers** will be required to regulate the output of their **Restoration Service Providers' Plant** and **Apparatus** to the **Demand** prevailing in the **Power Island** in which they are situated, on the basis that they will (where practicable) seek to maintain the **Target Frequency**. **Restoration Service Providers' Plant** and **Apparatus** will (where practical) also seek to follow the requirements relating to **Reactive Power** (which may include the requirement to maintain a target voltage) set out in the **Restoration Plan**.

DOC9.4.8.6 Operation of the **Restoration Plan** shall be terminated by the lead operator either when:

- (a) the **Restoration Plan** has been successfully implemented and the resulting **Power Island** is ready to be synchronised to another **Power Island** following instruction from **NGESO**. In this case the arrangements for synchronising the **Power Island** will be set out in the **Restoration Plan**; or
- (b) the **Restoration Plan** has not been / is not being successfully implemented. In this circumstance, provided for in DOC9.4.8.3(b), if an agreement is not reached on whether or not to apply the remainder of the plan or if **NGESO** confirms to the other parties that it does not wish the remainder of the **Restoration Plan** to apply, the **Restoration Plan** shall be terminated. In this case the **DNO** and **NGESO** in conjunction with the **Restoration Service**

Providers shall agree and implement the most appropriate course of action which should aim to maintain supplies to as many customers as possible.

In both cases the lead operator shall notify all parties to the Restoration Plan accordingly.

DOC9.4.9 Local Joint Restoration Plan Operation

DOC9.4.3.5.9.1 The DNO may, in accordance with the relevant Transmission Licensee's requirements, as part of the activation of a LJRP, be required to issue instructions (although this list should not be regarded as exhaustive) to a ~~Black-Start Station~~ Anchor Power Station relating to the commencement of generation, to a ~~User or Customers~~ 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 Generating Facilities~~ 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.

DOC9.4.3.69.2 Where the DNO, as part of the Black-Start-System Restoration procedure, has given an instruction to an ~~Black-Start Station~~ Anchor Power Station to initiate startup the ~~Black-Start Station~~ Anchor Power Station shall confirm to the DNO when the startup of a Power Generating Module has been completed. Following confirmation of startup, the DNO will endeavour to stabilise that Power Generating Module by the establishment of appropriate Demand following which the DNO may instruct the ~~Black-Start Station~~ Anchor Power Station to start up the remaining available Power Generating Modules and auxiliary gas turbines if any at that ~~Black-Start Station~~ Anchor Power Station and ~~synchronise~~ Synchronise them to create a Power Island.

DOC9.4.10 DRZP Operation.

DOC9.4.10.1 In the event of System Restoration where NGESO wishes to activate one or more Distribution Restoration Zones, NGESO will issue an emergency instruction to the DNO to initiate the relevant Distribution Restoration Zone. In Scotland the instruction to a Scottish DNO to initiate a Scottish Distribution Restoration Zone would be issued by the relevant Scottish Transmission Licensee.

DOC9.4.10.2 Upon receipt of an instruction from NGESO (or the relevant Scottish Transmission Licensee) the DNO will activate the DRZP. All instructions to relevant Restoration Service Providers party to the DRZP will be issued by the DNO.

DOC9.4.10.3 These arrangements will remain in place until the Distribution Restoration Plan is terminated as provided for in that DRZP. Following Synchronisation to another Power Island, the DRZP will be terminated and instructions to relevant Restoration Service Providers will revert back to normal provisions for normal operating conditions unless otherwise informed by the DNO.

DOC9.4.10.4 Where NGESO, as part of System Restoration, has given an instruction to a DNO to activate a DRZP, the DNO will instruct the Anchor Generator to prepare to start up the relevant Power Generating Module in accordance with the DRZP.

DOC9.4.10.5 The DNO will ensure that switching carried out on the Distribution System and other actions are as set out in the DRZP.

DOC9.4.10.6 All instructions to relevant **Restoration Service Providers** forming part of the **Distribution Restoration Zone** will be issued by the **DNO**. All instructions to **Restoration Service Providers** who are party to the **CUSC** and who are active in the **DRZP** will be issued by the **DNO**.

DOC9.4.10.7 The **DNO** will issue instructions to the relevant **Restoration Service Providers** to inform them of the requirement that a **Distribution Restoration Zone** is to be energised in accordance with the **DRZP** and that they should prepare their **Plant** and **Apparatus** so that it is in a state of readiness for energizing or contributing to the **Distribution Restoration Zone**. The relevant **Restoration Service Provider(s)** will inform the **DNO** the indicative time at when their **Plant** and **Apparatus** will be in a state of readiness to energize, or to **Synchronise** to, the **System**.

