Public

All Recipients of the Serviced Grid Code

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**08 April 2025**

**THE SERVICED GRID CODE – ISSUE 6 REVISION 31**

**INCLUSION OF REVISED SECTION**

- Glossary & Definitions
- Planning Code
- Operating Code 9
- General Conditions

**SUMMARY OF CHANGES**

These changes arise from the implementation of:

**GC0159: Introducing Competitively Appointed Transmission Owners**

and from revised Electrical standards documents as follows:

- Electronic Data Transfer (EDT) Interface Specification
- Communications Standards
- EDL Message Interface Specification
- Control Telephony Standard

Many thanks,

Code Administrator

National Energy System Operator

# THE GRID CODE

## ISSUE 6

### REVISION 31

**08 April 2025**

# GLOSSARY & DEFINITIONS

**(GD)**

GD.1 In the Grid Code the following words and expressions shall, unless the subject matter or context otherwise requires or is inconsistent therewith, bear the following meanings:

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| **Access** | A group of **Connection Points** within which a **User** declares under the **Planning Code**<br>(a) An interconnection and/or<br>(b) A need to redistribute **Demand** between those **Connection Points** either pre-fault or post-fault<br>Where a single **Connection Point** does not form part of an **Access Group** in accordance with the above, that single **Connection Point** shall be considered to be an **Access Group** in its own right. |
| **Access Period** | A period of time in respect of which each **Transmission Interface Circuit** is to be assessed as whether or not it is capable of being maintained as derived in accordance with PC.A.4.1.4. The period shall commence and end on specified calendar weeks. |
| **Act** | The Electricity Act 1989. |

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| **Active Control Based Droop Power** | **The Active Control Based Power** output supplied by a **Grid Forming Plant** through controlled means (be it manual or automatic).<br><br>For **GBGF-I** this is equivalent to a **Synchronous Generating Unit** with a traditional governor coupled to its prime mover.<br><br>**Active Control Based Droop Power** is used by **The Company** to control **System Frequency** changes through the instruction of **Primary Response** and **Secondary Response**. |

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| **Active Control Based Power** | The **Active Power** output supplied by a **Grid Forming Plant** through controlled means (be it manual or automatic) of the positive phase sequence Root Mean Square **Active Power** produced at fundamental **System Frequency** by the control system of a **Grid Forming Unit**.<br><br>For **GBGF-I**, this is equivalent to a **Synchronous Generating Unit** with a traditional governor coupled to its prime mover.<br><br>**Active Control Based Power** includes **Active Power** changes that results from a change to the **Grid Forming Plant Owners** available set points that have a 5 Hz limit on the bandwidth of the provided response.<br><br>**Active Control Based Power** also includes **Active Power** components produced by the normal operation of a **Grid Forming Plant** that comply with the **Engineering Recommendation** P28 limits. These **Active Power** components do not have a 5 Hz limit on the bandwidth of the provided response.<br><br>**Active Control Based Power** does not include **Active Power** components proportional to **System Frequency**, slip or deviation that provide damping power to emulate the natural damping function provided by a real **Synchronous Generating Unit**. |
| **Active Damping Power** | The **Active Power** naturally injected or absorbed by a **Grid Forming Plant** to reduce **Active Power** oscillations in the **Total System**.<br><br>More specifically, **Active Damping Power** is the damped response of a **Grid Forming Plant** to an oscillation between the voltage at the **Grid Entry Point** or **User System Entry Point** and the voltage of the **Internal Voltage Source** of the **Grid Forming Plant**.<br><br>For the avoidance of doubt, **Active Damping Power** is an inherent capability of a **Grid Forming Plant** that starts to respond naturally, within less than 5ms to low frequency oscillations in the **System Frequency**. |
| **Active Energy** | The electrical energy produced, flowing or supplied by an electric circuit during a time interval, being the integral with respect to time of the instantaneous power, measured in units of watt-hours or standard multiples thereof, ie:<br><br>1000 Wh = 1 kWh<br><br>1000 kWh = 1 MWh<br><br>1000 MWh = 1 GWh<br><br>1000 GWh = 1 TWh |

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| **Active Frequency Response Power** | The injection or absorption of **Active Power** by a **Grid Forming Plant** to or from the **Total System** during a deviation of the **System Frequency** away from the **Target Frequency**.<br><br>For a **GBGF-I** this is very similar to **Primary Response** but with a response time to achieve the declared service capability (which could be the **Maximum Capacity** or **Registered Capacity**) within 1 second.<br><br>For **GBGF-I** this can rapidly inject or absorb **Active Power** in addition to the phase-based **Active Inertia Power** to provide a system with desirable **NFP** plot characteristics.<br><br>**Active Frequency Response Power** can be produced by any viable control technology. |
| **Active Inertia Power** | The injection or absorption of **Active Power** by a **Grid Forming Plant** to or from the **Total System** during a **System Frequency** change.<br><br>The transient injection or absorption of **Active Power** from a **Grid Forming Plant** to the **Total System** as a result of the **ROCOF** value at the **Grid Entry Point** or **User System Entry Point**. This requires a sufficient energy storage capacity of the **Grid Forming Plant** to meet the **Grid Forming Capability** requirements specified in ECC.6.3.19.<br><br>For the avoidance of doubt, this includes the rotational inertial energy of the complete drive train of a **Synchronous Generating Unit**.<br><br>**Active Inertia Power** is an inherent capability of a **Grid Forming Plant** to respond naturally, within less than 5ms, to changes in the **System Frequency**.<br><br>For the avoidance of doubt, the **Active Inertia Power** has a slower frequency response compared with **Active Phase Jump Power**. |
| **Active Phase Jump Power** | The transient injection or absorption of **Active Power** from a **Grid Forming Plant** to the **Total System** as a result of changes in the phase angle between the **Internal Voltage Source** of the **Grid Forming Plant** and the **Grid Entry Point** or **User System Entry Point**.<br><br>In the event of a disturbance or fault on the **Total System**, a **Grid Forming Plant** will instantaneously (within 5ms) inject or absorb **Active Phase Jump Power** to the **Total System** as a result of the phase angle change.<br><br>For **GBGF-I** as a minimum value this is up to the **Phase Jump Angle Limit Power**.<br><br>**Active Phase Jump Power** is an inherent capability of a **Grid Forming Plant** that starts to respond naturally, within less than 5 ms and can have frequency components of over 1000 Hz. |
| **Active Power** | The product of voltage and the in-phase component of alternating current measured in units of watts and standard multiples thereof, ie:<br><br>1000 Watts = 1 kW<br><br>1000 kW = 1 MW<br><br>1000 MW = 1 GW<br><br>1000 GW = 1 TW |

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| **Active ROCOF Response Power** | The **Active Inertia Power** developed from a **Grid Forming Plant** plus the **Active Frequency Response Power** that can be supplied by a **Grid Forming Plant** when subject to a rate of change of the **System Frequency**. |
| **Additional BM Unit** | Has the meaning as set out in the **BSC** |
| **Affiliate** | In relation to any person, any holding company or subsidiary of such person or any subsidiary of a holding company of such person, in each case within the meaning of Section 736, 736A and 736B of the Companies Act 1985 as substituted by section 144 of the Companies Act 1989 and, if that latter section is not in force at the **Transfer Date**, as if such section were in force at such date. |
| **AF Rules** | Has the meaning given to "allocation framework" in section 13(2) of the Energy Act 2013. |
| **Agency** | As defined in the **ESO Licence.** |
| **Aggregator** | A **BM Participant** who controls one or more **Additional BM Units** or **Secondary BM Units**. |
| **Aggregator Impact Matrix** | Defined for an **Additional BM Unit** or a **Secondary BM Unit**. Provides data allowing **The Company** to model the result of a **Bid-Offer Acceptance** on each of the **Grid Supply Points** within the **GSP Group** over which the **Additional BM Unit** or **Secondary BM Unit** is defined. |
| **Alternate Member** | Shall mean an alternate member for the **Panel Members** elected or appointed in accordance with this GR.7.2(a) or (b). |
| **Anchor** | **Plant**, owned and operated by a **Restoration Contractor** which can **Start-Up** from **Shutdown** and energise a part of the **Total System** upon instruction from **The Company** or a **Network Operator** or a relevant **Transmission Licensee** within a defined time period, without an external electrical power supply from the **Total System**. |
| **Anchor DC Converter Test** | A test carried out by an **Anchor DC Converter Owner** on an **Anchor DC Converter** while the **Anchor DC Converter** is disconnected from all external electrical power supplies from the **Total System**. |
| **Anchor Generating Unit Test** | A test carried out on an **Anchor Generating Unit** or a **CCGT** unit or a **Power Generating Module**, as the case may be, at an **Anchor Power Station** while the **Anchor Power Station** remains energised from the **Total System**. |
| **Anchor HVDC System Test** | A test carried out by an **Anchor HVDC System Owner** while the **Anchor HVDC System** is disconnected from all external electrical power supplies from the **Total System**. |

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| **Anchor Plant Capability** | The ability of a **Restoration Contractor's Plant** to **Start-Up** from **Shutdown** and to energise and maintain a part of the **Total System** upon instruction from **The Company** or **Relevant Transmission Licensee** (in Scotland) or relevant **Network Operator**, within a defined time period, without an external electrical power supply from the **Total System**. In the case of a **Local Joint Restoration Plan** the defined period of time is within 2 hours of an instruction from **The Company** or **Relevant Transmission Licensee**. In the case of a **Distribution Restoration Zone Plan**, the defined period of time is within 8 hours of an instruction from relevant **Network Operator**. |
| **Anchor Plant Test** | A test conducted on **Plant** to confirm it is capable of meeting the requirements of an **Anchor Restoration Contract**. |
| **Anchor Power Station Test** | A test carried out by an **Anchor Generator** at an **Anchor Power Station** while that **Anchor Power Station** is disconnected from all external electrical power supplies from the **Total System**. |
| **Anchor Restoration Contract** | In the case of a **Local Joint Restoration Plan** or **Offshore Local Joint Restoration Plan**, a contract between **The Company** and an **Anchor Restoration Contractor** for the provision of an **Anchor Plant Capability**. In the case of a **Distribution Restoration Zone Plan** is an agreement between **The Company** and relevant **Network Operator** and **Anchor Restoration Contractor** for the provision of an **Anchor Plant Capability**. |
| **Anchor Restoration Contractor** | A **Restoration Contractor** with an **Anchor Restoration Contract**. |
| **Anchor Plant Unit Test** | A test carried out on a **Generating Unit** or a **CCGT Unit** or a **Power Generating Module**, or a **HVDC System** or a **DC Converter** as the case may be, at the site of an **Anchor Plant** while the **Anchor Plant** is supplied from all external power supplies. |
| **Ancillary Service** | A **System Ancillary Service** and/or a **Commercial Ancillary Service**, as the case may be. An **Ancillary Service** may include one or more **Demand Response Services**. |
| **Ancillary Services Agreement** | An agreement between a **User** and **The Company** for the payment by **The Company** to that **User** in respect of the provision by such **User** of **Ancillary Services**. |
| **Annual Average Cold Spell Conditions** or **ACS Conditions** | A particular combination of weather elements which gives 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** | Other than in **OC8**, means all equipment in which electrical conductors are used, supported or of which they may form a part. It includes **Users'** equipment which imposes **Demand** on the **System**.<br><br>In **OC8**, it means **High Voltage** electrical circuits forming part of a **System** on which **Safety Precautions** may be applied to allow work and/or testing to be carried out on a **System**. |

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| **Apparent Power** | The product of voltage and of alternating current measured in units of voltamperes and standard multiples thereof, ie:<br>1000 VA = 1 kVA<br>1000 kVA = 1 MVA |
| **Approved Fast Track Proposal** | Has the meaning given in GR.26.7, provided that no objection is received pursuant to GR.26.12. |
| **Approved Grid Code Self-Governance Proposal** | Has the meaning given in GR.24.10. |
| **Approved Modification** | Has the meaning given in GR.22.7 |
| **Assimilated Law** | Has the same meaning as that given by section 6(7) of the European Union (Withdrawal) Act 2018 |
| **Authorised Certifier** | An entity that issues **Equipment Certificates** and **Power Generating Module Documents** and whose accreditation is given by the United Kingdom Accreditation Service or such other body as may be established from time to time to carry out the function of accreditation. |
| **Authorised Electricity Operator** | Any person (other than **The Company**) who is authorised under the **Act** to generate, participate in the transmission of, distribute or supply electricity which shall include any **Interconnector Owner** or **Interconnector User**. |
| **Authority-Led Modification** | A **Grid Code Modification Proposal** in respect of a **Significant Code Review**, raised by the Authority pursuant to GR.17 |
| **Authority-Led Modification Report** | Has the meaning given in GR.17.4. |
| **Authority for Access** | An authority which grants the holder the right to unaccompanied access to sites containing exposed **HV** conductors. |
| **Authority**, The | The **Authority** established by section 1 (1) of the Utilities Act 2000. |
| **Automatic Voltage Regulator** or **AVR** | The continuously acting automatic equipment controlling the terminal voltage of a **Synchronous Generating Unit** or **Synchronous Power Generating Module** by comparing the actual terminal voltage with a reference value and controlling by appropriate means the output of an **Exciter**, depending on the deviations. |
| **Auxiliaries** | Any item of **Plant** and/or **Apparatus** not directly a part of the boiler plant or **Power Generating Module** or **Generating Unit** or **DC Converter** or **HVDC Equipment** or **Power Park Module**, but required for the boiler plant's or **Power Generating Module's** or **Generating Unit's** or **DC Converter's** or **HVDC Equipment's** or **Power Park Module's** functional operation. |
| **Auxiliary Diesel Engine** | A diesel engine driving a **Power Generating Module** or **Generating Unit** which can supply a **Unit Board** or **Station Board**, which can start without an electrical power supply from outside the **Power Station** within which it is situated. |

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| **Auxiliary Energy Supplies** | An electricity supply (which could be derived from an **Auxiliary Diesel Engine** or **Auxiliary Gas Turbine** or other source of energy) that is necessary to power the auxiliary and ancillary equipment on which a **Power Generating Module** or **HVDC System** or **DC Converter** or other item of **Plant** relies for it to be capable of generating **Active** or **Reactive Power** and which is generally supplied via a **Unit Board** or **Station Board**, or equivalent. **Auxiliary Energy Supplies** must be available without an external electrical power supply from the **Total System**. **Auxiliary Energy Supplies** do not include the mains-independent light current supplies necessary to operate **Critical Tools and Facilities**. |
| **Auxiliary Gas Turbine** | A **Gas Turbine Unit**, which can supply a **Unit Board** or **Station Board**, which can start without an electrical power supply from outside the **Power Station** within which it is situated. |
| **Average Conditions** | That combination of weather elements within a period of time which is the average of the observed values of those weather elements during equivalent periods over many years (sometimes referred to as normal weather). |
| **Back-Up Protection** | A **Protection** system which will operate when a system fault is not cleared by other **Protection**. |
| **Balancing and Settlement Code** or **BSC** | The code of that title as from time to time amended. |
| **Balancing Code** or **BC** | That portion of the Grid Code which specifies the **Balancing Mechanism** process. |
| **Balancing Mechanism** | Has the meaning set out in the **ESO Licence.** |
| **Balancing Mechanism Reporting Agent** or **BMRA** | Has the meaning set out in the **BSC**. |
| **Balancing Mechanism Reporting Service** or **BMRS** | Has the meaning set out in the **BSC**. |
| **Balancing Principles Statement** | A statement prepared by **The Company** in accordance with condition C9 of the **ESO Licence**. |
| **Baseline Forecast** | Has the meaning given to the term ‘baseline forecast’ in Section G of the **BSC**. |
| **Bid-Offer Acceptance** | (a) A communication issued by **The Company** in accordance with BC2.7; or<br>(b) an **Emergency Instruction** to the extent provided for in BC2.9.2.3. |
| **Bid-Offer Data** | Has the meaning set out in the **BSC**. |
| **Bilateral Agreement** | Has the meaning set out in the **CUSC**. |
| **Bilateral Embedded Generation Agreement (BEGA)** | Has the meaning set out in the **CUSC**. |

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| **Block Loading Capability** | The **Active Power** step and the time between steps (from no load to **Rated MW**),which a **Generating Unit** or **Power Generating Module** or **Power Park Module** or **HVDC System** or **DC Converter Station** (including **Plant** and **Apparatus** owned and operated by a **Restoration Contractor**) can instantaneously supply without causing it to trip or go outside the **Frequency** range of 47.5Hz – 52Hz assuming the **Plant** is initially operating at a nominal **System Frequency** of 50Hz (or an otherwise agreed **Frequency** range). |
| **BM Participant** | A person who is responsible for and controls one or more **BM Units** or where a **Bilateral Agreement** specifies that a **User** is required to be treated as a **BM Participant** for the purposes of the Grid Code. For the avoidance of doubt, it does not imply that they must be active in the **Balancing Mechanism**. |
| **BM Unit** | Has the meaning set out in the **BSC**, except that for the purposes of the Grid Code the reference to "Party" in the **BSC** shall be a reference to **User**. |
| **BM Unit Data** | The collection of parameters associated with each **BM Unit**, as described in Appendix 1 of **BC1**. |
| **Boiler Time Constant** | Determined at **Registered Capacity** or **Maximum Capacity** (as applicable), the boiler time constant will be construed in accordance with the principles of the IEEE Committee Report "Dynamic Models for Steam and Hydro Turbines in Power System Studies" published in 1973 which apply to such phrase. |
| **British Standards** or **BS** | Those standards and specifications approved by the British Standards Institution. |
| **BSCCo** | Has the meaning set out in the **BSC**. |
| **BSC Panel** | Has meaning set out for "Panel" in the **BSC**. |
| **Business Day** | Any week day (other than a Saturday) on which banks are open for domestic business in the City of London. |
| **Cancellation of National Electricity Transmission System Warning** | The notification given to **Users** when a **National Electricity Transmission System Warning** is cancelled. |
| **Capacity Market Documents** | The **Capacity Market Rules**, The **Electricity Capacity Regulations** 2014 and any other Regulations made under Chapter 3 of Part 2 of the Energy Act 2013 which are in force from time to time. |
| **Capacity Market Rules** | The rules made under section 34 of the Energy Act 2013 as modified from time to time in accordance with that section and The Electricity Capacity Regulations 2014. |