DOC9.4.10.8 Automatic instructions issued by a **Distribution Restoration Zone Control System** shall be considered to be, and have the same status as, instructions from the **DNO**.

DOC9.4.10.9 At this point the **DNO** shall start to reconfigure the **DNO's Distribution System** such that it is in an appropriate state of readiness to enable the **Anchor Generator** to re-energise the intended part of the **DNO's Distribution System** in accordance with the **DRZP**. To enable this process to take place, the **DNO** may need to change the topology and status of the **DNO's Distribution System**. Reconfiguration of the **DNO's Distribution System** prior to energisation of the relevant part of the **DNO's System**, may be achieved conventionally or via fully automatic means which could include a **Distribution Restoration Zone Control System**, as required by the **DRZP**.

DOC9.4.10.10 The **DNO** shall inform **NGESO** (and relevant Scottish **Transmission Licensee** in the case of a Scottish **Distribution Restoration Zone**) when it has contacted **Anchor Generators** and other relevant **Restoration Service Providers** in accordance with the **DRZP** and provide an indicative time of when its **System** and associated **Equipment** is in a position to be re-energised and the expected time of when the **Anchor Generator** will be in a position to re-energise the intended section of the **DNO's System**.

DOC9.4.10.11 When the **DNO** has reconfigured the **DNO's Distribution System** it will contact the **Anchor Generator** to confirm and agree a time for the **Anchor Generator** to operate their **Power Generating Module(s)** so as to energise the required section of the **DNO's Distribution System**. Where subsequently the **Anchor Generator** or **DNO** needs to change the agreed energisation time as a result of an unforeseen event the **Anchor Generator** and **DNO** will agree a revised energisation time.

DOC9.4.10.12 On determining an agreed energisation time, the **DNO** will inform **NGESO** (or the relevant Scottish **Transmission Licensee**) of the time when the **Anchor Generator's Power Generating Module(s)** is scheduled to energise the intended section of the **DNO's Distribution System**. Should this scheduled time subsequently change, the **DNO** will inform **NGESO** (or the relevant Scottish **Transmission Licensee**) as necessary and provide an indication of any revised re-energisation time and the reason for the change.

DOC9.4.10.13 At the agreed re-energisation time as detailed in DOC9.4.10.12, the **DNO** will contact the **Anchor Generator** and issue an instruction for the **Anchor Generator** to energise a section of the **DNO's Distribution System** unless this is being achieved via fully automatic means which could include a **Distribution Restoration Zone Control System**.

DOC9.4.10.14 The **DNO** will then, in accordance with the requirements of the **DRZP**, agree the output of the relevant **Anchor Generator's Plant** and **Relevant Restoration Service Providers Plant** and the connection of **Demand** so as to create a **Power Island**. During this period, the **DNO** shall be required to manage the output of the relevant **Anchor Generator's Power Generating Module(s)** and/or **Relevant Restoration Service Provider's Plant** to the **Demand** prevailing in the **Power Island** in which it is situated, on the basis that it will (where practicable) seek to maintain the **Target Frequency**. Relevant **Restoration Service Providers** shall (where practical) also seek to follow the requirements relating to **Reactive Power** (which may include the requirement to maintain a target voltage) set out in the **DRZP**.

DOC9.4.10.15 Relevant **Restoration Service Providers** who are not **Anchor Generators** shall not start to **Synchronise** to the **DNO's System** until given a formal instruction by the **DNO** in accordance with DOC9.4.10.16. Such instructions would only be given once the **DNO** has achieved energization of part of its **System** by issuing instructions to **Anchor Generators**, and the **DNO's System** is in a position to expand that portion which is energized and supply more **Demand** in accordance with the **DRZP**.