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| **Cascade Hydro Scheme** | Two or more hydro-electric **Generating Units**, owned or controlled by the same **Generator**, which are located in the same water catchment area and are at different ordnance datums and which depend upon a common source of water for their operation, known as:<br>(a) Moriston<br>(b) Killin<br>I Garry<br>(d) Conon<br>(e) Clunie<br>(f) Beauly<br>which will comprise more than one **Power Station**. |
| **Cascade Hydro Scheme Matrix** | The matrix described in Appendix 1 to **BC1** under the heading **Cascade Hydro Scheme Matrix**. |
| **Category 1 Intertripping Scheme** | A **System to Generator Operational Intertripping Scheme** arising from a Variation to Connection Design following a request from the relevant **User** which is consistent with the criteria specified in the **Security and Quality of Supply Standard**. |
| **Category 2 Intertripping Scheme** | A System to Generator Operational Intertripping Scheme which is:-<br>(i) required to alleviate an overload on a circuit which connects the **Group** containing the **User's Connection Site** to the **National Electricity Transmission System**; and<br>(ii) installed in accordance with the requirements of the planning criteria of the **Security and Quality of Supply Standard** in order that measures can be taken to permit maintenance access for each transmission circuit and for such measures to be economically justified,<br>and the operation of which results in a reduction in **Active Power** on the overloaded circuits which connect the **User's Connection Site** to the rest of the **National Electricity Transmission System** which is equal to the reduction in **Active Power** from the **Connection Site** (once any system losses or third party system effects are discounted). |
| **Category 3 Intertripping Scheme** | A **System to Generator Operational Intertripping Scheme** which, where agreed by **The Company** and the **User**, is installed to alleviate an overload on, and as an alternative to, the reinforcement of a third party system, such as the **Distribution System** of a **Public Distribution System Operator**. |
| **Category 4 Intertripping Scheme** | A **System to Generator Operational Intertripping Scheme** installed to enable the disconnection of the **Connection Site** from the **National Electricity Transmission System** in a controlled and efficient manner in order to facilitate the timely restoration of the **National Electricity Transmission System**. |
| **Caution Notice** | A notice conveying a warning against interference. |
| **CENELEC** | European Committee for Electrotechnical Standardisation. |

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| **Citizens Advice** | Means the National Association of Citizens Advice Bureaux. |
| **Citizens Advice Scotland** | Means the Scottish Association of Citizens Advice Bureaux. |
| **CfD Counterparty** | A person designated as a "CfD counterparty" under section 7(1) of the Energy Act 2013. |
| **CfD Documents** | The **AF Rules**, The Contracts for Difference (Allocation) Regulations 2014, The Contracts for Difference (Definition of Eligible Generator) Regulations 2014 and The Contracts for Difference (Electricity Supplier Obligations) Regulations 2014 and any other regulations made under Chapter 2 of Part 2 of the Energy Act 2013 which are in force from time to time. |
| **CfD Settlement Services Provider** | means any person:<br>(i) appointed for the time being and from time to time by a **CfD Counterparty**; or<br>(ii) who is designated by virtue of Section C1.2.1B of the Balancing and Settlement Code,<br>in either case to carry out any of the CFD settlement activities (or any successor entity performing CFD settlement activities). |
| **CCGT Module Matrix** | The matrix described in Appendix 1 to BC1 under the heading **CCGT Module Matrix**. |
| **CCGT Module Planning Matrix** | A matrix in the form set out in Appendix 3 of OC2 showing the combination of **CCGT Units** within a **CCGT Module** which would be running in relation to any given MW output. |
| **Closed Distribution System** or **CDSO** | A distribution system classified as a **Closed Distribution System** by the **Authority** which distributes electricity within a geographically confined industrial, commercial or shared services site and does not supply household **Customers**, without prejudice to incidental use by a small number of households located within the area served by the **System** and with employment or similar associations with the owner of the **System**. |
| **CM Administrative Parties** | The **Secretary of State**, the **CM Settlement Body**, and any **CM Settlement Services Provider**. |
| **CM Settlement Body** | the Electricity Settlements Company Ltd or such other person as may from time to time be appointed as Settlement Body under regulation 80 of the Electricity Capacity Regulations 2014. |
| **CM Settlement Services Provider** | any person with whom the **CM Settlement Body** has entered into a contract to provide services to it in relation to the performance of its functions under the **Capacity Market Documents**. |

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| **Code Administration Code of Practice** | Means the code of practice approved by the **Authority** and:<br>(a) developed and maintained by the code administrators in existence from time to time; and<br>(b) amended subject to the **Authority's** approval from time to time; and<br>(c) re-published from time to time; |
| **Code Administrator** | Means **The Company** carrying out the role of **Code Administrator** in accordance with the General Conditions. |
| **Combined Cycle Gas Turbine Module** or **CCGT Module** | A collection of **Generating Units** (registered as a **CCGT Module** (which could be within a **Power Generating Module**) under the **PC**) comprising one or more **Gas Turbine Units** (or other gas based engine units) and one or more **Steam Units** where, in normal operation, the waste heat from the **Gas Turbines** is passed to the water/steam system of the associated **Steam Unit** or **Steam Units** and where the component units within the **CCGT Module** are directly connected by steam or hot gas lines which enable those units to contribute to the efficiency of the combined cycle operation of the **CCGT Module**. |
| **Combined Cycle Gas Turbine Unit** or **CCGT Unit** | A **Generating Unit** within a **CCGT Module**. |
| **Commercial Ancillary Services** | **Ancillary Services**, other than **System Ancillary Services**, utilised by **The Company** in operating the **Total System** if a **User** (or other person such as a **Demand Response Provider**) has agreed to provide them under an **Ancillary Services Agreement** or under a **Bilateral Agreement** with payment being dealt with under an **Ancillary Services Agreement** or in the case of **Externally Interconnected System Operators** or **Interconnector Users**, under any other agreement (and in the case of **Externally Interconnected System Operators** and **Interconnector Users** includes **Ancillary Services** equivalent to or similar to **System Ancillary Services**). |
| **Commercial Boundary** | Has the meaning set out in the **CUSC** |
| **Committed Level** | The expected **Active Power** output from a **BM Unit** after accepting a **Bid-Offer Acceptance** or **RR Instruction** or a combination of **Bid-Offer Acceptances** and **RR Instructions**. |
| **Committed Project Planning Data** | Data relating to a **User Development** once the offer for a **CUSC Contract** is accepted. |
| **Common Collection Busbar** | A busbar within a **Power Park Module** to which the higher voltage side of two or more **Power Park Unit** generator transformers are connected. |
| **Competitively Appointed Transmission Licensee** | A person granted a **Transmission Licence** (as defined in Section 6(1)b of the Act) to own and operate an **Onshore Transmission System** on the basis of competitive tendering undertaken pursuant to Section 6C of the Electricity Act 1989. |
| **Competitively Appointed Transmission Licensee Interface Point** | The electrical point of connection between a **Transmission System** owned by a **Competitively Appointed Transmission Licensee** and the assets of another **Transmission Licensee**. |

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| **Completion Date** | Has the meaning set out in the **Bilateral Agreement** with each **User** to that term or in the absence of that term to such other term reflecting the date when a **User** is expected to connect to or start using the **National Electricity Transmission System**. In the case of an **Embedded Medium Power Station** or **Embedded DC Converter Station** or **Embedded HVDC System** having a similar meaning in relation to the **Network Operator's System** as set out in the **Embedded Development Agreement**. |
| **Complex** | A **Connection Site** together with the associated **Power Station** and/or **Network Operator** substation and/or associated **Plant** and/or **Apparatus**, as appropriate. |
| **Compliance Processes** or **CP** | That portion of the Grid Code which is identified as the **Compliance Processes**. |
| **Compliance Statement** | A statement completed by the relevant **User** confirming compliance with each of the relevant Grid Code provisions, and the supporting evidence in respect of such compliance, of its:<br><br>**Generating Unit(s)**; or,<br><br>**Power Generating Modules** (including **DC Connected Power Park Modules** and/or **Electricity Storage Modules**); or,<br><br>**CCGT Module(s)**; or,<br><br>**Power Park Module(s)**; or,<br><br>**DC Converter(s)**; or<br><br>**HVDC Systems**; or<br><br>**Plant** and **Apparatus** at an **EU Grid Supply Point** owned or operated by a **Network Operator**; or<br><br>**Network Operator's** entire distribution **System** where such **Network Operator's** distribution **System** comprises solely of **Plant** and **Apparatus** procured on or after 7 September 2018 and was connected to the **National Electricity Transmission System** on or after 18 August 2019. In this case, all connections to the **National Electricity Transmission System** would comprise only of **EU Grid Supply Points**; or<br><br>**Plant** and **Apparatus** at an **EU Grid Supply Point** owned or operated by a **Non-Embedded Customer** where such **Non-Embedded Customer** is defined as an **EU Code User**;<br><br>In the form provided by **The Company** to the relevant **User** or another format as agreed between the **User** and **The Company**. |
| **Configuration 1 AC Connected Offshore Power Park Module** | One or more **Offshore Power Park Modules** that are connected to an AC **Offshore Transmission System** and that AC **Offshore Transmission System** is connected to only one **Onshore** substation and which has one or more **Transmission Interface Points**. |
| **Configuration 2 AC Connected Offshore Power Park Module** | One or more **Offshore Power Park Modules** that are connected to a meshed AC **Offshore Transmission System** and that **AC Offshore Transmission System** is connected to two or more **Onshore** substations at its **Transmission Interface Points**. |

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| **Configuration 1 DC Connected Power Park Module** | One or more **DC Connected Power Park Modules** that are connected to an **HVDC System** or **Transmission DC Converter** and that **HVDC System** or **Transmission DC Converter** is connected to only one **Onshore** substation and which has one or more **Transmission Interface Points**. |
| **Configuration 2 DC Connected Power Park Module** | One or more **DC Connected Power Park Modules** that are connected to an **HVDC System** or **Transmission DC Converter** and that **HVDC System** or **Transmission DC Converter** is connected to more than one **Onshore** substation at its **Transmission Interface Points**. |
| **Connection Conditions** or **CC** | That portion of the Grid Code which is identified as the **Connection Conditions** being applicable to **GB Code Users**. |
| **Connection Entry Capacity** | Has the meaning set out in the **CUSC**. |
| **Connected Planning Data** | Data which replaces data containing estimated values assumed for planning purposes by validated actual values and updated estimates for the future and by updated forecasts for **Forecast Data** items such as **Demand**. |
| **Connection Point** | A **Grid Supply Point** or **Grid Entry Point**, as the case may be. |
| **Connection Site** | A **Transmission Site** or **User Site**, as the case may be. |
| **Construction Agreement** | Has the meaning set out in the **CUSC** |
| **Consumer Representative** | Means the person appointed by the **Citizens Advice** or the **Citizens Advice Scotland** (or any successor body) representing all categories of customers, appointed in accordance with GR.4.2(b) |
| **Contingency Reserve** | The margin of generation over forecast **Demand** which is required in the period from 24 hours ahead down to real time to cover against uncertainties in **Large Power Station** availability and against both weather forecast and **Demand** forecast errors. |
| **Control Based Reactive Power** | The **Reactive Power** supplied by a **Grid Forming Plant** through controlled means based on operator adjustment selectable setpoints (these may be manual or automatic). |
| **Control Calls** | Telephone calls whose destination and/or origin is a **Control Centre** or **Control Point**, either from dedicated control desk telephone systems or dedicated telephone handsets, and which, for the purpose of **Control Telephony**, have the right to exercise priority over (ie. disconnect) a call of a lower status. |
| **Control Centre** | A location used for the purpose of control and operation of the **National Electricity Transmission System** or **DC Converter Station** owner's **System** or **HVDC System Owner's System** or a **User System** other than a **Generator's System** or an **External System**. |
| **Control Engineer** | A person nominated by the relevant party for the control of its **Plant** and **Apparatus**. |
| **Control Person** | The term used as an alternative to "**Safety Co-ordinator**" on the **Site Responsibility Schedule** only. |

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| **Control Phase** | The **Control Phase** follows on from the **Programming Phase** and covers the period down to real time. |
| **Control Point** | The point from which:-<br>(a) A **Non-Embedded Customer's Plant** and **Apparatus** is controlled; or<br>(b) A **BM Unit** at a **Large Power Station** or at a **Medium Power Station** or representing a **Cascade Hydro Scheme** or with a **Demand Capacity** with a magnitude of:<br>(i) 50MW or more in **NGET's Transmission Area**; or<br>(ii) 30MW or more in **SPT's Transmission Area**; or<br>(iii) 10MW or more in **SHETL's Transmission Area**,<br>(iv) 10MW or more which is connected to an **Offshore Transmission System**<br>is physically controlled by a **BM Participant**; or<br>(c) In the case of any other **BM Unit** or **Generating Unit** (which could be part of a **Power Generating Module**), data submission is co-ordinated for a **BM Participant** and instructions are received from **The Company**,<br>as the case may be. For a **Generator**, this will normally be at a **Power Station** but may be at an alternative location agreed with **The Company**. In the case of a **DC Converter Station** or **HVDC System**, the **Control Point** will be at a location agreed with **The Company**. In the case of a **BM Unit** of an **Interconnector User**, the **Control Point** will be the **Control Centre** of the relevant **Externally Interconnected System Operator**. |
| **Control Telephony** | The principal method by which a **User's Responsible Engineer/Operator**, the relevant **Transmission Licensees' Control Engineers** and **The Company's Control Engineers** speak to one another for the purposes of control of the **Total System** in both normal and emergency operating conditions. |
| **Core Industry Document** | As defined in the **ESO Licence.** |
| **Core Industry Document Owner** | In relation to a **Core Industry Document**, the body(ies) or entity(ies) responsible for the management and operation of procedures for making changes to such document |

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| **Critical Tools and Facilities** | **Apparatus** and tools required in relation to **System Restoration**:<br>a) In the case of **The Company** include, but are not limited to:<br>i) Tools for operating and monitoring the **Transmission System** including but not limited to state estimation, the **Balancing Mechanism**, **Load** and **System Frequency** control, alarms, real time system operation and operational security analysis including off line transmission analysis;<br>ii) The ability to control, protect and monitor transmission assets including switchgear, tap changers and other **Transmission System** equipment including where available auxiliary equipment and to ensure the safe operation of **Plant** and **Apparatus** and the safety of personnel;<br>iii) **Control Telephony** systems as provided for in CC.6.5.1 – CC.6.5.5 and ECC.6.5.1 – ECC.6.5.5;<br>iv) Operational telephony as provided for in STCP 04-5; and<br>v) Tools and communications systems to facilitate cross border operations.<br>b) In the case of **Generators**, **HVDC System Owners**, **DC Converter Station Owners**, **Defence Service Providers** and **Restoration Contractors**:<br>i) Tools for monitoring relevant **Plant** and **Apparatus**;<br>ii) The ability to control, protect and monitor their **Plant** and **Apparatus** necessary for **System Restoration** including as applicable primary **Plant**, switchgear, tap changers and other auxiliary equipment and to ensure the safe operation of **Plant** and personnel; and<br>iii) **Control Telephony** as provided for in CC.6.5.1 – CC.6.5.5 and ECC.6.5.1 – ECC.6.5.5.<br>c) In the case of **BM Participants** and **Virtual Lead Parties** who are not **Generators**, **HVDC System Owners**, **DC Converter Station** owners, **Defence Service Providers** or **Restoration Contractors** as provided for in item b) above:<br>i) Tools for monitoring relevant **Plant** and **Apparatus** (excluding **Plant** and **Apparatus** not owned by the **BM Participant** or **Virtual Lead Party**); and<br>ii) **Control Telephony** as provided for in CC.6.5.1 – CC.6.5.5 and ECC.6.5.1 – ECC.6.5.5<br>d) In the case of **Network Operators**:<br>i) Control room **Apparatus** and tools for monitoring their **System** including but not limited to, alarms, real time system operation and operational security analysis including off line network analysis;<br>ii) The ability to control, protect and monitor those assets necessary for **System Restoration** including switchgear, tap changers and other network equipment including where available auxiliary equipment and to ensure the safe operation of **Plant** and personnel; and<br>iii) **Control Telephony** as provided for in CC.6.5.1 – CC.6.5.5 and ECC.6.5.1 – ECC.6.5.5.<br>e) In the case of **Non-Embedded Customers**:<br>i) Tools for monitoring their **System** including but not limited to, alarms and real time system operation; |

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| | ii) The ability to control, protect and monitor those assets necessary for **System Restoration** including switchgear, tap changers and other network equipment including where available auxiliary equipment and to ensure the safe operation of **Plant** and personnel; and<br>iii) **Control Telephony** as provided for in CC.6.5.1 – CC.6.5.5 and ECC.6.5.1 – ECC.6.5.5. |
| **CUSC** | Has the meaning set out in the **ESO Licence.** |
| **CUSC Contract** | One or more of the following agreements as envisaged in condition E2 of the **ESO Licence**:<br>(a) the **CUSC Framework Agreement**;<br>(b) a **Bilateral Agreement**;<br>(c) a **Construction Agreement**<br>or a variation to an existing **Bilateral Agreement** and/or **Construction Agreement**; |
| **CUSC Framework Agreement** | Has the meaning set out in the **ESO Licence**. |
| **CUSC Party** | As defined in the **ESO Licence** and "CUSC Parties" shall be construed accordingly. |
| **Customer** | A person to whom electrical power is provided (whether or not they are the same person as the person who provides the electrical power). |
| **Customer Demand Management** | Reducing the supply of electricity to a **Customer** or disconnecting a **Customer** in a manner agreed for commercial purposes between a **Supplier** and its **Customer**. |
| **Customer Demand Management Notification Level** | The level above which a **Supplier** has to notify **The Company** of its proposed or achieved use of **Customer Demand Management** which is 12 MW in England and Wales and 5 MW in Scotland. |
| **Customer Generating Plant** | A **Power Station** or **Generating Unit** or **Power Generating Module** of a **Customer** to the extent that it operates the same exclusively to supply all or part of its own electricity requirements, and does not export electrical power to any part of the **Total System**. |
| **Damping Factor** (ζ) | The ratio of the actual damping to critical damping.<br>For a **GBGF-I** the open loop phase angle, for an open loop gain of one, is measured from the systems **Nichols Chart**.<br>This angle is used to define the system's equivalent **Damping Factor** that is the same as the **Damping Factor** of a second order system with the same open loop phase angle.<br>Alternatively, the **Damping Factor** refers to the damping of a specific oscillation mode that is associated with the second order system created by the power to angle transfer function as show in Figure PC.A.5.8.1(a) and PCA.5.8.1(b). |

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| **Data Publisher** | The person providing a reporting service, in relation to data which is submitted to the reporting service under OC2.4.2.3 or a **Transmission Licensee**, in relation to data which the **Transmission Licensee** is required to publish. |
| **Data Registration Code** or **DRC** | That portion of the Grid Code which is identified as the **Data Registration Code**. |
| **Data Validation, Consistency and Defaulting Rules** | The rules relating to validity and consistency of data, and default data to be applied, in relation to data submitted under the **Balancing Codes**, to be applied by **The Company** under the **Grid Code** as set out in the document "Data Validation, Consistency and Defaulting Rules" - Issue 8, dated 25th January 2012. The document is available on The Company's website or upon request from **The Company**. |
| **DC Connected Power Park Module** | A **Power Park Module** that is connected to one or more **HVDC Interface Points**. |
| **DC Converter** | Any **Onshore DC Converter** or **Offshore DC Converter** as applicable to **GB Code User's**. |
| **DC Converter Station** | An installation comprising one or more **Onshore DC Converters** connecting a direct current interconnector:<br>to the **National Electricity Transmission System**; or,<br>(if the installation has a rating of 50MW or more) to a **User System**,<br>and it shall form part of the **External Interconnection** to which it relates. |
| **DC Network** | All items of **Plant** and **Apparatus** connected together on the direct current side of a **DC Converter** or **HVDC System**. |
| **DCUSA** | The Distribution Connection and Use of System Agreement approved by the **Authority** and required to be maintained in force by each **Electricity Distribution Licence** holder. |
| **Defence Service Provider** | A **User** with a legal or contractual obligation to provide a service contributing to one or several measures of the **System Defence Plan** or a party with a contract to meet one or more measures of the **System Defence Plan**. |
| **Defined Active Damping Power** | The **Active Damping Power** supplied by a **GBGF-I** when it is operating at the **Grid Oscillation Value** defined in Table PC.A.5.8.2 |
| **De-Load** | The condition in which a **Genset** has reduced or is not delivering electrical power to the **System** to which it is **Synchronised**. |
| $\Delta f$ | Deviation from **Target Frequency** |
| **Demand** | The demand of MW and MVAr of electricity (i.e. both **Active** and **Reactive Power**), unless otherwise stated. |
| **Demand Aggregation** | A process where one or more **Demand Facilities** or **Closed Distribution Systems** can be controlled by a **Demand Response Provider** either as a single facility or **Closed Distribution System** for the purposes of offering one or more **Demand Response Services.** |

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| **Demand Capacity** | Has the meaning as set out in the **BSC**. |
| **Demand Control** | Any or all of the following methods of achieving a **Demand** reduction:<br>(a) **Customer** voltage reduction initiated by **Network Operators** (other than following an instruction from **The Company**);<br>(b) **Customer Demand** reduction by **Disconnection** initiated by **Network Operators** (other than following an instruction from **The Company**);<br>(c) **Demand** reduction instructed by **The Company**;<br>(d) automatic low **Frequency Demand Disconnection**;<br>(e) emergency manual **Demand Disconnection**. |
| **Demand Control Notification Level** | The level above which a **Network Operator** has to notify **The Company** of its proposed or achieved use of **Demand Control** which is 12 MW in England and Wales and 5 MW in Scotland. |
| **Demand Facility** | A facility which consumes electrical energy and is connected at one or more **Grid Supply Points** to the **National Electricity Transmission System** or connection points to a **Network Operator's System**. A **Network Operator's System** and/or auxiliary supplies of a **Power Generating Module** do no constitute a **Demand Facility**. |
| **Demand Facility Owner** | A person who owns or operates one or more **Demand Units** within a **Demand Facility**. A **Demand Facility Owner** who owns or operates a **Demand Facility** which is directed connected to the **Transmission System** shall be treated as a **Non-Embedded Customer**. |
| **Demand Response Active Power Control** | **Demand** within a **Demand Facility** or **Closed Distribution System** that is available for modulation by **The Company** or **Network Operator** or **Relevant Transmission Licensee**, which results in an **Active Power** modification. |
| **Demand Response Provider** | A party (other than **The Company**) who owns, operates, controls or manages **Main Plant and Apparatus** (excluding storage equipment) which was first connected to the **Total System** on or after 18 August 2019 and who had placed **Purchase Contracts** for its **Main Plant and Apparatus** on or after 7 September 2018 or is the subject of a **Substantial Modification** on or after 18 August 2019 and has an agreement with **The Company** to provide a **Demand Response Service**(s). The party may be one or more **Customers**, a **Network Operator** or **Non-Embedded Customer** or **EU Code User** contracting bilaterally with **The Company** for the provision of services, or may be a third party providing **Demand Aggregation** from many individual **Customers**. |
| **Demand Response Reactive Power Control** | A **Demand Response Service** derived from **Reactive Power** or **Reactive Power** compensation devices in a **Demand Facility** or **Closed Distribution System** that are available for modulation by **The Company** or **Network Operator** or **Relevant Transmission Licensee**. |
| **Demand Response Transmission Constraint Management** | A **Demand Response Service** derived from **Demand** within a **Demand Facility** or **Closed Distribution System** that is available for modulation by **The Company** or **Network Operator** or **Relevant Transmission Licensee** to manage transmission constraints within the **System**. |

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| **Demand Response Service** | A **Demand Response Service** includes one of more of the following services:<br><br>(a) **Demand Response Active Power Control**;<br>(b) **Demand Response Reactive Power Control**;<br>(c) **Demand Response Transmission Constraint Management**;<br>(d) **Demand Response System Frequency Control**;<br>(e) **Demand Response Very Fast Active Power Control**.<br><br>The above **Demand Response Services** are not exclusive and do not preclude **Demand Response Providers** from negotiating other services for demand response capability with **The Company**. Where such services are negotiated they would still be treated as a **Demand Response Service**. |
| **Demand Response Services Code (DRSC)** | That portion of the Grid Code which is identified as the **Demand Response Services Code** being applicable to **Demand Response Providers**. |
| **Demand Response System Frequency Control** | A **Demand Response Service** derived from a **Demand** within one or more **Demand Facilities** or **Closed Distribution Systems** that is available for the reduction or increase in response to **Frequency** fluctuations, made by an autonomous response from those **Demand Facilities** or **Closed Distribution Systems** to diminish these fluctuations. |
| **Demand Response Unit Document (DRUD)** | A document, issued either by the **Non-Embedded Customer**, **Demand Facility Owner** or the **CDSO** to **The Company** or the **Network Operator** (as the case may be) for **Demand Units** with demand response and providing a **Demand Response Service** which confirms the compliance of the **Demand Unit** with the technical requirements set out in the Grid Code and provides the necessary data and statements, including a statement of compliance. |
| **Demand Response Very Fast Active Power Control** | A **Demand Response Service** derived from **a Demand** within a **Demand Facility** or **Closed Distribution System** that can be modulated very fast in response to a **Frequency** deviation, which results in a very fast **Active Power** modification. |
| **Demand Unit** | An indivisible set of installations containing equipment which can be actively controlled at one or more sites by a **Demand Response Provider**, **Demand Facility Owner**, **CDSO** or by a **Non Embedded Customer**, either individually or commonly as part of **Demand Aggregation** through a third party who has agreed to provide **Demand Response Services**. |
| **Designated Information Exchange System** | A facsimile machine or, as agreed between each **User** with respect to their **Control Centre**, **Trading Point** or **Control Point** and **The Company**, an **Electronic Communication Platform** that facilitates the exchange of information between a **User** and **The Company**. |
| **Designed Minimum Operating Level** | The output (in whole MW) below which a **Genset** or a **DC Converter** at a **DC Converter Station** (in any of its operating configurations) has no **High Frequency Response** capability. |
| **De-Synchronise** | (a) The act of taking a **Power Generating Module** (including a **DC Connected Power Park Module**), **Generating Unit**, **Power Park Module**, **HVDC System** or **DC Converter** off a **System** to which it has been **Synchronised**, by opening any connecting circuit breaker; or<br><br>(b) The act of ceasing to consume electricity at an importing **BM Unit**;<br><br>and the term "**De-Synchronising**" shall be construed accordingly. |

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| **De-synchronised Island Procedure** | A formal procedure as set out in OC9.5.4 for the purpose of **Synchronising Power Islands** |
| **Detailed Planning Data** | Detailed additional data which **The Company** requires under the **PC** in support of **Standard Planning Data**, comprising **DPD I** and **DPD II**. |
| **Detailed Planning Data Category I** or **DPD I** | The **Detailed Planning Data** categorised as such in the **DRC**, and submitted in accordance with PC.4.4.2 or PC.4.4.4 as applicable. |
| **Detailed Planning Data Category II** or **DPD II** | The **Detailed Planning Data** categorised as such in the **DRC**, and submitted in accordance with PC.4.4.2 or PC.4.4.4 as applicable. |
| **Disconnection** | The physical separation of **Users** (or **Customers**) from the **National Electricity Transmission System** or a **User System** as the case may be. |
| **Discrimination** | The quality where a relay or protective system is enabled to pick out and cause to be disconnected only the faulty **Apparatus**. |
| **Disputes Resolution Procedure** | The procedure described in the **CUSC** relating to disputes resolution. |
| **Distribution Code** | The distribution code required to be drawn up by each **Electricity Distribution Licence** holder and approved by the **Authority**, as from time to time revised with the approval of the **Authority**. |
| **Distribution Restoration Contract** | An agreement between an **Anchor Plant Owner** or **Top Up Restoration Contractor** and **The Company** and a **Network Operator** under which the **Anchor Restoration Contractor** or **Top Up Restoration Contractor**, on instruction, provides a service to energise and/or contribute to the establishment of a **Distribution Restoration Zone**. |
| **Distribution Restoration Zone** | Part of a **Network Operator's System** which is capable of being energised by an **Anchor Plant** following a **Total System Shutdown** or **Partial System Shutdown**. The **Distribution Restoration Zone** shall contain an **Anchor Plant** and may also include one or more **Top Up Restoration Contractor's Plants**. The **Distribution Restoration Zone** primarily comprises part of the **Network Operator's System** but may include relevant parts of the **National Electricity Transmission System** in which case **Relevant Transmission Licensees** would be party to the **Distribution Restoration Zone Plan**. |
| **Distribution Restoration Zone Control System (DRZCS)** | A mains-independent automatic control and supervisory system which assesses the status and operational conditions of part of a **Network Operator's System** and where relevant, part of the **Transmission System** for the purposes of operating **Restoration Contractor's Plant** and **Apparatus** and/or modulating **Restoration Contractors' Demand** in addition to operating items of the **Network Operator's Plant** and **Apparatus** and relevant **Transmission Licensee's Plant** and **Apparatus** for the purposes of establishing and operating a **Distribution Restoration Zone**. |

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| **Distribution Restoration Zone Plan** | A plan produced and agreed by a **Network Operator**, **The Company**, **Restoration Contractors** and in certain situations a **Transmission Licensees** under OC9.4.7.7, detailing the agreed method and procedure by which a **Network Operator** will instruct a **Restoration Contractor** with an **Anchor Plant** to energise, part of a **Network Operator's System Total System** within 8 hours of that instruction, and subsequently meet complementary blocks of local **Demand** so as to form a **Power Island**. A **Distribution Restoration Zone Plan** may require the use of **Top Up Restoration Plant**.<br><br>A **Distribution Restoration Zone Plan** is distinct from and falls outside the provisions of a **Local Joint Restoration Plan**. |
| **Droop** | The ratio of the per unit steady state change in speed (or **Frequency**), to the per unit steady state change in **Active Power** output. Whilst not mandatory, it is often common practice to express **Droop** in percentage terms. |
| **Dynamic Parameters** | Those parameters listed in Appendix 1 to **BC1** under the heading **BM Unit Data** – **Dynamic Parameters**. |
| **Dynamic Reactive Compensation Equipment** | **Plant** and **Apparatus** capable of injecting or absorbing **Reactive Power** in a controlled manner which includes but is not limited to Synchronous Compensators, Static Var Compensators (SVC), or STATCOM devices. |
| **E&W Offshore Transmission System** | An **Offshore Transmission System** with an **Interface Point** in England and Wales. |
| **E&W Offshore Transmission Licensee** | A person who owns or operates an **E&W Offshore Transmission System** pursuant to a **Transmission Licence**. |
| **E&W Transmission System** | Collectively **NGET's Transmission System**, any **Competitively Appointed Transmission Licensee's Transmission System** with **Plant** and **Apparatus** located in **NGET's Transmission Area** and any **E&W Offshore Transmission Systems**. |
| **E&W User** | A **User** in **England** and **Wales** or any **Offshore User** who owns or operates **Plant** and/or **Apparatus** connected (or which will at the **OTSUA Transfer Time** be connected) to an **E&W Offshore Transmission System**. |
| **Earth Fault Factor** | At a selected location of a three-phase **System** (generally the point of installation of equipment) and for a given **System** configuration, the ratio of the highest root mean square phase-to-earth power **Frequency** voltage on a sound phase during a fault to earth (affecting one or more phases at any point) to the root mean square phase-to-earth power **Frequency** voltage which would be obtained at the selected location without the fault. |

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| **Earthing** | A way of providing a connection between conductors and earth by an **Earthing Device** which is either:<br>(a) Immobilised and **Locked** in the earthing position. Where the **Earthing Device** is **Locked** with a **Safety Key**, the **Safety Key** must be secured in a **Key Safe** and the **Key Safe Key** must be, where reasonably practicable, given to the authorised site representative of the **Requesting Safety Co-ordinator** and is to be retained in safe custody. Where not reasonably practicable the **Key Safe Key** must be retained by the authorised site representative of the **Implementing Safety Co-ordinator** in safe custody; or<br>(b) maintained and/or secured in position by such other method which must be in accordance with the **Local Safety Instructions** of **NGET** or the **Safety Rules** of the **Relevant Transmission Licensee** or that **User**, as the case may be. |
| **Earthing Device** | A means of providing a connection between a conductor and earth being of adequate strength and capability. |
| **Elected Panel Members** | Shall mean the following **Panel Members** elected in accordance with GR4.2(a):<br>(a) the representative of the **Suppliers**;<br>(b) the representative of the **Onshore Transmission Licensees**;<br>(c) the representative of the **Offshore Transmission Licensees**; and<br>(d) the representatives of the **Generators** |
| **Electrical Standard** | A standard listed in the Annex to the **General Conditions**. |
| **Electricity Balancing Regulation** | as defined in the **CUSC**. |
| **Electricity Council** | That body set up under the Electricity Act, 1957. |
| **Electricity Distribution Licence** | The licence granted pursuant to Section 6(1) (c) of the **Act**. |
| **Electricity Regulation** | As defined in the **ESO Licence.** |
| **Electricity Storage** | The conversion of electrical energy into a form of energy which can be stored, the storing of that energy, and the subsequent reconversion of that energy back into electrical energy. |
| **Electricity Storage Module** | Is either one or more **Synchronous Electricity Storage Unit**(s) or **Non-Synchronous Electricity Storage Unit**(s) which could also be part of a **Power Generating Module**. For the avoidance of doubt, **Non-Controllable Electricity Storage Equipment** would not be considered to be classed as an **Electricity Storage Module** or as an **Electricity Storage Unit**. |
| **Electricity Storage Unit** | A **Synchronous Electricity Storage Unit** or **Non-Synchronous Electricity Storage Unit**. |
| **Electricity Supply Licence** | The licence granted pursuant to Section 6(1) (d) of the **Act**. |

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| **Electricity System Operator Licence or ESO Licence** | Means a licence granted or treated as granted under section 6(1)(da) of the **Act.** |
| **Electricity System Restoration Standard** | As defined in Special Condition 2.2 of **The Company's** Transmission Licence. |
| **Electricity Ten Year Statement** | A statement of network development information, prepared annually by **The Company** in accordance with the terms of the **ESO Licence** condition C12 for each of the nine succeeding financial years. |
| **Electromagnetic Compatibility Level** | Has the meaning set out in **Engineering Recommendation** G5. |
| **Electronic Communication Platform** | An information exchange platform established, provided, and maintained by **The Company** that facilitates the exchange of information between a **User** and **The Company**. |
| **Electronic Power Converter** | Electrical **Plant and Apparatus** which uses switched solid state power electronic devices to produce a real voltage waveform, that has a fundamental component with harmonics. |
| **Embedded** | Having a direct connection to a **User System** or the **System** of any other **User** to which **Customers** and/or **Power Stations** are connected, such connection being either a direct connection or a connection via a busbar of another **User** or of a **Relevant Transmission Licensee** (but with no other connection to the **National Electricity Transmission System**). |
| **Embedded Development** | Has the meaning set out in PC.4.4.3(a). |
| **Embedded Development Agreement** | An agreement entered into between a **Network Operator** and an **Embedded Person**, identifying the relevant site of connection to the **Network Operator's System** and setting out other site specific details in relation to that use of the **Network Operator's System**. |
| **Embedded Generation Control** | Any or all of the following methods by which a **Network Operator** can achieve a reduction in the **Active Power** output of **Embedded Power Stations** to implement an instruction issued by **The Company**:<br><br>(a) **Embedded Generation De-energisation**; or<br>(b) where this is achievable in a suitable timescale to comply with an instruction, arranging to reduce the **Active Power** output of **Embedded Power Stations** or **Embedded Generator Unit(s)** connected to their **System.** |
| **Embedded Generation Deenergisation** | The de-energisation by **Network Operators** of one or more **Embedded Power Stations** or **Embedded Generating Units** from their **System** as part of an **Embedded Generation Control** action. |
| **Embedded Person** | The party responsible for a **Medium Power Station** not subject to a **Bilateral Agreement** or **DC Converter Station** not subject to a **Bilateral Agreement** or **HVDC System** not subject to a **Bilateral Agreement** connected to or proposed to be connected to a **Network Operator's System**. |
| **Emergency Deenergisation Instruction** | An **Emergency Instruction** issued by **The Company** to **De-Synchronise** a **Power Generating Module** (including a **DC Connected Power Park Module**), **Generating Unit**, **Power Park Module, HVDC System** or **DC Converter** in circumstances specified in the **CUSC**. |

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| **Emergency Instruction** | An instruction issued by **The Company** in emergency circumstances, pursuant to BC2.9, to the **Control Point** of a **User**. In the case of such instructions applicable to a **BM Unit**, it may require an action or response which is outside the **Dynamic Parameters** or **Other Relevant Data**, and may include an instruction to trip a **Genset**. |
| **EMR Administrative Parties** | Has the meaning given to "administrative parties" in The Electricity Capacity Regulations 2014 and each **CfD Counterparty** and **CfD Settlement Services Provider**. |
| **EMR Documents** | The Energy Act 2013, The Electricity Capacity Regulations 2014, the **Capacity Market Rules**, The Contracts for Difference (Allocation) Regulations 2014, The Contracts for Difference (Definition of Eligible Generator) Regulations 2014, The Contracts for Difference (Electricity Supplier Obligations) Regulations 2014, The Electricity Market Reform (General) Regulations 2014, the **AF Rules** and any other regulations or instruments made under Chapter 2 (contracts for difference), Chapter 3 (capacity market) or Chapter 4 (investment contracts) of Part 2 of the Energy Act 2013 which are in force from time to time. |
| **EMR Functions** | Has the meaning given to "EMR functions" in Chapter 5 of Part 2 of the Energy Act 2013. |
| **Engineering Recommendations** | The documents referred to as such and issued by the Energy Networks Association or the former Electricity Council. |
| **Engineering Recommendation G5** | Means Engineering Recommendation G5/5. |
| **Energisation Operational Notification** or **EON** | A notification (in respect of **Plant** and **Apparatus** (including **OTSUA**) which is directly connected to the **National Electricity Transmission System**) from **The Company** to a **User** confirming that the **User** can in accordance with the **Bilateral Agreement** and/or **Construction Agreement**, energise such **User's Plant** and **Apparatus** (including **OTSUA**) specified in such notification. |
| **Equipment Certificate** | A document issued by an **Authorised Certifier** for equipment used by a **Power Generating Module**, **Demand Unit**, **Network Operators System**, **Non-Embedded Customers System**, **Demand Facility** or **HVDC System**. The **Equipment Certificate** defines the scope of its validity at a national level. For the purpose of replacing specific parts of the compliance process, the **Equipment Certificate** may include models or equivalent information that have been verified against actual test results. |
| **Estimated Registered Data** | Those items of **Standard Planning Data** and **Detailed Planning Data** which either upon connection will become **Registered Data**, or which for the purposes of the **Plant** and/or **Apparatus** concerned as at the date of submission are **Registered Data**, but in each case which for the nine succeeding **Financial Years** will be an estimate of what is expected. |