DOC9.4.10.16 When the **DNO's Distribution System** has been energised and is supplying some local **Demand** and/or controllable **Demand** provided by a relevant **Restoration Service Provider**, the **Anchor Generator** will be required to follow instruction from the **DNO**, or via fully automatic means which could include a **Distribution Restoration Zone Control System**. The **DNO**, in liaison with the **Anchor Generator** will ensure the **DNO's Distribution System** is operated in a stable manner with additional **Demand** blocks being switched into service when it is appropriate to do so. As part of this process the **DNO** in coordination with the **Anchor Generator** shall ensure there is no risk to the **DNO's Distribution System** or the **Anchor Power Generating Module** through disturbances that could arise in the **Distribution Restoration Zone**. This may be achieved through a series of energisation steps or through a soft energisation between the **Anchor Generator's Power Generating Module(s)** and sections of the **DNO's Distribution System**. The requirements of this DOC9.4.10.16 may be achieved via manual instructions, remote switching carried out at the **DNO's Control Centre**, a **Distribution Restoration Zone Control System** or a combination of these options.

DOC9.4.10.17 To stabilise the voltage and **Frequency** of the **DNO's System** and increase the **Demand** fed from within the **Distribution Restoration Zone**, the **DNO** will subsequently need to instruct further relevant **Restoration Service Providers** to **Synchronise** to the **Distribution Restoration Zone**, either via manual instruction or through the use of a **Distribution Restoration Zone Control System(s)**. The control of the **Frequency** and voltage of the **Distribution Restoration Zone** will be the responsibility of the **DNO**. The control of **System Frequency** and voltage control during the whole **Restoration** phase is the responsibility of **NGESO**, although **NGESO** will require **DNOs** to manage the **Frequency** and voltage levels of **Power Islands** in the case of **Distribution Restoration Zones**.

DOC9.4.10.18 If during the **Demand** restoration process any relevant **Restoration Service Provider's Plant** cannot, because of the nature of the **Demand** being supplied, keep within its safe operating parameters, the relevant **Restoration Service Provider** shall inform the **DNO** without undue delay who in turn shall inform **NGESO**. In the case of a **Distribution Restoration Zone** in Scotland the **DNO** shall inform the relevant **Scottish Transmission Licensee**.

DOC9.4.10.19 If the circumstance of DOC9.4.10.18 arise the **DNO** will, where possible:

- i.) instruct **Demand** to be altered; or
- ii.) re-configure the **Distribution Restoration Zone**; or
- iii.) will instruct the relevant **Restoration Service Provider** forming part of the **Distribution Restoration Zone** to re-configure its **System** in order to alleviate the problem being experienced by the relevant **Restoration Service Provider's Equipment**.

NGESO and the **DNO** (and relevant **Transmission Licensee** in Scotland) accepts that any decision to keep a relevant **Restoration Service Provider's Plant** and **Apparatus** from operating, if outside its safe operating parameters, is one for the **Restoration Service Provider** concerned alone and accepts that the relevant **Restoration Service Provider's Plant** and **Apparatus** may change output if the relevant **Restoration Service Provider** believes it is necessary for safety reasons (whether relating to personnel or **Plant** and/or **Apparatus**). If such a change is made without prior notice, then the relevant **Restoration Service Provider** shall inform the **DNO** as soon as reasonably practical. The **DNO** will inform **NGESO** (and the relevant **Transmission Licensee** in the case of Scottish **Distribution Restoration Zones**) of the progress with the key stages of each **DRZP**.

DOC9.4.10.20 Once the **Distribution Restoration Zone** is operating as described in DOC9.4.10.16 and DOC9.4.10.17, the **DNO** shall undertake a step by step process of energising more elements of its **System**. The **DNO** will progressively restore auxiliary supplies to substations, supplies to **Customers** and other relevant **Restoration Service Providers** to stabilise that part of the **DNO's Distribution System** comprising the **Distribution Restoration Zone**. The **DNO** will do this by issuing instructions in the conventional way or via fully automatic means which could include a **Distribution Restoration Zone Control System**. During this phase, the **DNO** will need to ensure that each relevant **Restoration Service Provider's Equipment** is operated within its designed operational limits, that they are contributing to voltage and **Frequency** control and adequate positive and negative headroom is maintained on such **Plant** to enable the management of **Power Island** contingences. During this period, there may be a need to initiate the restoration and operation of relevant **Restoration Service Provider's Equipment** to help balance the **Distribution Restoration Zone**.

DOC9.4.10.21 As the **Demand** in the **Distribution Restoration Zone** starts to grow and become more clearly established, the **DNO** may need to update **Protection** and control settings to match the needs of the **Power Island**.

DOC9.4.10.22 With the **Distribution Restoration Zone** operating in a stable manner, the **DNO** shall ensure that that relevant **Restoration Service Providers Equipment** are operated within safe operating limits and have a sufficient headroom to be able to contribute to voltage and **Frequency** control. This is an essential pre-requisite to enable the **Power Island** to withstand volatility in **Demand** and generation, **DNO** interaction or credible faults and disturbances.

DOC9.4.10.24 Where circumstances permit, expansion of the **Power Island** within a **Distribution Restoration Zone** to a transmission busbar and to wider parts of the **Transmission System** will be managed in accordance with the **DRZP** and DOC9.5.

DOC9.4.10.25 Operation in accordance with the **DRZP** will be terminated by **NGESO** (by notifying the relevant **DNO** who will then notify the parties to the **DRZP**) co-incident with connecting the **Distribution Restoration Zone** to other **Power Islands**. Operation in accordance with the **DRZP** will also terminate in the circumstances provided for in DOC9.4.6.8(b) if an agreement is not reached or if **NGESO** states that it does not wish the remainder of the **DRZP** to apply

DOC9.4.3.711 **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**.

DOC9.4.3.812 Conclusion of System Restoration

The conclusion of ~~the Black Start~~**System Restoration** 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~~**System Restoration** situation ~~no longer exists~~**has terminated** and that normal operation of the **Total System** has begun.

DOC9.5 Re-synchronisation of De-synchronised Islands

DOC9.5.1 Resynchronization of De-synchronised islands might be required as a routine contingency, or as the conclusion of Restoration Plan.

DOC9.5.2 Routine contingency, or associated with a Restoration Plan

DOC9.5.2.1 Where parts of the **Total System** are out of ~~synchronism~~**Synchronism** with each other, ~~irrespective of whether but~~ there is ~~no a~~ **Total Shutdown** or **a Partial Shutdown**, **NGESO** will instruct **Users** to regulate generation or **Demand**, as the case may be, to enable the ~~de-synchronised~~**De-Synchronised** islands to be ~~re-synchronised~~**Re-Synchronised**.

DOC9.5.2.2 **DNOs** may be involved in ~~re-synchronising~~**Re-Synchronising** by issuing instructions to **Users** in accordance with the requirements of **NGESO**. **Users** shall at all times abide by the **DNO's** instructions in relation to ~~re-synchronising~~**Re-Synchronising** ~~de-synchronised~~**De-Synchronised** islands.

DOC9.5.2.3 The ~~re-synchronising~~**Re-Synchronising** of ~~de-synchronised~~**De-Synchronised** islands are covered by De-synchronised Island Procedures agreed between **NGESO** and the relevant **Transmission Licensee**, **DNO** and **Generators**.

DOC9.5.3 Islanding Loading and Generation Management

DOC9.5.3.1 Generation in De-synchronised Power Islands may be dealt with in different ways as follows:

DOC9.5.3.2 The general approach and approach for LJRP**(a) Data exchanged between DNOs and Generators via NGESO**

(i) In this section DOC9.5.3.2.(a), relevant loading and other operational parameters are exchanged indirectly between Generators who are BM Participants and the DNO via NGESO.

(ii) NGESO, each Generator with Synchronised (or connected and available to generate although not Synchronised) Power Generating Modules in the De-Synchronised Island and the DNO shall exchange information as set out in this DOC9.5.3.2.(a) to enable NGESO to issue instructions via the Balancing Mechanism or via an emergency instruction to that Generator in relation to its Power Generating Modules in the De-Synchronised Power Island until Re-Synchronisation takes place, on the basis that the Generator will (where practicable) seek to maintain the

Target Frequency.

(iii) The information to **NGESO** from the **Generator** will cover its relevant operational parameters as required in the Balancing Code in the **Grid Code** and from **NGESO** to the **Generator** will cover data on **Demand** and changes in **Demand** in the **De-Synchronised Power Island**.

(iv) The information from the **DNO** to **NGESO** will comprise data on **Demand** in the **De-Synchronised Island**, including data on any constraints within the **De-Synchronised Power Island**.

(v) **NGESO** will keep the **DNO** informed of the balancing instructions or **Emergency Instructions** it is issuing to **Embedded Power Generating Modules** within the **De-Synchronised Power Island**.

(b) Data exchanged directly between **DNOs and **Generators****

(i) In this section DOC9.5.3.2(b) relevant loading and other operational parameters are exchanged directly between **Generators** who are **BM Participants** and the **DNO**.