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| **EU Code User** | A **User** who is any of the following:-<br><br>(a) A **Generator** in respect of a **Power Generating Module** (excluding a **DC Connected Power Park Module**) or **OTSDUA** (in respect of an AC **Offshore Transmission System**) whose **Main Plant and Apparatus** is connected to the **System** on or after 27 April 2019 and who concluded **Purchase Contracts** for its **Main Plant and Apparatus** on or after 17 May 2018<br><br>(b) A **Generator** in respect of any **Type C** or **Type D Power Generating Module** which is the subject of a **Substantial Modification** which is effective on or after 27 April 2019.<br><br>(c) A **Generator** in respect of any **DC Connected Power Park Module** whose **Main Plant and Apparatus** is connected to the **System** on or after 8 September 2019 and who had concluded **Purchase Contracts** for its **Main Plant and Apparatus** on or after 28 September 2018.<br><br>(d) A **Generator** in respect of any **DC Connected Power Park Module** which is the subject of a **Substantial Modification** which is effective on or after 8 September 2019.<br><br>(e) An **HVDC System Owner** or **OTSDUA** (in respect of a DC **Offshore Transmission System** including a **Transmission DC Converter**) whose **Main Plant and Apparatus** is connected to the **System** on or after 8 September 2019 and who had concluded **Purchase Contracts** for its **Main Plant and Apparatus** on or after 28 September 2018.<br><br>(f) An **HVDC System Owner** or **OTSDUA** (in respect of a DC **Offshore Transmission System** including a **Transmission DC Converter**) whose **HVDC System** or DC **Offshore Transmission System** including a **Transmission DC Converter**) is the subject of a **Substantial Modification** on or after 8 September 2019.<br><br>(g) A **User** which the **Authority** has determined should be considered as an **EU Code User**.<br><br>(h) A **Network Operator** whose entire distribution **System** was first connected to the **National Electricity Transmission System** on or after 18 August 2019 and who had placed **Purchase Contracts** for its **Main Plant** and **Apparatus** in respect of its entire distribution **System** on or after 7 September 2018. For the avoidance of doubt, a **Network Operator** will be an **EU Code User** if its entire distribution **System** is connected to the **National Electricity Transmission System** at **EU Grid Supply Points** only.<br><br>(i) A **Non-Embedded Customer** whose **Main Plant and Apparatus** at each **EU Grid Supply Point** was first connected to the **National Electricity Transmission System** on or after 18 August 2019 and who had placed **Purchase Contracts** for its **Main Plant and Apparatus** at each **EU Grid Supply Point** on or after 7 September 2018 or is the subject of a **Substantial Modification** on or after 18 August 2019.<br><br>(j) A **Storage User** in respect of an **Electricity Storage Module** whose **Main Plant** and **Apparatus** is connected to the **System** on or after 20 May 2020 and who concluded **Purchase** |

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| | **Contracts** for its **Main Plant** and **Apparatus** on or after 20 May 2019. |
| **EU Generator** | A **Generator** or **OTSDUA** who is also an **EU Code User**. |
| **EU Grid Supply Point** | A **Grid Supply Point** where either:-<br>(i) (a) the **Network Operator** or **Non-Embedded Customer** had placed **Purchase Contracts** for all of its **Plant** and **Apparatus** at that **Grid Supply Point** on or after 7 September 2018, and<br>(b) All of the **Network Operator's** or **Non-Embedded Customer's Plant** and **Apparatus** at that **Grid Supply Point** was first connected to the **Transmission System** on or after 18 August 2019; or<br>(ii) the **Network Operator's** or **Non-Embedded Customer's Plant** and **Apparatus** at a **Grid Supply Point** is the subject of a **Substantial Modification** which is effective on or after 18 August 2019. |
| **EU Transparency Availability Data** | Such relevant data as **Customers** and **Generators** are required to provide under Articles 7.1(a) and 7.1(b) and Articles 15.1(a), 15.1(b), 15.1(c), 15.1(d) of **Assimilated Law** (Commission Regulation (EU) 543/2013), and which also forms part of **DRC** Schedule 6 (**User**s' Outage Data). |
| **European Compliance Processes** or **ECP** | That portion of the Grid Code which is identified as the **European Compliance Processes**. |
| **European Connection Conditions** or **ECC** | That portion of the Grid Code which is identified as the **European Connection Conditions** being applicable to **EU Code Users**. |
| **European Specification** | A common technical specification, a **British Standard** implementing a European standard or a European technical approval. The terms "common technical specification", "European standard" and "European technical approval" shall have the meanings respectively ascribed to them in the **Regulations**. |
| **Event** | An unscheduled or unplanned (although it may be anticipated) occurrence on, or relating to, a **System** (including **Embedded Power Stations**) including, without limiting that general description, faults, incidents and breakdowns and adverse weather conditions being experienced. |
| **Exciter** | The source of the electrical power providing the field current of a synchronous machine. |
| **Excitation System** | The equipment providing the field current of a machine, including all regulating and control elements, as well as field discharge or suppression equipment and protective devices. |
| **Excitation System No-Load Negative Ceiling Voltage** | The minimum value of direct voltage that the **Excitation System** is able to provide from its terminals when it is not loaded, which may be zero or a negative value. |

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| **Excitation System Nominal Response** | Shall have the meaning ascribed to that term in **IEC** 34-16-1:1991 [equivalent to **British Standard BS**4999 Section 116.1: 1992]. The time interval applicable is the first half-second of excitation system voltage response. |
| **Excitation System On-Load Positive Ceiling Voltage** | Shall have the meaning ascribed to the term 'Excitation system on load ceiling voltage' in **IEC** 34-16-1:1991[equivalent to **British Standard BS**4999 Section 116.1: 1992]. |
| **Excitation System No-Load Positive Ceiling Voltage** | Shall have the meaning ascribed to the term 'Excitation system no load ceiling voltage' in **IEC** 34-16-1:1991[equivalent to **British Standard BS**4999 Section 116.1: 1992]. |
| **Exemptable** | Has the meaning set out in the **CUSC**. |
| **Existing AGR Plant** | The following nuclear advanced gas cooled reactor plant (which was commissioned and connected to the **Total System** at the **Transfer Date**):-<br>(a) Dungeness B<br>(b) Hinkley Point B<br>(c) Heysham 1<br>(d) Heysham 2<br>(e) Hartlepool<br>(f) Hunterston B<br>(g) Torness |
| **Existing AGR Plant Flexibility Limit** | In respect of each **Genset** within each **Existing AGR Plant** which has a safety case enabling it to so operate, 8 (or such lower number which when added to the number of instances of reduction of output as instructed by **The Company** in relation to operation in **Frequency Sensitive Mode** totals 8) instances of flexibility in any calendar year (or such lower or greater number as may be agreed by the Nuclear Installations Inspectorate and notified to **The Company**) for the purpose of assisting in the period of low **System NRAPM** and/or low **Localised NRAPM** provided that in relation to each **Generating Unit** each change in output shall not be required to be to a level where the output of the reactor is less than 80% of the reactor thermal power limit (as notified to **The Company** and which corresponds to the limit of reactor thermal power as contained in the "Operating Rules" or "Identified Operating Instructions" forming part of the safety case agreed with the Nuclear Installations Inspectorate). |
| **Existing Gas Cooled Reactor Plant** | Both **Existing Magnox Reactor Plant** and **Existing AGR Plant**. |

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| **Existing Magnox Reactor Plant** | The following nuclear gas cooled reactor plant (which was commissioned and connected to the **Total System** at the **Transfer Date**):-<br>(a) Calder Hall<br>(b) Chapelcross<br>(c) Dungeness A<br>(d) Hinkley Point A<br>(e) Oldbury-on-Severn<br>(f) Bradwell<br>(g) Sizewell A<br>(h) Wylfa |
| **Export and Import Limits** | Those parameters listed in Appendix 1 to **BC1** under the heading **BM Unit Data** – **Export and Import Limits**. |
| **External Interconnection** | **Apparatus** for the transmission of electricity to or from the **National Electricity Transmission System** or a **User System** into or out of an **External System**. For the avoidance of doubt, a single **External Interconnection** may comprise several circuits operating in parallel. |
| **External Interconnection Circuit** | **Plant** or **Apparatus** which comprises a circuit and which operates in parallel with another circuit and which forms part of the **External Interconnection**. |
| **Externally Interconnected System Operator** or **EISO** | A person who operates an **External System** which is connected to the **National Electricity Transmission System** or a **User System** by an **External Interconnection**. |
| **External System** | In relation to an **Externally Interconnected System Operator** means the transmission or distribution system which it owns or operates which is located outside **the National Electricity Transmission System Operator Area** any **Apparatus** or **Plant** which connects that system to the **External Interconnection** and which is owned or operated by such **Externally Interconnected System Operator**. |
| **Fast Fault Current** | A current delivered by a **Power Park Module** or **HVDC System** during and after a voltage deviation caused by an electrical fault within the **System** with the aim of identifying a fault by network **Protection** systems at the initial stage of the fault, supporting **System** voltage retention at a later stage of the fault and **System** voltage restoration after fault clearance. |
| **Fault Current Interruption Time** | The time interval from fault inception until the end of the break time of the circuit breaker (as declared by the manufacturers). |
| **Fault Ride Through** | The capability of **Power Generating Modules** (including **DC Connected Power Park Modules**) and **HVDC Systems** to be able to remain connected to the **System** and operate through periods of low voltage at the **Grid Entry Point** or **User System Entry Point** caused by secured faults. |
| **Fast Start** | A start by a **Genset** with a **Fast Start Capability**. |
| **Fast Start Capability** | The ability of a **Genset** to be **Synchronised** and **Loaded** up to full **Load** within 5 minutes. |

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| **Fast Track Criteria** | A proposed Grid Code Modification Proposal that, if implemented,<br>(a) would meet the **Self-Governance Criteria**; and<br>(b) is properly a housekeeping modification required as a result of some error or factual change, including but not limited to:<br>(i) updating names or addresses listed in the **Grid Code**;<br>(ii) correcting any minor typographical errors;<br>(iii) correcting formatting and consistency errors, such as paragraph numbering; or<br>(iv) updating out of date references to other documents or paragraphs |
| **Fault Current Interruption Time** | The time interval from fault inception until the end of the break time of the circuit breaker (as declared by the manufacturers). |
| **Fault Ride Through** | The capability of **Power Generating Modules** (including **DC Connected Power Park Modules**) and **HVDC Systems** to be able to remain connected to the **System** and operate through periods of low voltage at the **Grid Entry Point** or **User System Entry Point** caused by secured faults. |
| **Final-Balancing Compliance Notification** | A notification from **The Company** to an **EU Generator** in respect of an **Embedded Small Power Station** with a **Bilateral Embedded Generation Agreement** with **The Company**, with a **Completion Date** on or after 05-09-2024, confirming that the **Generator** has demonstrated compliance with:<br>(a) **Engineering Recommendation** G99 supported by the final operational notification from the relevant **Network Operator**,<br>(b) the relevant sections of the Grid Code as applicable, and<br>(c) the **Bilateral Embedded Generation Agreement**,<br>and that all the items in the schedule of **Unresolved Issues** have been completed to **The Company**'s satisfaction. |
| **Final Generation Outage Programme** | An outage programme as agreed by **The Company** with each **Generator** and each **Interconnector Owner** at various stages through the **Operational Planning Phase** and **Programming Phase** which does not commit the parties to abide by it, but which at various stages will be used as the basis on which **National Electricity Transmission System** outages will be planned. |
| **Final Operational Notification** or **FON** | A notification from **The Company** to a **Generator** or **DC Converter Station** owner or **HVDC System Owner** or **Network Operator** or **Non-Embedded Customer** confirming that the **User** has demonstrated compliance:<br>(a) with the Grid Code, (or where they apply, that relevant derogations have been granted), and<br>(b) where applicable, with Appendices F1 to F5 of the **Bilateral Agreement**,<br>in each case in respect of the **Plant** and **Apparatus** specified in such notification. |

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| **Final Physical Notification Data** | Has the meaning set out in the **BSC**. |
| **Final Report** | A report prepared by the **Test Proposer** at the conclusion of a **System Test** for submission to **The Company** (if it did not propose the **System Test**) and other members of the **Test Panel**. |
| **Financial Year** | As defined in the **ESO Licence.** |
| **Fixed Proposed Implementation Date** | The proposed date(s) for the implementation of a **Grid Code Modification Proposal** or **Workgroup Alternative Grid Code Modification** such date to be a specific date by reference to an assumed date by which a direction from the **Authority** approving the **Grid Code Modification Proposal** or **Workgroup Alternative Grid Code Modification** is required in order for the **Grid Code Modification Proposal** or any **Workgroup Alternative Grid Code Modification**, if it were approved, to be implemented by the proposed date. |
| **Flicker Severity (Long Term)** | A value derived from 12 successive measurements of **Flicker Severity** (**Short Term**) (over a two hour period) and a calculation of the cube root of the mean sum of the cubes of 12 individual measurements, as further set out in **Engineering Recommendation** P28 as current at the **Transfer Date**. |
| **Flicker Severity (Short Term)** | A measure of the visual severity of flicker derived from the time series output of a flickermeter over a 10 minute period and as such provides an indication of the risk of **Customer** complaints. |
| **Forecast Data** | Those items of **Standard Planning Data** and **Detailed Planning Data** which will always be forecast. |
| **Frequency** | The number of alternating current cycles per second (expressed in Hertz) at which a **System** is running. |
| **Frequency Containment Reserves (FCR)** | means, in the context of **Balancing Services**, the **Active Power** reserves available to contain **System Frequency** after the occurrence of an imbalance. |
| **Frequency Response Deadband** | An interval used intentionally to make the **Frequency** control unresponsive.<br>In the case of mechanical governor systems, the **Frequency Response Deadband** is the same as **Frequency Response Insensitivity**. |
| **Frequency Response Insensitivity** | The inherent feature of the control system specified as the minimum magnitude of change in the **Frequency** or input signal that results in a change of output power or output signal. |
| **Frequency Restoration Reserves (FRR)** | Means, in the context of **Balancing Services**, the **Active Power** reserves available to restore **System Frequency** to the nominal **Frequency**. |
| **Frequency Sensitive AGR Unit** | Each **Generating Unit** in an **Existing AGR Plant** for which the **Generator** has notified **The Company** that it has a safety case agreed with the Nuclear Installations Inspectorate enabling it to operate in **Frequency Sensitive Mode**, to the extent that such unit is within its **Frequency Sensitive AGR Unit Limit**. Each such **Generating Unit** shall be treated as if it were operating in accordance with BC3.5.1 provided that it is complying with its **Frequency Sensitive AGR Unit Limit**. |

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| **Frequency Sensitive AGR Unit Limit** | In respect of each **Frequency Sensitive AGR Unit**, 8 (or such lower number which when added to the number of instances of flexibility for the purposes of assisting in a period of low **System** or **Localised NRAPM** totals 8) instances of reduction of output in any calendar year as instructed by **The Company** in relation to operation in **Frequency Sensitive Mode** (or such greater number as may be agreed between **The Company** and the **Generator**), for the purpose of assisting with **Frequency** control, provided the level of operation of each **Frequency Sensitive AGR Unit** in **Frequency Sensitive Mode** shall not be outside that agreed by the Nuclear Installations Inspectorate in the relevant safety case. |
| **Frequency Sensitive Mode** | A **Genset**, or **Type C Power Generating Module** or **Type D Power Generating Module** or **DC Connected Power Park Module** or **HVDC System** operating mode which will result in **Active Power** output changing, in response to a change in **System Frequency**, in a direction which assists in the recovery to **Target Frequency**, by operating so as to provide **Primary Response** and/or **Secondary Response** and/or **High Frequency Response**. |
| **Fuel Security Code** | The document of that title designated as such by the **Secretary of State**, as from time to time amended. |
| **Gas System Planner Licence or GSP Licence** | Means a licence granted or treated as granted under section 7AA(1) of the **Gas Act 1986.** |
| **Gas Turbine Unit** | A **Generating Unit** driven by a gas turbine (for instance by an aero-engine). |
| **Gas Zone Diagram** | A single line diagram showing boundaries of, and interfaces between, gas-insulated **HV Apparatus** modules which comprise part, or the whole, of a substation at a **Connection Site** (or in the case of **OTSDUW Plant and Apparatus**, **Transmission Interface Site**), together with the associated stop valves and gas monitors required for the safe operation of the **National Electricity Transmission System** or the **User System**, as the case may be. |
| **Gate Closure** | Has the meaning set out in the **BSC**. |

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| **GB Code User** | A **User** in respect of:-<br>(a) A **Generator** or **OTSDUA** whose **Main Plant and Apparatus** (excluding a **DC Connected Power Park Module**) is connected to the **System** before 27 April 2019, or who had concluded **Purchase Contracts** for its **Main Plant and Apparatus** before 17 May 2018, or whose **Plant and Apparatus** is not the subject of a **Substantial Modification** which is effective on or after 27 April 2019; or<br>(b) A **DC Converter Station** owner whose **Main Plant and Apparatus** is connected to the **System** before 8 September 2019, or who had concluded **Purchase Contracts** for its **Main Plant and Apparatus** before 28 September 2018, or whose **Plant and Apparatus** is not the subject of a **Substantial Modification** which is effective on or after 8 September 2019; or<br>(c) A **Non-Embedded Customer** whose **Main Plant and Apparatus** was connected to the **National Electricity Transmission System** at a **GB Grid Supply Point** before 18 August 2019 or who had placed **Purchase Contracts** for its **Main Plant and Apparatus** before 7 September 2018 or that **Non-Embedded Customer** is not the subject of a **Substantial Modification** which is effective on or after 18 August 2019; or<br>(d) A **Network Operator** whose entire distribution **System** was connected to the **National Electricity Transmission System** at one or more **GB Grid Supply Points** before 18 August 2019 or who had placed **Purchase Contracts** for its **Main Plant and Apparatus** in respect of its entire distribution **System** before 7 September 2018 or its entire distribution **System** is not the subject of a **Substantial Modification** which is effective on or after 18 August 2019. For the avoidance of doubt, a **Network Operator** would still be classed as a **GB Code User** where its entire distribution **System** was connected to the **National Electricity Transmission System** at one or more **GB Grid Supply Points**, even where that entire distribution **System** may have one or more **EU Grid Supply Points** but still comprises of **GB Grid Supply Points**. |
| **GB Generator** | A **Generator,** or **OTSDUA**, who is also a **GB Code User**. |
| **GB Generator Final-Balancing Compliance Notification** | A notification from **The Company** to a **GB Generator** in respect of an **Embedded Small Power Station** with a **Bilateral Embedded Generation Agreement** with **The Company**, with a **Completion Date** on or after 05-09-2024, confirming that the **GB Generator** has demonstrated compliance with:<br>(a) the relevant sections of the Grid Code as applicable, and<br>(b) the **Bilateral Embedded Generation Agreement**,<br>and that all the items in the schedule of **Unresolved Issues** have been completed to **The Company**'s satisfaction. |

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| **GB Generator Interim-Balancing Compliance Notification** | A notification from **The Company** to a **GB Generator** in respect of an **Embedded Small Power Station** with a **Bilateral Embedded Generation Agreement** with **The Company**, with a **Completion Date** on or after 05-09-2024, acknowledging that the **GB Generator** has demonstrated compliance, except for the **Unresolved Issues**, with:<br>(a) the relevant sections of the Grid Code as applicable, and<br>(b) the **Bilateral Embedded Generation Agreement**. |
| **GBGF Fast Fault Current Injection** | The ability of a **Grid Forming Plant** to supply reactive current, that starts to be delivered into the **Total System** in less than 5ms when the voltage falls below 90% of its nominal value at the **Grid Entry Point** or **User System Entry Point**. |
| **GB Grid Forming - Inverter** or **GBGF-I** | Is any **Power Park Module**, **HVDC System**, **DC Converter**, **OTSDUW Plant and Apparatus**, **Non-Synchronous Electricity Storage Module**, **Dynamic Reactive Compensation Equipment** or any **Plant** and **Apparatus** (including a smart load) which is connected or partly connected to the **Total System** via an **Electronic Power Converter** which has a **Grid Forming Capability (GBGF-I)**. |
| **GB Grid Forming – Synchronous** or **GBGF-S** | Is a **Synchronous Power Generating Module**, **Synchronous Electricity Storage Module** or **Synchronous Generating Unit** with a **Grid Forming Capability**. |
| **GB Grid Supply Point** | A **Grid Supply Point** which is not an **EU Grid Supply Point**. |
| **GB Synchronous Area** | The AC power **System** in **Great Britain** which connects **User's**, **Relevant Transmission Licensee's** whose AC **Plant** and **Apparatus** is considered to operate in synchronism with each other at each **Connection Point** or **User System Entry Point** and at the same **System Frequency**. |
| **GCDF** | Means the Grid Code Development Forum. |
| **General Conditions** or **GC** | That portion of the Grid Code which is identified as the **General Conditions**. |
| **Generating Plant Demand Margin** | The difference between **Output Usable** and forecast **Demand**. |
| **Generating Unit** | An **Onshore Generating Unit** and/or an **Offshore Generating Unit** which could also be part of a **Power Generating Module**. |

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| **Generating Unit Data** | The **Physical Notification**, **Export and Import Limits** and **Other Relevant Data** only in respect of each **Generating Unit** (which could be part of a **Power Generating Module**):<br>(a) which forms part of the **BM Unit** which represents that **Cascade Hydro Scheme**;<br>(b) at an **Embedded Exemptable Large Power Station**, where the relevant **Bilateral Agreement** specifies that compliance with **BC1** and/or **BC2** is required:<br>(i) to each **Generating Unit**, or<br>(ii) to each **Power Park Module** where the **Power Station** comprises **Power Park Modules**. |
| **Generation Capacity** | Has the meaning set out in the **BSC**. |
| **Generation Planning Parameters** | Those parameters listed in Appendix 2 of **OC2**. |
| **Generator** | A person who generates electricity or undertakes **Electricity Storage** under licence or exemption under the **Act**, acting in its capacity as a generator in **Great Britain** or **Offshore**. The term **Generator** includes a **EU Generator** and a **GB Generator**. |
| **Generator Performance Chart** | A diagram which shows the MW and MVAr capability limits within which a **Generating Unit** will be expected to operate under steady state conditions. |
| **Genset** | A **Power Generating Module** (including a **DC Connected Power Park Module** and/or **Electricity Storage Module**), **Generating Unit**, **Power Park Module** or **CCGT Module** at a **Large Power Station** or any **Power Generating Module** (including a **DC Connected Power Park Module**), **Generating Unit**, **Power Park Module** or **CCGT Module** which is directly connected to the **National Electricity Transmission System**. |
| **Good Industry Practice** | The exercise of that degree of skill, diligence, prudence and foresight which would reasonably and ordinarily be expected from a skilled and experienced operator engaged in the same type of undertaking under the same or similar circumstances. |
| **Governance Rules** or **GR** | That portion of the **Grid Code** which is identified as the **Governance Rules**. |
| **Governor Deadband** | An interval used intentionally to make the **frequency** control unresponsive. |
| **Great Britain** or **GB** | The landmass of England and Wales and Scotland, including internal waters. |
| **Grid Code Fast Track Proposals** | A proposal to modify the **Grid Code** which is raised pursuant to GR.26 and has not yet been approved or rejected by the **Grid Code Review Panel**. |
| **Grid Code Modification Fast Track Report** | A report prepared pursuant to GR.26 |

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| **Grid Code Modification Register** | Has the meaning given in GR.13.1. |
| **Grid Code Modification Report** | Has the meaning given in GR.22.1. |
| **Grid Code Modification Procedures** | The procedures for the modification of the **Grid Code** (including the implementation of **Approved Modifications**) as set out in the **Governance Rules**. |
| **Grid Code Modification Proposal** | A proposal to modify the **Grid Code** which is not yet rejected pursuant to GR.15.5 or GR.15.6 and has not yet been implemented. |
| **Grid Code Modification Self- Governance Report** | Has the meaning given in GR.24.5 |
| **Grid Code Objectives** | Means the objectives referred to in condition E3.2(b) of the **ESO Licence**. |
| **Grid Code Review Panel** or **Panel** | The panel with the functions set out in GR.1.2. |
| **Grid Code Review Panel Recommendation Vote** | The vote of **Panel Members** undertaken by the **Panel Chairperson** in accordance with Paragraph GR.22.4 as to whether in their view they believe each proposed **Grid Code Modification Proposal**, or **Workgroup Alternative Grid Code Modification** would better facilitate achievement of the **Grid Code Objective(s)** and so should be made. |
| **Grid Code Review Panel Self-Governance Vote** | The vote of **Panel Members** undertaken by the **Panel Chairperson** in accordance with GR.24.9 as to whether they believe each proposed Grid Code Modification Proposal, as compared with the then existing provisions of the **Grid Code** and any **Workgroup Alternative Grid Code Modification** set out in the **Grid Code Modification Self-Governance Report**, would better facilitate achievement of the **Grid Code Objective(s)**. |
| **Grid Code Self-Governance Proposals** | **Grid Code Modification Proposals** which satisfy the **Self Governance Criteria**. |
| **Grid Entry Point** | An **Onshore Grid Entry Point** or an **Offshore Grid Entry Point**. |
| **Grid Forming Active Power** | **Grid Forming Active Power** is the inherent **Active Power** produced by **Grid Forming Plant** that includes **Active Inertia Power** plus **Active Phase Jump Power** plus **Active Damping Power**. |

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| **Grid Forming Capability** | Is (but not limited to) the capability a **Power Generating Module**, **HVDC Converter** (which could form part of an **HVDC System**), **Generating Unit**, **Power Park Module**, **DC Converter**, **OTSDUW Plant** and **Apparatus**, **Electricity Storage Module**, **Dynamic Reactive Compensation Equipment** or any **Plant** and **Apparatus** (including a smart load) whose supplied **Active Power** is directly proportional to the difference between the magnitude and phase of its **Internal Voltage Source** and the magnitude and phase of the voltage at the **Grid Entry Point** or **User System Entry Point** and the sine of the **Load Angle**. As a consequence, **Plant** and **Apparatus** which has a **Grid Forming Capability** has a frequency of rotation of the **Internal Voltage Source** which is the same as the **System Frequency** for normal operation, with only the **Load Angle** defining the relative position between the two. In the case of a **GBGF-I**, a **Grid Forming Unit** forming part of a **GBGF-I** shall be capable of sustaining a voltage at its terminals irrespective of the voltage at the **Grid Entry Point** or **User System Entry Point** for normal operating conditions.<br><br>For **GBGF-I**, the control system, which determines the amplitude and phase of the **Internal Voltage Source**, shall have a response to the voltage and **System Frequency** at the **Grid Entry Point** or **User System Entry Point**) with a bandwidth that is less than a defined value as shown by the control system's **NFP** Plot. Exceptions to this requirement are only allowed during transients caused by **System** faults, voltage dips/surges and/or step or ramp changes in the phase angle which are large enough to cause damage to the **Grid Forming Plant** via excessive currents. |
| **Grid Forming Electronic Power Converter** | A **Grid Forming Plant** whose output is derived from an **Electronic Power Converter** with a **GBGF-I** capability. |
| **Grid Forming Plant** | A site which contains **Plant and Apparatus** which is classified as either a **GBGF-S** or a **GBGF-I** |
| **Grid Forming Plant Owner** | The owner or operator of a **Grid Forming Plant**. |
| **Grid Forming Unit** | A **Power Park Unit** or **Electricity Storage Unit** or a **Synchronous Power Generating Unit** or individual **Load** with a **Grid Forming Capability**. |
| **Grid Oscillation Value** | An injected test frequency signal applied at nominal **System Frequency** with a superimposed oscillatory response overlayed onto the nominal **System Frequency** with an amplitude of 0.05 Hz peak to peak at a frequency of 1 Hz and is used for determining the rating of the **Defined Active Damping Power**. |
| **Grid Supply Point** | A point of supply from the **National Electricity Transmission System** to **Network Operators** or **Non-Embedded Customers** which could be a **GB Grid Supply Point** or an **EU Grid Supply Point**. |
| **Group** | Those **National Electricity Transmission System** sub-stations bounded solely by the faulted circuit(s) and the overloaded circuit(s) excluding any third party connections between the **Group** and the rest of the **National Electricity Transmission System**, the faulted circuit(s) being a **Secured Event**. |
| **GSP Group** | Has the meaning as set out in the **BSC**. |

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| **Headroom** | The **Power Available** (in MW) less the actual **Active Power** exported from the **Power Park Module** (in MW). |
| **High Frequency Response** | An automatic reduction in **Active Power** output in response to an increase in **System Frequency** above the **Target Frequency** (or such other level of **Frequency** as may have been agreed in an **Ancillary Services Agreement**). This reduction in **Active Power** output must be in accordance with the provisions of the relevant **Ancillary Services Agreement** which will provide that it will be released increasingly with time over the period 0 to 10 seconds from the time of the **Frequency** increase on the basis set out in the **Ancillary Services Agreement** and fully achieved within 10 seconds of the time of the start of the **Frequency** increase and it must be sustained at no lesser reduction thereafter. The interpretation of the **High Frequency Response** to a + 0.5 Hz frequency change is shown diagrammatically in Figure CC.A.3.3 and Figure ECC.A.3.3. |
| **High Voltage** or **HV** | For **E&W Transmission Systems**, a voltage exceeding 650 volts. For **Scottish Transmission Systems**, a voltage exceeding 1000 volts. |
| **Historic Frequency Data** | **System Frequency** data at a maximum of one second intervals for the whole month, published by **The Company** as detailed in OC3.4.4. |
| **Houseload Operation** | Operation which ensures that a **Power Station** is able to continue to supply its in-house load in the event of **System** faults resulting in **Power-Generating Modules** being disconnected from the **System** and tripped onto their auxiliary supplies |
| **HP Turbine Power Fraction** | Ratio of steady state mechanical power delivered by the HP turbine to the total steady state mechanical power delivered by the total steam turbine at **Registered Capacity** or **Maximum Capacity**. |
| **HV Connections** | **Apparatus** connected at the same voltage as that of the **National Electricity Transmission System**, including **Users'** circuits, the higher voltage windings of **Users'** transformers and associated connection **Apparatus**. |
| **HVDC Converter** | Any **EU Code User Apparatus** used to convert alternating current electricity to direct current electricity, or vice versa. An **HVDC Converte**r is a standalone operative configuration at a single site comprising one or more converter bridges, together with one or more converter transformers, reactors, converter control equipment, essential protective and switching devices and auxiliaries, if any, used for conversion. In a bipolar arrangement, an **HVDC Converter** represents the bipolar configuration. |
| **HVDC Converter Station** | Part of an **HVDC System** which consists of one or more **HVDC Converters** installed in a single location together with buildings, reactors, filters reactive power devices, control, monitoring, protective, measuring and auxiliary equipment. |
| **HVDC Equipment** | Collectively means an **HVDC System** and a **DC Connected Power Park Module** and a **Remote End HVDC Converter Station**. |
| **HVDC Interface Point** | A point at which **HVDC Plant** and **Apparatus** is connected to an AC **System** at which technical specifications affecting the performance of the **Plant** and **Apparatus** can be prescribed. |
| **HVDC System** | An electrical power system which transfers energy in the form of high voltage direct current between two or more alternating current (AC) buses and comprises at least two **HVDC Converter Stations** with DC **Transmission** lines or cables between the **HVDC Converter Stations**. |

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| **HVDC System Owner** | A party who owns and is responsible for an **HVDC System**. For the avoidance of doubt a **DC Connected Power Park Module** owner would be treated as a **Generator**. |
| **IEC** | International Electrotechnical Commission. |
| **IEC Standard** | A standard approved by the International Electrotechnical Commission. |
| **Implementation Date** | Is the date and time for implementation of an **Approved Modification** as specified in accordance with Paragraph GR.25.3. |
| **Implementing Safety Co-ordinator** | The **Safety Co-ordinator** implementing **Safety Precautions**. |
| **Import Usable** | That portion of **Registered Import Capacity** which is expected to be available and which is not unavailable due to a **Planned Outage**. |
| **Incident Centre** | A centre established by **The Company** or a **User** as the focal point in **The Company** or in that **User**, as the case may be, for the communication and dissemination of information between the senior management representatives of **The Company**, or of that **User**, as the case may be, and the relevant other parties during a **Joint System Incident** in order to avoid overloading **The Company's**, or that **User's**, as the case may be, existing operational/control arrangements. |
| **Independent Back-Up Protection** | A **Back-Up Protection** system which utilises a discrete relay, different current transformers and an alternate operating principle to the **Main Protection** systems(s) such that it can operate autonomously in the event of a failure of the **Main Protection**. |
| **Independent Main Protection** | A **Main Protection** system which utilises a physically discrete relay and different current transformers to any other **Main Protection**. |
| **Indicated Constraint Boundary Margin** | The difference between a constraint boundary transfer limit and the difference between the sum of **BM Unit** Maximum Export Limits and the forecast of local **Demand** within the constraint boundary. |
| **Indicated Imbalance** | The difference between the sum of **Physical Notifications** for **BM Units** comprising **Generating Units** or **CCGT Modules** or **Power Generating Modules** and the forecast of **Demand** for the whole or any part of the **System**. |
| **Indicated Margin** | The difference between the sum of **BM Unit** Maximum Export Limits submitted and the forecast of **Demand** for the whole or any part of the **System**. |
| **Inertia Constant H** | For a **GBGF-S** the **Inertia Constant H** is measured in MWsec/MVA. |
| **Inertia Constant He** | For a **GBGF- I Electronic Power Converter** the **Inertia Constant He**, is measured in MWsec/MVA and produced by the **Active ROCOF Response Power**. |
| **Information Request Notice** | A notice that will be issued by **The Company** to a relevant party setting out **The Company's** reasonable requirements for relevant information in accordance with section 172 of the Energy Act 2023. This will be prepared in accordance with **The Company's** published **Information Request Statement.** |

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| **Information Request Statement** | A statement prepared and published by **The Company**, in accordance with section 172 of the Energy Act 2023 and condition D2.5 of the **ESO Licence** and **GSP Licence**, setting out the process that **The Company** will follow when requesting information from relevant parties by the issue of an **Information Request Notice.** |
| **Installation Document** | A simple structured document containing information about a **Type A Power Generating Module** or a **Demand Unit**, with demand response connected below 1000 V, and confirming its compliance with the relevant requirements |
| **Instructor Facilities** | A device or system which gives certain **Transmission Control Centre** instructions with an audible or visible alarm, and incorporates the means to return message acknowledgements to the **Transmission Control Centre**. |
| **Integral Equipment Test** or **IET** | A test on equipment, associated with **Plant** and/or **Apparatus**, which takes place when that **Plant** and/or **Apparatus** forms part of a **Synchronised System** and which, in the reasonable judgement of the person wishing to perform the test, may cause an **Operational Effect**. |
| **Intellectual Property" or "IPRs** | Patents, trade marks, service marks, rights in designs, trade names, copyrights and topography rights (whether or not any of the same are registered and including applications for registration of any of the same) and rights under licences and consents in relation to any of the same and all rights or forms of protection of a similar nature or having equivalent or similar effect to any of the same which may subsist anywhere in the world. |
| **Interconnector** | as defined in the **BSC** |
| **Interconnection Agreement** | An agreement made between **The Company** and an **Externally Interconnected System Operator** and/or an **Interconnector User** and/or other relevant persons for the **External Interconnection** relating to an **External Interconnection** and/or an agreement under which an **Interconnector User** can use an **External Interconnection**. |
| **Interconnector Export Capacity** | In relation to an **External Interconnection** means the (daily or weekly) forecast value (in MW) at the time of the (daily or weekly) peak demand, of the maximum level at which the **External Interconnection** can export to the **Grid Entry Point**. |
| **Interconnector Import Capacity** | In relation to an **External Interconnection** means the (daily or weekly) forecast value (in MW) at the time of the (daily or weekly) peak demand of the maximum level at which the **External Interconnection** can import from the **Grid Entry Point**. |
| **Interconnector Owner** | Has the meaning given to the term in the **Connection and Use of System Code**. |
| **Interconnector Reference Programme** | Has the meaning given to that term in section BC1.A.3. |
| **Interconnector User** | Has the meaning set out in the **BSC**. |
| **Interface Agreement** | Has the meaning set out in the **CUSC**. |

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| **Interface Point** | As the context admits or requires either;<br>(a) the electrical point of connection between an **Offshore Transmission System** and an **Onshore Transmission System**, or<br>(b) the electrical point of connection between an **Offshore Transmission System** and a **Network Operator's User System**. |
| **Interface Point Capacity** | The maximum amount of **Active Power** transferable at the **Interface Point** as declared by a **User** under the **OTSDUW Arrangements** expressed in whole MW. |
| **Interface Point Target Voltage/Power factor** | The nominal target voltage/power factor at an **Interface Point** which a **Network Operator** requires **The Company** to achieve by operation of the relevant **Offshore Transmission System**. |
| **Interim-Balancing Compliance Notification** | A notification from **The Company** to an **EU Generator** in respect of an **Embedded Small Power Station** with a **Bilateral Embedded Generation Agreement** with **The Company**, with a **Completion Date** on or after 05-09-2024**,** acknowledging that the **Generator** has demonstrated compliance, except for the **Unresolved Issues**, with:<br>(a) **Engineering Recommendation** G99 as required by the relevant **Network Operator**,<br>(b) The relevant sections of the Grid Code and **Bilateral Embedded Generation Agreement**. |
| **Interim Operational Notification** or **ION** | A notification from **The Company** to a **Generator** or **DC Converter Station** owner or **HVDC System Owner** or **Network Operator** or **Non-Embedded Customer** acknowledging that the **User** has demonstrated compliance, except for the **Unresolved Issues**;<br>(a) with the Grid Code, and<br>(b) where applicable, with Appendices F1 to F5 of the **Bilateral Agreement**,<br>in each case in respect of the **Plant** and **Apparatus** (including **OTSUA**) specified in such notification and provided that in the case of the **OTSDUW Arrangements** such notification shall be provided to a **Generator** in two parts dealing with the **OTSUA** and **Generator's Plant** and **Apparatus** (called respectively "**Interim Operational Notification Part A**" or "**ION A**" and "**Interim Operational Notification Part B**" or "**ION B"**) as provided for in the **CP** or **ECP**. |
| **Intermittent Power Source** | The primary source of power for a **Generating Unit** or **Power Generating Module** that cannot be considered as controllable, e.g. wind, wave or solar. For the avoidance of doubt, the output from an **Electricity Storage Module** would not be considered to be an **Intermittent Power Source**. |