- (ii) NGESO will issue an emergency instruction and/or a instructions via the **Balancing Mechanism**, to the **Generator** to "float" local **Demand** and maintain **Frequency** at **Target Frequency**. Under this instruction, the **Generator** will be required to regulate the output of its **Power Generating Module(s)** at the **Power Station** in question to the **Demand** prevailing in the **De-Synchronised Power Island** in which it is situated, until **Re-Synchronisation** takes place, on the basis that it will (where practicable) seek to maintain the **Target Frequency**.
- (iii) The **DNO** is required to be in contact with the **Generator** at the **Power Station** so that the **DNO** can supply data to the **Generator** on **Demand** changes within the **De-Synchronised Power Island**.
- (iv) If more than one **Power Generating Module** is **Synchronised** on the **De-Synchronised Power Island**, or is connected to the **De-Synchronised Power Island** and available to generate although not **Synchronised**, the **DNO** will need to liaise with **NGESO** to agree which **Power Generating Module(s)** will be utilised to accommodate changes in **Demand** in the **De-Synchronised Power Island**. The **DNO** will then maintain contact with the relevant **Generator** (or **Generators**) in relation to that **Power Generating Module(s)**.
- (v) The **Generator** at the **Power Station** must contact the **DNO** if the level of **Demand** which it has been asked to meet as a result of the emergency instruction and/or instruction in the **Balancing Mechanism** to "float" and the detail on **Demand** passed on by the **DNO**, is likely to cause problems for safety reasons (whether relating to personnel or **Plant** and/or **Apparatus**) in the operation of its **Power Generating Modules(s)**, in order that the **DNO** can alter the level of **Demand** which that **Generator** needs to arrange to meet. Any decision to operate outside any relevant parameters is one entirely for the **Generator**.

DOC9.5.3.3 Distribution Restoration Zone data management

- (a) Once a **Distribution Restoration Zone** has been activated the **DNO** will issue instructions to the **Anchor Generator** to "float" local **Demand** and maintain **Frequency** at the **Target Frequency**. Relevant **Restoration Service Providers** shall regulate the output of their **Plant** to the **Demand** prevailing in the **De-synchronised Power Island** in which it is situated, on the basis that it will (where practicable) seek to maintain the **Target Frequency** until **Re-synchronisation** takes place.
- (b) The **DNO** shall be in contact with the **Restoration Service Providers** to supply data on **Demand** changes within the **de-Synchronised Power Island**.
- (c) If there is more than one **Restoration Service Provider** in the **De-synchronised Power Island**, or connected to the **De-synchronised Power Island** and available to operate although not **Synchronised**, the **DNO** will need to liaise with **NGESO** to agree which **Restoration Service Providers** will be used to accommodate changes in **Demand** in the **De-synchronised Power Island**. The **DNO** shall maintain contact with the relevant **Restoration Service Providers** and instruct them accordingly.

- (d) The **Anchor Generator** must contact the **DNO** if the level of **Demand** which it has been asked to meet as a result of the instruction to "float", is likely to cause problems for safety reasons (whether relating to personnel or **Plant** and/or **Apparatus**) in the operation of its **Anchor Power Generating Module**, in order that the **DNO** can alter the level of **Demand** which that **Anchor Power Generating Module** needs to meet. Any decision to operate outside any relevant parameters is one entirely for the **Anchor Generator**.

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 **NGESO** 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** for **Power Generating Modules** compliant with EREC G59, and in accordance with EREC G99 for **Power Generating Modules** compliant with EREC G99.

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** for **Power Generating Modules** compliant with EREC G59, and in accordance with EREC G99 for **Power Generating Modules** compliant with EREC G99.

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 Power Generating Module** Technical Information.
- DDRC6.3 Schedule 5e - **Embedded Transmission System**
- DDRC6.4 Schedule 5f –Restoration Service Providers’s Information for Distribution Restoration Zones
- DDRC6.54 Schedule 6 - **Demand** forecasts - as described in DOC1, time varying output/generation forecasts for the **Users** defined in the scope.
- DDRC6.56 Schedule 7 - **Operational Planning** - as described in **DOC2**, outage planning information.
- DDRC6.67 Schedule 8 - **System** Design Information - comprising **System** technical data.
- DDRC6.78 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.
- DDRC6.89 The schedules applicable to each class of **User** are as follows:-