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| **Internal Voltage Source** or **IVS** | For a **GBGF-S**, a real magnetic field, that rotates synchronously with the **System Frequency** under normal operating conditions, which as a consequence induces an internal voltage (which is often referred to as the Electro Motive Force (EMF)) in the stationary generator winding that has a real impedance.<br><br>In a **GBGF-I**, switched power electronic devices are used to produce a voltage waveform, with harmonics, that has a fundamental rotational component called the **Internal Voltage Source (IVS)** that rotates synchronously with the **System Frequency** under normal operating conditions.<br><br>For a **GBGF-I** there must be an impedance between the **Internal Voltage Source** and the **Grid Entry Point** or **User System Entry Point**.<br><br>For the avoidance of doubt, the impedance between the **Internal Voltage Source** and the **Grid Entry Point** or **User System Entry Point** could be virtual, real, or a combination of the two. |
| **Intertripping** | (a) The tripping of circuit-breaker(s) by commands initiated from **Protection** at a remote location independent of the state of the local **Protection**; or<br><br>(b) **Operational Intertripping**. |
| **Intertrip Apparatus** | **Apparatus** which performs **Intertripping**. |
| **IP Completion Day** | 31 December 2020 as defined in Section 39 of the European Union (Withdrawal Agreement) Act 2020. |
| **IP Turbine Power Fraction** | Ratio of steady state mechanical power delivered by the IP turbine to the total steady state mechanical power delivered by the total steam turbine at **Registered Capacity** or **Maximum Capacity**. |
| **Isolating Device** | A device for achieving **Isolation**. |

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| **Isolation** | The disconnection of **HV Apparatus** (as defined in OC8A.1.6.2 and OC8B.1.7.2) from the remainder of the **System** in which that **HV Apparatus** is situated by either of the following:<br>(a) an **Isolating Device** maintained in an isolating position. The isolating position must either be:<br>(i) maintained by immobilising and **Locking** the **Isolating Device** in the isolating position and affixing a **Caution Notice** to it. Where the **Isolating Device** is **Locked** with a **Safety Key**, the **Safety Key** must be secured in a **Key Safe** and the **Key Safe Key** must be, where reasonably practicable, given to the authorised site representative of the **Requesting Safety Co-Ordinator** and is to be retained in safe custody. Where not reasonably practicable the **Key Safe Key** must be retained by the authorised site representative of the **Implementing Safety Co-ordinator** in safe custody; or<br>(ii) maintained and/or secured by such other method which must be in accordance with the **Local Safety Instructions** or the **Safety Rules** of the **Relevant Transmission Licensee** or that **User**, as the case may be; or<br>(b) an adequate physical separation which must be in accordance with and maintained by the method set out in the **Local Safety Instructions** or the **Safety Rules** of the **Relevant Transmission Licensee** or that **User**, as the case may be. |
| **ISOP** | Independent System Operator and Planner, means a person designated by the Secretary of State under section 162 of the Energy Act 2023 as the holder of the **ESO Licence**, and the **GSP Licence**. For the time being that person is the **NESO.** |
| **Joint System Incident** | An **Event** wherever occurring (other than on an **Embedded Medium Power Station** or an **Embedded Small Power Station**) which, in the opinion of **The Company** or a **User**, has or may have a serious and/or widespread effect, in the case of an **Event** on a **User(s) System(s)** (other than on an **Embedded Medium Power Station** or **Embedded Small Power Station**), on the **National Electricity Transmission System**, and in the case of an **Event** on the **National Electricity Transmission System**, on a **User(s) System(s)** (other than on an **Embedded Medium Power Station** or **Embedded Small Power Station**). |
| **Key Safe** | A device for the secure retention of keys. |
| **Key Safe Key** | A key unique at a **Location** capable of operating a lock, other than a control lock, on a **Key Safe**. |

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| **Large Power Station** | A **Power Station** which is<br>(a) directly connected to:<br>(i) **NGET's Transmission System** where such **Power Station** has a **Registered Capacity** of 100MW or more; or<br>(ii) **SPT's Transmission System** where such **Power Station** has a **Registered Capacity** of 30MW or more; or<br>(iii) **SHETL's Transmission System** where such **Power Station** has a **Registered Capacity** of 10MW or more; or<br>(iv) an **Offshore Transmission System** where such **Power Station** has a **Registered Capacity** of 10MW or more;<br>or,<br>(b) **Embedded** within a **User System** (or part thereof) where such **User System** (or part thereof) is connected under normal operating conditions to:<br>(i) **NGET's Transmission System** and such **Power Station** has a **Registered Capacity** of 100MW or more; or<br>(ii) **SPT's Transmission System** and such **Power Station** has a **Registered Capacity** of 30MW or more; or<br>(iii) **SHETL's Transmission System** and such **Power Station** has a **Registered Capacity** of 10MW or more;<br>or,<br>(c) **Embedded** within a **User System** (or part thereof) where the **User System** (or part thereof) is not connected to the **National Electricity Transmission System**, although such **Power Station** is in:<br>(i) **NGET's Transmission Area** where such **Power Station** has a **Registered Capacity** of 100MW or more; or<br>(ii) **SPT's Transmission Area** where such **Power Station** has a **Registered Capacity** of 30MW or more; or<br>(iii) **SHETL's Transmission Area** where such **Power Station** has a **Registered Capacity** of 10MW or more;<br>For the avoidance of doubt, a **Large Power Station** could comprise of **Type A**, **Type B**, **Type C** or **Type D Power Generating Modules**. |
| **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 a decision that is not, or so much of a decision as is not, **Assimilated Law**. |
| **Legal Challenge** | Where permitted by law, a judicial review in respect of the **Authority's** decision to approve or not to approve a **Grid Code Modification Proposal**. |
| **Licence** | Any licence granted to **The Company** or a **Relevant Transmission Licensee** or a **User**, under Section 6 of the **Act**. |

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| **Licence Standards** | Those standards set out or referred to in condition E7 of **The Company's ESO Licence** and/or condition D3 and/or condition E16 of a **Relevant Transmission Licensee's Transmission Licence**. |
| **Limited-Balancing Compliance Notification** | A notification from **The Company** to an **EU Generator** in respect of an **Embedded Small Power Station** with a **Bilateral Embedded Generation Agreement** with **The Company**, with a **Completion Date** on or after 05-09-2024, stating that the **Generator's Plant** and/or **Apparatus** specified in such notification may be, or is, unable to comply:<br>(a) with the relevant provisions of the Grid Code and the **Bilateral Embedded Generation Agreement**; and/or<br>(b) in accordance with ECP.9.1 (ii) of the Grid Code, upon receipt of notification from the **Network Operator** concerning an **EU Generator** failing to meet the requirements of **Engineering Recommendation** G99 or any provisions of the Grid Code, or where applicable **Bilateral Agreement**. |
| **Limited Frequency Sensitive Mode** | A mode whereby the operation of the **Genset** or **Power Generating Module** (or **DC Converter** at a **DC Converter Station** or **HVDC Systems** exporting **Active Power** to the **Total System)** is **Frequency** insensitive except when the **System Frequency** exceeds 50.4Hz, from which point **Limited High Frequency Response** must be provided. For **Power Generating Modules** (including **DC Connected Power Park Modules**) and **HVDC Systems**, operation in **Limited Frequency Sensitive Mode** would require **Limited Frequency Sensitive Mode – Overfrequency (LFSM-O)** capability and **Limited Frequency Sensitive Mode – Underfrequency (LFSM-U)** capability. |
| **Limited Frequency Sensitive Mode – Overfrequency** or **LFSM-O** | A **Power Generating Module** (including a **DC Connected Power Park Module**) or **HVDC System** operating mode which will result in **Active Power** output reduction in response to a change in **System Frequency** above a certain value. |
| **Limited Frequency Sensitive Mode – Underfrequency** or **LFSM-U** | A **Power Generating Module** (including a **DC Connected Power Park Module**) or **HVDC System** operating mode which will result in **Active Power** output increase in response to a change in **System Frequency** below a certain value. |
| **Limited High Frequency Response** | A response of a **Genset** (or **DC Converter** at a **DC Converter Station** exporting **Active Power** to the **Total System)** to an increase in **System Frequency** above 50.4Hz leading to a reduction in **Active Power** in accordance with the provisions of BC3.7.2.1. |
| **Limited Membership Workgroup** | A **Workgroup** having less than five (5) but more than two (2) persons that have nominated themselves for membership in addition to the **Code Administrator** representative and the chairperson of the **Workgroup**.<br><br>Members of a **Limited Membership Workgroup** where employed by companies that are considered to be an **Affiliate** of each other will be considered to be a single workgroup member for the purposes of fulfilling this minimum requirement. |

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| **Limited Operational Notification** or **LON** | A notification from **The Company** to a **Generator** or **DC Converter Station** owner or **HVDC System Owner** or **Network Operator** or **Non-Embedded Customer** stating that the **User's Plant** and/or **Apparatus** specified in such notification may be, or is, unable to comply:<br>(a) with the provisions of the Grid Code specified in the notice, and<br>(b) where applicable, with Appendices F1 to F5 of the **Bilateral Agreement** ,<br>and specifying the **Unresolved Issues**. |
| **Load** | The **Active**, **Reactive** or **Apparent Power**, as the context requires, generated, transmitted or distributed. |
| **Loaded** | Supplying electrical power to the **System**. |
| **Load Angle** | The angle in radians between the voltage of the **Internal Voltage Source** and the voltage at the **Grid Entry Point** or **User System Entry Point**. |
| **Load Factor** | The ratio of the actual output of a **Generating Unit** or **Power Generating Module** to the possible maximum output of that **Generating Unit** or **Power Generating Module**. |
| **Load Management Block** | A block of **Demand** controlled by a **Supplier** or other party through the means of radio teleswitching or by some other means. |
| **Local Joint Restoration Plan** | A plan produced and agreed by **The Company**, **Transmission Licensee**, **Restoration Contractors** and a **Network Operator** under OC9.4.7.7, detailing the agreed method and procedure by which **The Company** or **Transmission Licensee** in Scotland will instruct a **Restoration Contractor** with an **Anchor Plant** to energise, part of the **Total System** within 2 hours of that instruction and subsequently meet complementary blocks of local **Demand** so as to form a **Power Island**. A **Local Joint Restoration Plan** may require the use of **Top Up Restoration Plant**.<br>A **Local Joint Restoration Plan** is distinct from and falls outside the provisions of a **Distribution Restoration Zone Plan**. |
| **Local Safety Instructions** | For safety co-ordination in England and Wales, instructions on each **User Site** and **Transmission Site**, approved by **NGET's**, the relevant **Competitively Appointed Transmission Licensee's** or **User's** relevant manager as relevant for the **User Site** location, setting down the methods of achieving the objectives of **NGET's** or the relevant **Competitively Appointed Transmission Licensee's** or the **User's Safety Rules**, as the case may be, to ensure the safety of personnel carrying out work or testing on **Plant** and/or **Apparatus** on which their **Safety Rules** apply and, in the case of a **User**, any other document(s) on a **User Site** which contains rules with regard to maintaining or securing the isolating position of an **Isolating Device**, or maintaining a physical separation or maintaining or securing the position of an **Earthing Device**. |
| **Local Switching Procedure** | A procedure produced under OC7.6 detailing the agreed arrangements in respect of carrying out of **Operational Switching** at **Connection Sites** and parts of the **National Electricity Transmission System** adjacent to those **Connection Sites**. |

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| **Localised Negative Reserve Active Power Margin** or **Localised NRAPM** | That margin of **Active Power** sufficient to allow transfers to and from a **System Constraint Group** (as the case may be) to be contained within such reasonable limit as **The Company** may determine. |
| **Location** | Any place at which **Safety Precautions** are to be applied. |
| **Locked** | A condition of **HV Apparatus** that cannot be altered without the operation of a locking device. |
| **Locking** | The application of a locking device which enables **HV Apparatus** to be **Locked**. |
| **London Court of International Arbitration** | The leading London-based arbitral institution and not-for-profit company limited by guarantee of that name with a registered company number of 0204767 providing for the resolution of commercial disputes in accordance with its arbitration rules. |
| **Low Frequency Relay** | Has the same meaning as **Under Frequency Relay**. |
| **Low Voltage** or **LV** | For **E&W Transmission Systems** a voltage not exceeding 250 volts. For **Scottish Transmission Systems**, a voltage exceeding 50 volts but not exceeding 1000 volts. |
| **LV Side of the Offshore Platform** | Unless otherwise specified in the **Bilateral Agreement**, the busbar on the **Offshore Platform** (typically 33kV) at which the relevant **Offshore Grid Entry Point** is located. |
| **Main Plant and Apparatus** | In respect of a **Power Station** (including **Power Stations** comprising of **DC Connected Power Park Modules** and **Electricity Storage Modules**) is one or more of the principal items of **Plant** or **Apparatus** required to convert or re-convert the primary source of energy into electricity.<br><br>In respect of **HVDC Systems** or **DC Converters** or **Transmission DC Converters** is one of the principal items of **Plant** or **Apparatus** used to convert high voltage direct current to high voltage alternating current or vice versa.<br><br>In respect of a **Network Operator's** equipment or a **Non-Embedded Customer's** equipment, is one of the principal items of **Plant** or **Apparatus** required to facilitate the import or export of **Active Power** or **Reactive Power** to or from a **Network Operator's** or **Non-Embedded Customer's System**. |
| **Main Protection** | A **Protection** system which has priority above other **Protection** in initiating either a fault clearance or an action to terminate an abnormal condition in a power system. |
| **Manufacturer's Data & Performance Report** | A report submitted by a manufacturer to **The Company** relating to a specific version of a **Power Park Unit** demonstrating the performance characteristics of such **Power Park Unit** in respect of which **The Company** has evaluated its relevance for the purposes of the **Compliance Processes**. |

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| **Manufacturer's Test Certificates** | A certificate prepared by a manufacturer which demonstrates that its **Power Generating Module** has undergone appropriate tests and conforms to the performance requirements expected by **The Company** in satisfying its compliance requirements and thereby satisfies the appropriate requirements of the Grid Code and **Bilateral Agreement**. |
| **Market Operation Data Interface System (MODIS)** | A computer system operated by **The Company** and made available for use by **Customers** connected to or using the **National Electricity Transmission System** for the purpose of submitting **EU Transparency Availability Data** to **The Company**. |
| **Market Suspension Threshold** | Has the meaning given to the term 'Market Suspension Threshold' in Section G of the **BSC**. |
| **Material Effect** | An effect causing **The Company** or a **Relevant Transmission Licensee** to effect any works or to alter the manner of operation of **Transmission Plant** and/or **Transmission Apparatus** at the **Connection Site** (which term shall, in this definition and in the definition of "**Modification**" only, have the meaning ascribed thereto in the **CUSC**) or the site of connection or a **User** to effect any works or to alter the manner of operation of its **Plant** and/or **Apparatus** at the **Connection Site** or the site of connection which in either case involves that party in expenditure of more than £10,000. |
| **Materially Affected Party** | Any person or class of persons designated by the **Authority** as such. |
| **Maximum Export Capability** | The maximum continuous **Active Power** that a **Network Operator** or **Non-Embedded Customer** can export to the **Transmission System** at the **Grid Supply Point**, as specified in the **Bilateral Agreement**. |
| **Maximum Export Capacity** | The maximum continuous **Apparent Power** expressed in MVA and maximum continuous **Active Power** expressed in MW which can flow from an **Offshore Transmission System** connected to a **Network Operator's User System**, to that **User System**. |
| **Maximum Capacity or $P_{max}$** | The maximum continuous **Active Power** which a **Power Generating Module** can supply to the **Total System**, less any demand associated solely with facilitating the operation of that **Power Generating Module** and not fed into the **System**. In the case of an **Electricity Storage Module**, the **Maximum Capacity** is the maximum continuous **Active Power** which an **Electricity Storage Module** can export to the **Total System** less any demand associated with facilitating the operation of that **Electricity Storage Module** when fully charged and operating in a mode analogous to **Generation**. |
| **Maximum Generation Service or MGS** | A service utilised by **The Company** in accordance with the **CUSC** and the **Balancing Principles Statement** in operating the **Total System**. |
| **Maximum Generation Service Agreement** | An agreement between a **User** and **The Company** for the payment by **The Company** to that **User** in respect of the provision by such **User** of a **Maximum Generation Service**. |
| **Maximum HVDC Active Power Transmission Capacity (PHmax)** | The maximum continuous **Active Power** which an **HVDC System** can exchange with the network at each **Grid Entry Point** or **User System Entry Point** as specified in the **Bilateral Agreement** or as agreed between **The Company** and the **HVDC System Owner**. |

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| **Maximum Import Capability** | The maximum continuous **Active Power** that a **Network Operator** or **Non-Embedded Customer** can import from the **Transmission System** at the **Grid Supply Point**, as specified in the **Bilateral Agreement**. |
| **Maximum Import Capacity** | The maximum continuous **Apparent Power** expressed in MVA and maximum continuous **Active Power** expressed in MW which can flow to an **Offshore Transmission System** connected to a **Network Operator's User System**, from that **User System**. |
| **Maximum Import Power** | The maximum continuous **Active Power** which an **Electricity Storage Module** can import from the **Total System**, when fully discharged and operating in a mode analogous to **Demand**. |
| **Medium Power Station** | A **Power Station** which is<br>(a) directly connected to **NGET's Transmission System** where such **Power Station** has a **Registered Capacity** of 50MW or more but less than 100MW;<br>or,<br>(b) **Embedded** within a **User System** (or part thereof) where such **User System** (or part thereof) is connected under normal operating conditions to **NGET's Transmission System** and such **Power Station** has a **Registered Capacity** of 50MW or more but less than 100MW;<br>or,<br>(c) **Embedded** within a **User System** (or part thereof) where the **User System** (or part thereof) is not connected to the **National Electricity Transmission System**, although such **Power Station** is in **NGET's Transmission Area** and such **Power Station** has a **Registered Capacity** of 50MW or more but less than 100MW.<br>For the avoidance of doubt a **Medium Power Station** could comprise of **Type A**, **Type B**, **Type C** or **Type D Power Generating Modules**. |
| **Medium Voltage** or **MV** | For **E&W Transmission Systems** a voltage exceeding 250 volts but not exceeding 650 volts. |
| **Mills** | Milling plant which supplies pulverised fuel to the boiler of a coal fired **Power Station**. |
| **Minimum Generation** | The minimum output (in whole MW) which a **Genset** can generate or **DC Converter** at a **DC Converter Station** or **Electricity Storage Module** can import or export to the **Total System** under stable operating conditions, as registered with **The Company** under the **PC** (and amended pursuant to the **PC**). For the avoidance of doubt, the output may go below this level as a result of operation in accordance with BC3.7. |
| **Minimum Active Power Transmission Capacity (PHmin)** | The minimum continuous **Active Power** which an **HVDC System** can exchange with the **System** at each **Grid Entry Point** or **User System Entry Point** as specified in the **Bilateral Agreement** or as agreed between **The Company** and the **HVDC System Owner**. |

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| **Minimum Import Capacity** | The minimum input (in whole MW) into a **DC Converter** at a **DC Converter Station** or **HVDC System** at an **HVDC Converter** (in any of its operating configurations) at the **Onshore Grid Entry Point** (or in the case of an **Embedded DC Converter** or an **Embedded HVDC Converter** at the **User System Entry Point**) at which a **DC Converter** or **HVDC Converter** can operate in a stable manner, as registered with **The Company** under the **PC** (and amended pursuant to the **PC**). |
| **Minimum Regulating Level** | The minimum **Active Power**, as specified in the **Bilateral Agreement** or as agreed between **The Company** and the **Generator** or **HVDC System Owner**, down to which the **Power Generating Module** (including a **DC Connected Power Park Module**) or **HVDC System** can control **Active Power**. |
| **Minimum Stable Operating Level** | The minimum **Active Power**, as specified in the **Bilateral Agreement** or as agreed between **The Company** and the **Generator**, at which the **Power Generating Module** can be operated stably for an unlimited time. |
| **Minister of the Crown** | As defined in the **ESO Licence.** |
| **Modification** | Any actual or proposed replacement, renovation, modification, alteration or construction by or on behalf of a **User** or **The Company** to either that **User's Plant** or **Apparatus** or **Transmission Plant** or **Apparatus**, as the case may be, or the manner of its operation which has or may have a **Material Effect** on **The Company** or a **User**, as the case may be, at a particular **Connection Site**. |
| **Mothballed DC Connected Power Park Module** | A **DC Connected Power Park Module** that has previously generated which the **Generator** plans not to use to generate for the remainder of the current **Financial Year** but which could be returned to service. |
| **Mothballed DC Converter at a DC Converter Station** | A **DC Converter** at a **DC Converter Station** that has previously imported or exported power which the **DC Converter Station Owner** plans not to use to import or export power for the remainder of the current **Financial Year** but which could be returned to service. |
| **Mothballed HVDC System** | An **HVDC System** that has previously imported or exported power which the **HVDC System Owner** plans not to use to import or export power for the remainder of the current **Financial Year** but which could be returned to service. |
| **Mothballed HVDC Converter** | An **HVDC Converter** which is part of an **HVDC System** that has previously imported or exported power which the **HVDC System Owner** plans not to use to import or export power for the remainder of the current **Financial Year** but which could be returned to service. |
| **Mothballed Generating Unit** | A **Generating Unit** that has previously generated which the **Generator** plans not to use to generate for the remainder of the current **Financial Year** but which could be returned to service. For the avoidance of doubt a **Mothballed Generating Unit** could be part of a **Power Generating Module**. |
| **Mothballed Power Generating Module** | A **Power Generating Module** that has previously generated which the **Generator** plans not to use to generate for the remainder of the current **Financial Year** but which could be returned to service. |

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| **Mothballed Power Park Module** | A **Power Park Module** that has previously generated which the **Generator** plans not to use to generate for the remainder of the current **Financial Year** but which could be returned to service. |
| **Multiple Point of Connection** | A double (or more) **Point of Connection**, being two (or more) **Points of Connection** interconnected to each other through the **User's System**. |
| **MSID** | Has the meaning a set out in the **BSC**, covers Metering System Identifier. |
| **National Demand** | The amount of electricity supplied from the **Grid Supply Points** plus:-<br>• that supplied by **Embedded Large Power Stations**, and<br>• **National Electricity Transmission System Losses**,<br>minus:-<br>• the **Demand** taken by **Station Transformers** and, **Pumped Storage Units'** and **Electricity Storage Modules'**.<br>and, for the purposes of this definition, does not include:-<br>• any exports from the **National Electricity Transmission System** across **External Interconnections**. |
| **National Electricity Transmission System** | The **Onshore Transmission System** and, where owned by **Offshore Transmission Licensees**, **Offshore Transmission Systems**. |
| **National Electricity Transmission System Demand** | The amount of electricity supplied from the **Grid Supply Points** plus:-<br>• that supplied by **Embedded Large Power Stations**, and<br>• exports from the **National Electricity Transmission System** across **External Interconnections**, and<br>• **National Electricity Transmission System Losses**,<br>and, for the purposes of this definition, includes:-<br>• the **Demand** taken by **Station Transformers** and, **Pumped Storage Units** and **Electricity Storage Modules'.** |
| **National Electricity Transmission System Losses** | The losses of electricity incurred on the **National Electricity Transmission System**. |
| **National Electricity Transmission System Operator Area** | Means the area by that name as set out in the terms of the **ESO Licence.** |
| **National Electricity Transmission System Study Network Data File** | A computer file produced by **The Company** which in **The Company's** view provides an appropriate representation of the **National Electricity Transmission System** for a specific point in time. The computer file will contain information and data on **Demand** on the **National Electricity Transmission System** and on **Large Power Stations** including **Genset** power output consistent with **Output Usable** and **The Company's** view of prevailing system conditions. |

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| **National Electricity Transmission System Warning** | A warning issued by **The Company** to **Users** (or to certain **Users** only) in accordance with OC7.4.8.2, which provides information relating to **System** conditions or **Events** and is intended to:<br>(a) alert **Users** to possible or actual **Plant** shortage, **System** problems and/or **Demand** reductions;<br>(b) inform of the applicable period;<br>(c) indicate intended consequences for **Users**; and<br>(d) enable specified **Users** to be in a state of readiness to receive instructions from **The Company**. |
| **National Electricity Transmission System Warning - Demand Control Imminent** | A warning issued by **The Company**, in accordance with OC7.4.8.7, which is intended to provide short term notice, where possible, to those **Users** who are likely to receive **Demand** reduction instructions from **The Company** within 30 minutes. |
| **National Electricity Transmission System Warning - Electricity Margin Notice** | A warning issued by **The Company**, in accordance with OC7.4.8.5, which is intended to invite a response from and to alert recipients to a decreased **System Margin**. |
| **National Electricity Transmission System Warning – Embedded Generation Control Imminent** | A warning issued by **The Company**, in accordance with OC7.4.8.12, which is intended to provide short term notice, where possible, to those **Network Operators** who are likely to receive **Embedded Generation Control** instructions from **The Company** within 30 minutes. |
| **National Electricity Transmission System Warning - High Risk of Demand Reduction** | A warning issued by **The Company**, in accordance with OC7.4.8.6, which is intended to alert recipients that there is a high risk of **Demand** reduction being implemented and which may normally result from an **Electricity Margin Notice**. |
| **National Electricity Transmission System Warning - High Risk of Embedded Generation Reduction** | A warning issued by **The Company**, in accordance with OC7.4.8.11, which is intended to alert recipients that there is a high risk of **Embedded Generation Control** being implemented and which may result from a **National Electricity Transmission System Warning – System NRAPM.** |
| **National Electricity Transmission System Warning – Localised NRAPM** | A warning issued by **The Company**, in accordance with OC.7.4.8.10, which is intended to invite a response from and to alert recipients to a decreased **Localised NRAPM**. |
| **National Electricity Transmission System Warning - Risk of System Disturbance** | A warning issued by **The Company**, in accordance with OC7.4.8.8, which is intended to alert **Users** of the risk of widespread and serious **System** disturbance which may affect **Users**. |
| **National Electricity Transmission System Warning – System NRAPM** | A warning issued by **The Company**, in accordance with OC.7.4.8.9, which is intended to invite a response from and to alert recipients to a decreased **System NRAPM**. |
| **National Energy System Operator or NESO** | The company with registered number 11014226, as the designated **ISOP** and holder of the **ESO Licence** and the **GSP Licence.** |

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| **Network Data** | The data to be provided by **The Company** to **Users** in accordance with the **PC**, as listed in Part 3 of the Appendix to the **PC**. |
| **Network Frequency Perturbation Plot** | A form of Bode Plot which plots the amplitude (%) and phase (degrees) of the resulting output oscillation responding to an applied input oscillation across a frequency base. The plot will be used to assess the capability and performance of a **Grid Forming Plant** and to ensure that it does not pose a risk to other **Plant** and **Apparatus** connected to the **Total System**.<br><br>For **GBGF-I**, these are used to provide data to **The Company** which together with the associated **Nichols Chart** (or equivalent) defines the effects on a **GBGF-I** for changes in the frequency of the applied input oscillation.<br><br>The input is the applied as an input oscillation and the output is the resulting oscillations in the **GBGF-I's Active Power**.<br><br>For the avoidance of doubt, **Generators** in respect of **GBGF-S** can provide their data using the existing formats and do not need to supply **NFP** plots. |
| **Network Gas Supply Emergency** | Has the meaning set out in the **BSC**. |
| **Network Operator** | A person with a **User System** directly connected to the **National Electricity Transmission System** to which **Customers** and/or **Power Stations** (not forming part of the **User System**) are connected, acting in its capacity as an operator of the **User System**, but shall not include a person acting in the capacity of an **Externally Interconnected System Operator** or a **Generator** in respect of **OTSUA**. |
| **NGET** | National Grid Electricity Transmission plc (NO: 2366977) whose registered office is at 1-3 Strand, London, WC2N 5EH. |
| **Nichols Chart** | For a **GBGF-I**, a chart derived from the open loop Bode Plots that are used to produce an **NFP Plot**. The **Nichols Chart** plots open loop gain versus open loop phase angle. This enables the open loop phase for an open loop gain of 1 to be identified for use in defining the **GBGF-I**'s equivalent **Damping Factor**. |
| **No-Load Field Voltage** | Shall have the meaning ascribed to that term in **IEC** 34-16-1:1991 [equivalent to **British Standard BS**4999 Section 116.1 : 1992]. |
| **No System Connection** | As defined in OC8A.1.6.2 and OC8B.1.7.2. |
| **Non-CUSC Party** | A Party who does not accede to the **Connection and Use of System Code** (**CUSC**). |
| **Non-Synchronous Electricity Storage Module** | A **Power Park Module** comprising soley of one or more **Non-Synchronous Electricity Storage Units**. |
| **Notification of User's Intention to Operate** | A notification from a **Network Operator** or **Non-Embedded Customer** to **The Company** informing **The Company** of the date upon which any **Network Operator's** or **Non-Embedded Customer's Plant** and **Apparatus** at an **EU Grid Supply Point** will be ready to be connected to the **Transmission System**. |

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| **Notification of User's Intention to Synchronise** | A notification from a **Generator** or **DC Converter Station** owner or **HVDC System Owner** to **The Company** informing **The Company** of the date upon which any **OTSUA**, a **Generating Unit**(s), **CCGT Module**(s), **Power Park Module**(s), **Power Generating Module**(s) (including a **DC Connected Power Park Module**(s)), **HVDC System** or **DC Converter**(s) will be ready to be **Synchronised** to the **Total System**. |
| **Non-Controllable Electricity Storage Equipment** | An item of storage **Plant**, including but not limited to a **Synchronous Flywheel** or **Synchronous Compensation Equipment** or **Regenerative Braking** whose active output power cannot be independently controlled. |
| **Non-Dynamic Frequency Response Service** | A **Demand Response Service** in which the **Demand** is controlled through discrete switching rather than through continuous load changes in response to **System Frequency** changes. |
| **Non-Embedded Customer** | A **Customer** in **Great Britain**, except for a **Network Operator** acting in its capacity as such, receiving electricity direct from the **Onshore Transmission System** irrespective of from whom it is supplied. |
| **Non-Synchronous Electricity Storage Module** | A **Power Park Module** comprising solely of one or more **Non-Synchronous Electricity Storage Units**. |
| **Non-Synchronous Electricity Storage Unit** | A **Power Park Unit** which can produce electrical energy by converting or re-converting another source of energy such that the frequency of the generated voltage is not inherently in synchronism with the frequency of the **System**. |
| **Non-Synchronous Generating Unit** | An **Onshore Non-Synchronous Generating Unit** or **Offshore Non-Synchronous Generating Unit** which could form part of a **Power Generating Module**. |
| **Normal CCGT Module** | A **CCGT Module** other than a **Range CCGT Module**. |
| **Novel Unit** | A tidal, wave, wind, geothermal, or any similar, **Generating Unit**. |
| **OC9 De-synchronised Island Procedure** | Has the meaning set out in OC9.5.4. |
| **Offshore** | Means wholly or partly in **Offshore Waters**, and when used in conjunction with another term and not defined means that the associated term is to be read accordingly. |
| **Offshore DC Converter** | Any **User Apparatus** located **Offshore** used to convert alternating current electricity to direct current electricity, or vice versa. An **Offshore 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. |
| **Offshore HVDC Converter** | Any **User Apparatus** located **Offshore** used to convert alternating current electricity to direct current electricity, or vice versa. An **Offshore HVDC 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. |

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| **Offshore Development Information Statement** | A statement prepared by **The Company** . |
| **Offshore Generating Unit** | Unless otherwise provided in the Grid Code, any **Apparatus** located **Offshore** which produces electrical energy by converting or re-converting another source of energy, including, an **Offshore Synchronous Generating Unit** or **Offshore Non-Synchronous Generating Unit** which could also be part of a **Power Generating Module** or **Electricity Storage Module** |
| **Offshore Grid Entry Point** | In the case of:-<br>(a) an **Offshore Generating Unit** or an **Offshore Synchronous Power Generating Module** or an **Offshore DC Converter** or an **Offshore HVDC Converter**, as the case may be, which is directly connected to an **Offshore Transmission System**, the point at which it connects to that **Offshore Transmission System**, or;<br>(b) an **Offshore Power Park Module** which is directly connected to an **Offshore Transmission System**, the point where one **Power Park String** (registered by itself as a **Power Park Module**) or the collection of points where a number of **Offshore Power Park Strings** (registered as a single **Power Park Module**) connects to that **Offshore Transmission System**, or;<br>(c) an **External Interconnection** which is directly connected to an **Offshore Transmission System**, the point at which it connects to that **Offshore Transmission System**. |
| **Offshore Local Joint Restoration Plan** | A plan produced and agreed by **The Company**, **Offshore Transmission Licensees**, **Restoration Contractors**, a **Network Operator** and in some cases an **Onshore Transmission Licensee** under OC9.4.7.7, detailing the agreed method and procedure by which **The Company** will instruct a **Restoration Contractor** with an **Anchor Plant** located **Offshore** to energise, part of the **Total System** (including but not limited to parts of the **Offshore Transmission System**) within 2 hours of that instruction and subsequently meet complementary blocks of local **Demand** so as to form a **Power Island**. An **Offshore Local Joint Restoration Plan** may require the use of **Top Up Restoration Plant**.<br><br>An **Offshore Local Joint Restoration Plan** is distinct from and falls outside the provisions of a **Distribution Restoration Zone Plan** |
| **Offshore Non-Synchronous Generating Unit** | An **Offshore Generating Unit** that is not an **Offshore Synchronous Generating Unit** including for the avoidance of doubt a **Power Park Unit** or **Non-Synchronous Electricity Storage Unit** located **Offshore**. |
| **Offshore Platform** | A single structure comprising of **Plant** and **Apparatus** located **Offshore** which includes one or more **Offshore Grid Entry Points**. |

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| **Offshore Power Park Module** | A collection of one or more **Offshore Power Park Strings** (registered as a **Power Park Module** under the **PC**). There is no limit to the number of **Power Park Strings** within the **Power Park Module**, so long as they either:<br>(a) connect to the same busbar which cannot be electrically split; or<br>(b) connect to a collection of directly electrically connected busbars of the same nominal voltage and are configured in accordance with the operating arrangements set out in the relevant **Bilateral Agreement**. |
| **Offshore Power Park String** | A collection of **Offshore Generating Units** or **Power Park Units** or **Non-Synchronous Electricity Storage Unit** that are powered by an **Intermittent Power Source**, joined together by cables forming part of a **User System** with a single point of connection to an **Offshore Transmission System**. The connection to an **Offshore Transmission System** may include a **DC Converter** or **HVDC Converter**. |
| **Offshore Synchronous Generating Unit** | A **Generating Unit** or **Synchronous Electricity Storage Unit** located **Offshore** which could be part of an **Offshore Synchronous Power Generating Module** in which, under all steady state conditions, the rotor rotates at a mechanical speed equal to the electrical frequency of the **National Electricity Transmission System** divided by the number of pole pairs of the **Generating Unit**. |
| **Offshore Synchronous Power Generating Module** | A **Synchronous Power Generating Module** or **Synchronous Electricity Storage Module** located **Offshore**. |
| **Offshore Tender Process** | The process followed by the **Authority** to make, in prescribed cases, a determination on a competitive basis of the person to whom an offshore transmission licence is to be granted. |
| **Offshore Transmission Distribution Connection Agreement** | An agreement entered into by **The Company** and a **Network Operator** in respect of the connection to and use of a **Network Operator's User System** by an **Offshore Transmission System**. |
| **Offshore Transmission Licensee** | Such person in relation to whose **Transmission Licence** the standard conditions in Section E (offshore transmission owner standard conditions) of such **Transmission Licence** have been given effect, or any person in that prospective role who has acceded to the **STC**. |
| **Offshore Transmission System** | A system consisting (wholly or mainly) of high voltage electric lines and used for the transmission of electricity from one **Power Station** to a sub-station or to another **Power Station** or between sub-stations, and includes any **Plant** and **Apparatus** (including **OTSUA**) and meters in connection with the transmission of electricity but does not include any **Remote Transmission Assets**. An **Offshore Transmission System** extends from the **Interface Point**, or the **Offshore Grid Entry Point(s)** and may include **Plant** and **Apparatus** located **Onshore** and **Offshore** and, where the context permits, references to the **Offshore Transmission System** includes **OTSUA**. |

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| **Offshore Transmission System Development User Works** or **OTSDUW** | In relation to a particular **User** where the **OTSDUW Arrangements** apply, means those activities and/or works for the design, planning, consenting and/or construction and installation of the **Offshore Transmission System** to be undertaken by the **User** as identified in Part 2 of Appendix I of the relevant **Construction Agreement**. |
| **Offshore Transmission System User Assets** or **OTSUA** | **OTSDUW Plant and Apparatus** constructed and/or installed by a **User** under the **OTSDUW Arrangements** which form an **Offshore Transmission System** that once transferred to a **Relevant Transmission Licensee** under an **Offshore Tender Process** will become part of the **National Electricity Transmission System**. |
| **Offshore Waters** | Has the meaning given to "offshore waters" in Section 90(9) of the Energy Act 2004. |
| **Offshore Works Assumptions** | In relation to a particular **User**, means those assumptions set out in Appendix P of the relevant **Construction Agreement** as amended from time to time. |
| **Onshore** | Means within **Great Britain**, and when used in conjunction with another term and not defined means that the associated term is to be read accordingly. |
| **Onshore DC Converter** | Any **User Apparatus** located **Onshore** with a **Completion Date** after 1st April 2005 used to convert alternating current electricity to direct current electricity, or vice versa. An **Onshore 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, an **Onshore DC Converter** represents the bipolar configuration. |
| **Onshore Generating Unit** | Unless otherwise provided in the Grid Code, any **Apparatus** located **Onshore** which produces electrical energy by converting or re-converting another source of energy, including, an **Onshore Synchronous Generating Unit** or **Onshore Non-Synchronous Generating Unit** which could also be part of a **Power Generating Module** or an **Electricity Storage Module**. |
| **Onshore Grid Entry Point** | A point at which a **Onshore Generating Unit** or a **CCGT Module** or a **CCGT Unit** or an **Onshore Power Generating Module** or a **Onshore DC Converter** or an **Onshore HVDC Converter** or a **Onshore Power Park Module** or an **Onshore Electricity Storage Module** or an **External Interconnection**, as the case may be, which is directly connected to the **Onshore Transmission System** connects to the **Onshore Transmission System**. |
| **Onshore HVDC Converter** | Any **User Apparatus** located **Onshore** used to convert alternating current electricity to direct current electricity, or vice versa. An **Onshore HVDC 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, an **Onshore HVDC Converter** represents the bipolar configuration. |