Schedule Number:-	Title	Applicable to:-
Schedule 5a	Power Station Data	Every Power Station
Schedule 5b	Power Generating Module Data	All Embedded Power Generating Modules
Schedule 5c	Power Generating Module Data	For specified types of Power Generating Module and ancillary Plant and Apparatus (i) Synchronous Power Generating Module (ii) Fixed speed induction Power Generating Module (iii) Doubly fed induction Power Generating Module (iv) Series Converter Connected Power Generating Module (v) Transformers
Schedule 5d	DNO Network Data	DNO’s Distribution System
Schedule 5e	All Embedded Transmission System	All Embedded Transmission System

Schedule Number:-	Title	Applicable to:-
<u>Schedule 5f</u>	<u>Re-synchronization times and Block Loading Capabilities</u>	<u>All Restoration Service Providers for Distribution Restoration Zones</u>
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 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

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Schedule 5e**DATA REGISTRATION CODE****DATA FOR EMBEDDED TRANSMISSION SYSTEMS**

<u>DATA DESCRIPTION</u>	<u>UNITS</u>	<u>DATA CATEGORY</u>
5e Embedded Transmission System Data		
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 Station and/or Power Generating Modules connected to the Embedded Transmission System	Number	SPD
Operating regime of Power Station and/or Power Generating Modules – 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)		

<u>DATA DESCRIPTION</u>	<u>UNITS</u>	<u>DATA CATEGORY</u>
5e Embedded Transmission System Data		
Registered Capacity (maximum Active Power export)	MW	SPD
Maximum Reactive Power export (lagging)	MVAr	SPD
Maximum Reactive Power import (leading)	MVAr	SPD
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 3 ϕ short circuit fault at the Connection Point	kA	SPD
RMS value of the initial symmetrical short circuit current (I_k'') for a 3 ϕ short circuit fault at the Connection Point	kA	SPD
RMS value of the symmetrical short circuit current at 100ms ($I_{k(100)}$) for a 3 ϕ 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 <u>Synchronising</u> 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:

- Intermittent and Non-intermittent Generation is defined in ENA EREP 130 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, DOC5, DOC7.4, DOC8.6.3, DOC8.6.4, DOC9 and DOC10 and the requirements of EREC G59 and EREC G99 as applicable. 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 5f**DATA REGISTRATION CODE****RE SYNCHRONIZATION TIMES AND BLOCK LOADING CAPABILITIES FROM RESTORATION SERVICE PROVIDERS FOR DISTRIBUTION RESTORATION ZONES**

DATA DESCRIPTION	UNITS	DATA CATEGORY
5f Restoration Service Provider Data		
RE-SYNCHRONIZATION TIMES		
Assuming all Restoration Service Providers' Plant and Apparatus were running immediately prior to the Total Shutdown or Partial Shutdown and in the event of loss of all external power supplies, provide the following information:		
The estimated time by when each item of relevant Plant identified in the DRZP can be Synchronised after receiving an instruction following a Total Shutdown or Partial Shutdown . (see note 1)	Tabular or graphical	DPD
Describe any significant issues (ie those that would affect the time at which the Anchor Power Generating Module or Restoration Service Provider's Plant to be Synchronised) that may arise, as time progresses without external supplies being restored.	Text	DPD
BLOCK LOADING CAPABILITIES		
The estimated Block Loading Capability of the relevant Plant shall be provided in either graphical or tabular format showing the estimated block loading capability from 0MW to the Plant's Registered Capacity . Any particular Active Power loading points at which the Anchor Generator's Plant or Restoration Service Provider's Plant should be operated until further changes in output can be accommodated, and the time between those changes, should also be identified. (See note 2)	Tabular or graphical	DPD

Note 1 The estimate should include the **Anchor Generator's** or the **Restoration Service Provider's** ability to **Re-Synchronise** all their **Plant**, assuming all were running immediately prior to the **Total Shutdown or Partial Shutdown**

Note 2 The data of each **Anchor Power Generating Module** and **Restoration Service Provider's Plant** forming part of a **Distribution Restoration Zone** should be provided for the condition of an **Anchor Power Generating Module or Restoration Service Provider's Plant** (which are considered as both 'hot' units (running prior to **Shutdown**) and cold units (not run for 48 hours or more prior to the shutdown) that were **Synchronised** immediately prior to the **Total Shutdown or Partial Shutdown**. The **Block Loading Capability** assessment should be done against a frequency variation of 49.5Hz – 50.5Hz, assuming an initial **Frequency** of 50.0Hz.

END