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| **Onshore Non-Synchronous Generating Unit** | A **Generating Unit** located **Onshore** that is not a **Synchronous Generating Unit** or **Synchronous Electricity Storage Unit** including for the avoidance of doubt a **Power Park Unit** or **Non-Synchronous Electricity Storage Unit** located **Onshore**. |
| **Onshore Power Park Module** | A collection of **Non-Synchronous Generating Units** that are powered by an **Intermittent Power Source** or connected through power electronic conversion technology or **Non-Synchronous Electricity Storage Units**, joined together by a **System** (registered as a **Power Park Module** under the **PC**) with a single electrical point of connection directly to the **Onshore Transmission System** (or **User System** if **Embedded**) with no intermediate **Offshore Transmission System** connections. The connection to the **Onshore Transmission System** (or **User System** if **Embedded**) may include a **DC Converter** or **HVDC Converter**. |
| **Onshore Synchronous Generating Unit** | An **Onshore Generating Unit** or **Onshore Synchronous Electricity Storage Unit** (which could also be part of an **Onshore Power Generating Module**) including, for the avoidance of doubt, a **CCGT Unit** or **Synchronous Electricity Storage Unit** in which, under all steady state conditions, the rotor rotates at a mechanical speed equal to the electrical frequency of the **National Electricity Transmission System** divided by the number of pole pairs of the **Generating Unit**. |
| **Onshore Synchronous Power Generating Module** | A **Synchronous Power Generating Module** or **Synchronous Electricity Storage Module** located **Onshore**. |
| **Onshore Transmission Licensee** | **NGET**, **SPT**, **SHETL**, or a **Competitively Appointed Transmission Licensee**. |
| **Onshore Transmission System** | The system consisting (wholly or mainly) of high voltage electric lines owned or operated by **Onshore Transmission Licensees** or operated by **The Company** and used for the transmission of electricity from one **Power Station** to a substation or to another **Power Station** or between substations or to or from **Offshore Transmission Systems** or to or from any **External Interconnection**, and includes any **Plant** and **Apparatus** and meters owned or operated by any **Onshore Transmission Licensee** in connection with the transmission of electricity but does not include any **Remote Transmission Assets**. |
| **On-Site Generator Site** | A site which is determined by the **BSC Panel** to be a Trading Unit under the **BSC** by reason of having fulfilled the Class 1 or Class 2 requirements as such terms are used in the **BSC**. |
| **Operating Code** or **OC** | That portion of the Grid Code which is identified as the **Operating Code**. |
| **Operating Margin** | **Contingency Reserve** plus **Operating Reserve**. |
| **Operating Reserve** | The additional output from **Large Power Stations** or the reduction in **Demand**, which must be realisable in real-time operation to respond in order to contribute to containing and correcting any **System Frequency** fall to an acceptable level in the event of a loss of generation or a loss of import from an **External Interconnection** or mismatch between generation and **Demand**. |
| **Operation** | A scheduled or planned action relating to the operation of a **System** (including an **Embedded Power Station**). |

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| **Operational Data** | Data required under the **Operating Codes** and/or **Balancing Codes**. |
| **Operational Day** | The period from 0500 hours on one day to 0500 on the following day. |
| **Operation Diagrams** | Diagrams which are a schematic representation of the **HV Apparatus** and the connections to all external circuits at a **Connection Site** (and in the case of **OTSDUW**, **Transmission Interface Site**), incorporating its numbering, nomenclature and labelling. |
| **Operational Effect** | Any effect on the operation of the relevant other **System** which causes the **National Electricity Transmission 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 to the way in which they would or may have operated in the absence of that effect. |
| **Operational Intertripping** | The automatic tripping of circuit-breakers to prevent abnormal system conditions occurring, such as over voltage, overload, **System** instability, etc. after the tripping of other circuit-breakers following power **System** fault(s) which includes **System** to **Generating Unit**, **System** to **CCGT Module**, **System** to **Power Park Module**, **System** to **Electricity Storage Module**, **System** to **DC Converter**, **System to Power Generating Module**, **System** to **HVDC Converter** and **System** to **Demand** intertripping schemes. |
| **Operational Notifications** | Any **Energisation Operational Notification**, **Interim Operational Notification**, **Final Operational Notification** or **Limited Operational Notification** issued from **The Company** to a **User**. |
| **Operational Planning** | Planning through various timescales the matching of generation output with forecast **National Electricity Transmission System Demand** together with a reserve of generation to provide a margin, taking into account outages of certain **Generating Units** or **Power Generating Modules**, of parts of the **National Electricity Transmission System** and of parts of **User Systems** to which **Power Stations** and/or **Customers** are connected, carried out to achieve, so far as possible, the standards of security set out in the **ESO Licence**, each **Relevant Transmission Licensee's Transmission Licence** or **Electricity Distribution Licence**, as the case may be. |
| **Operational Planning Margin** | An operational planning margin set by **The Company**. |
| **Operational Planning Phase** | The period from 8 weeks to the end of the 5th year ahead of real time operation. |
| **Operational Procedures** | Management instructions and procedures, both in support of the **Safety Rules** and for the local and remote operation of **Plant** and **Apparatus**, issued in connection with the actual operation of **Plant** and/or **Apparatus** at or from a **Connection Site**. |
| **Operational Switching** | Operation of **Plant** and/or **Apparatus** to the instruction of the relevant **Control Engineer**. For the avoidance of doubt, the operation of **Transmission Plant** and/or **Apparatus** forming part of the **National Electricity Transmission System** will be to the instruction of the **Relevant Transmission Licensee**. |

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| **Other Relevant Data** | The data listed in BC1.4.2(f) under the heading **Other Relevant Data**. |
| **OTSDUW Arrangements** | The arrangements whereby certain aspects of the design, consenting, construction, installation and/or commissioning of transmission assets are capable of being undertaken by a **User** prior to the transfer of those assets to a **Relevant Transmission Licensee** under an **Offshore Tender Process**. |
| **OTSDUW Data and Information** | The data and information to be provided by **Users** undertaking **OTSDUW**, to **The Company** in accordance with Appendix F of the **Planning Code**. |
| **OTSDUW DC Converter** | A **Transmission DC Converter** designed and/or constructed and/or installed by a **User** under the **OTSDUW Arrangements** and/or operated by the **User** until the **OTSUA Transfer Time**. |
| **OTSDUW Development and Data Timetable** | The timetable for both the delivery of **OTSDUW Data and Information** and **OTSDUW Network Data and Information** as referred to in Appendix F of the **Planning Code** and the development of the scope of the **OTSDUW**. |
| **OTSDUW Network Data and Information** | The data and information to be provided by **The Company** to **Users** undertaking **OTSDUW** in accordance with Appendix F of the **Planning Code**. |
| **OTSDUW Plant and Apparatus** | **Plant** and **Apparatus**, including any **OTSDUW DC Converter**, designed by the **User** under the **OTSDUW Arrangements**. |
| **OTSUA Transfer Time** | The time and date at which the **OTSUA** are transferred to a **Relevant Transmission Licensee**. |
| **Out of Synchronism** | The condition where a **System** or **Generating Unit** or **Power Generating Module** cannot meet the requirements to enable it to be **Synchronised**. |
| **Output Usable** or **OU** | The forecast value (in MW), profiled across the time period affected by the unplanned or planned Event of the level at which the **Genset** can export to the **Grid Entry Point**, or in the case of **Embedded Power Stations**, to the **User System Entry Point**. In addition, for a **Genset** powered by an **Intermittent Power Source** the forecast value is based upon the **Intermittent Power Source** being at a level which would enable the **Genset** to generate at **Registered Capacity**.<br><br>For the purpose of OC2 only, the term **Output Usable** shall include the terms **Interconnector Export Capacity** and **Interconnector Import Capacity** where the term **Output Usable** is being applied to an **External Interconnection**. |
| **Over-excitation Limiter** | Shall have the meaning ascribed to that term in **IEC** 34-16-1:1991 [equivalent to **British Standard BS**4999 Section 116.1: 1992]. |
| **Panel Chairperson** | A person appointed as such in accordance with GR.4.1. |
| **Panel Member** | Any of the persons identified as such in GR.4. |
| **Panel Members' Recommendation** | The recommendation in accordance with the "**Grid Code Review Panel Recommendation Vote**". |

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| **Panel Secretary** | A person appointed as such in accordance with GR.3.1.2(d). |
| **Part 1 System Ancillary Services** | **Ancillary Services** which are required for **System** reasons and which must be provided by **Users** in accordance with the **Connection Conditions** or **European Connection Conditions**. An exhaustive list of **Part 1 System Ancillary Services** is included in that part of CC.8.1 or ECC.8.1 headed Part 1. |
| **Part 2 System Ancillary Services** | **Ancillary Services** which are required for **System** reasons and which must be provided by a **User** if the **User** has agreed to provide them under a **Bilateral Agreement**. A non-exhaustive list of **Part 2 System Ancillary Services** is included in that part of CC.8.1 or ECC.8.1 headed Part 2. |
| **Part Load** | The condition of a **Genset**, or **Cascade Hydro Scheme** which is **Loaded** but is not running at its Maximum Export Limit. |
| **Peak Current Rating** | For a **GBGF-I** this is the larger of either the: -<br>• The registered maximum steady-state current plus the maximum additional current to supply the **Active ROCOF Response Power** plus the **Defined Active Damping Power**; or.<br>• The registered maximum steady-state current plus the maximum additional current to supply the **Phase Jump Angle** limit power, or.<br>This is the maximum short term total current as declared by the **Grid Forming Plant Owner** in accordance with PC.A.5.8.1. |
| **Permit for Work for proximity work** | In respect of **E&W Transmission Systems**, a document issued by the **Relevant E&W Transmission Licensee** or an **E&W User** in accordance with its respective **Safety Rules** to enable work to be carried out in accordance with OC8A.8 and which provides for **Safety Precautions** to be applied and maintained. An example format of a **Relevant E&W Transmission Licensee**'s permit for work is attached as Appendix E to **OC8A**.<br>In respect of **Scottish Transmission Systems**, a document issued by a **Relevant Scottish Transmission Licensee** or a **Scottish User** in accordance with its respective **Safety Rules** to enable work to be carried out in accordance with OC8B.8 and which provides for **Safety Precautions** to be applied and maintained. Example formats of **Relevant Scottish Transmission Licensees'** permits for work are attached as Appendix E to **OC8B**. |
| **Partial Shutdown** | The same as a **Total Shutdown** except that all generation has ceased in a separate part of the **Total System** and there is no electricity supply from **External Interconnections** or other parts of the **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 **The Company's** directions relating to **System Restoration**. |

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| **Pending Grid Code Modification Proposal** | A **Grid Code Modification Proposal** in respect of which, at the relevant time, the **Authority** has not yet made a decision as to whether to direct such **Grid Code Modification Proposal** to be made pursuant to the **ESO Licence** (whether or not a **Grid Code Modification Report** has been submitted in respect of such **Grid Code Modification Proposal**) or, in the case of a **Grid Code Self Governance Proposals**, in respect of which the **Grid Code Review Panel** has not yet voted whether or not to approve. |
| **Phase Jump Angle** | The difference in the measured phase angle of the voltage at the **Grid Entry Point** or **User System Entry Point** in a given mains half cycle compared with the measured phase angle of the voltage at the **Grid Entry Point** or **User System Entry Point** in the previous mains half cycle. |
| **Phase Jump Angle Limit** | The maximum **Phase Jump Angle** when applied to a **GBGF-I** which will result in a linear controlled response without activating current limiting functions. This is specified for a **System** angle near to zero which will be considered to be the normal operating angle under steady state conditions. |
| **Phase Jump Angle Withstand** | The maximum **Phase Jump Angle** change when applied to a **GBGF-I** which will result in the **GBGF-I** remaining in stable operation with current limiting functions activated. This is specified for a **System** angle near to zero which will be considered to be the normal operating angle under steady state conditions. |
| **Phase (Voltage) Unbalance** | The ratio (in percent) between the rms values of the negative sequence component and the positive sequence component of the voltage. |
| **Physical Notification** | Data that describes the **BM Participant**'s best estimate of the expected input or output of **Active Power** of a **BM Unit** and/or (where relevant) **Generating Unit**, except in the instance of a Stage 2 or higher **Network Gas Supply Emergency**, with the accuracy of the **Physical Notification** being commensurate with **Good Industry Practice**. |
| **Planning Code** or **PC** | That portion of the Grid Code which is identified as the **Planning Code**. |
| **Planned Maintenance Outage** | An outage of **The Company's** electronic data communication facilities as provided for in CC.6.5.8 or ECC.6.5.8 and **The Company's** associated computer facilities of which normally at least 5 days notice is given, but in any event of which at least twelve hours notice has been given by **The Company** to the **User** and which is anticipated to last no longer than 2 hours. The length of such an outage may in exceptional circumstances be extended where at least 24 hours notice has been given by **The Company** to the **User**. It is anticipated that normally any planned outage would only last around one hour. |
| **Planned Outage** | An outage of a **Large Power Station** or of part of the **National Electricity Transmission System**, or of part of a **User System**, co-ordinated by **The Company** under **OC2**. |
| **Plant** | Fixed and movable items used in the generation and/or supply and/or transmission of electricity, other than **Apparatus**. |

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| **Point of Common Coupling** | That point on the **National Electricity Transmission System** electrically nearest to the **User** installation at which either **Demands** or **Loads** are, or may be, connected. |
| **Point of Connection** | An electrical point of connection between the **National Electricity Transmission System** and a **User's System**. |
| **Point of Isolation** | The point on **Apparatus** (as defined in OC8A.1.6.2 and OC8B.1.7.2) at which **Isolation** is achieved. |
| **Post-Control Phase** | The period following real time operation. |
| **Power Available** | A signal prepared in accordance with good industry practice, representing the instantaneous sum of the potential **Active Power** available from each individual **Power Park Unit** within the **Power Park Module** calculated using any applicable combination of electrical or mechanical or meteorological data (including wind speed) measured at each **Power Park Unit** at a specified time. **Power Available** shall be a value between 0MW and **Registered Capacity** or **Maximum Capacity** which is the sum of the potential **Active Power** available of each **Power Park Unit** within the **Power Park Module.** A unit that is not generating or supplying power will be considered as not available. For the avoidance of doubt, the **Power Available** signal would be the **Active Power** output that a **Power Park Module** could reasonably be expected to export at the **Grid Entry Point** or **User System Entry Point** taking all the above criteria into account including **Power Park Unit** constraints such as optimisation modes but would exclude a reduction in the **Active Power** export of the **Power Park Module** instructed by **The Company** (for example) for the purposes selecting a **Power Park Module** to operate in **Frequency Sensitive Mode** or when an **Emergency Instruction** has been issued. |
| **Power Factor** | The ratio of **Active Power** to **Apparent Power**. |
| **Power-Generating Module** | Either a **Synchronous Power Generating Module**, a **Synchronous Electricity Storage Module**, a **Power Park Module** or a **Non-Synchronous Electricity Storage Module** owned or operated by an **EU Generator**. |
| **Power-Generating Module Document (PGMD)** | A document provided by the **Generator** to **The Company** for a **Type B** or **Type C Power Generating Module** which confirms that the **Power Generating Module's** compliance with the technical criteria set out in the Grid Code has been demonstrated and provides the necessary data and statements, including a statement of compliance. |
| **Power Generating Module Performance Chart** | A diagram showing the **Active Power** (MW) and **Reactive Power** (MVAr) capability limits within which a **Synchronous Power Generating Module** or **Power Park Module** at its **Grid Entry Point** or **User System Entry Point** will be expected to operate under steady state conditions. |
| **Power Island** | Part of the **Total System** which is disconnected from, and out of **Synchronism** with, the rest of the **Total System** containing **Generating Unit(s)** at one or more **Power Stations**, and/or **HVDC Systems** and/or **DC Converters**, together with complementary local **Demand**. |
| **Power Park Module** | Any **Onshore Power Park Module** or **Offshore Power Park Module**. |
| **Power Park Module Availability Matrix** | The matrix described in Appendix 1 to BC1 under the heading **Power Park Module Availability Matrix**. |

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| **Power Park Module Planning Matrix** | A matrix in the form set out in Appendix 4 of OC2 showing the combination of **Power Park Units** within a **Power Park Module** which would be expected to be running under normal conditions. |
| **Power Park Unit** | A **Generating Unit** within a **Power Park Module**. |
| **Power Station** | An installation comprising one or more **Generating Units** or **Power Park Modules** or **Power Generating Modules** or **Electricity Storage Modules** (even where sited separately) owned and/or controlled by the same **Generator**, which may reasonably be considered as being managed as one **Power Station**. |
| **Power System Stabiliser** or **PSS** | Equipment controlling the **Exciter** output via the voltage regulator in such a way that power oscillations of the synchronous machines are dampened. Input variables may be speed, frequency or power (or a combination of these). |
| **Preface** | The preface to the Grid Code (which does not form part of the Grid Code and therefore is not binding). |
| **Preliminary Notice** | A notice in writing, sent by **The Company** both to all **Users** identified by it under OC12.4.2.1 and to the **Test Proposer**, notifying them of a proposed **System Test**. |
| **Preliminary Project Planning Data** | Data relating to a proposed **User Development** at the time the **User** applies for a **CUSC Contract** but before an offer is made and accepted. |
| **Primary Response** | The automatic increase in **Active Power** output of a **Genset** or, as the case may be, the decrease in **Active Power Demand** in response to a **System Frequency** fall. This increase in **Active Power** output or, as the case may be, the decrease in **Active Power Demand** must be in accordance with the provisions of the relevant **Ancillary Services Agreement** which will provide that it will be released increasingly with time over the period 0 to 10 seconds from the time of the start of the **Frequency** fall on the basis set out in the **Ancillary Services Agreement** and fully available by the latter, and sustainable for at least a further 20 seconds. The interpretation of the **Primary Response** to a – 0.5 Hz frequency change is shown diagrammatically in Figure CC.A.3.2 and Figure ECC.A.3.2 |
| **Private Network** | A network which connects to a **Network Operator's System** and that network belongs to a **User** who is not classified as a **Generator**, **Network Operator** or **Non-Embedded Customer**. |
| **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. |
| **Proposal Notice** | A notice submitted to **The Company** by a **User** which would like to undertake a **System Test**. |

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| **Proposal Report** | A report submitted by the **Test Panel** which contains:<br>(a) proposals for carrying out a **System Test** (including the manner in which the **System Test** is to be monitored);<br>(b) an allocation of costs (including un-anticipated costs) between the affected parties (the general principle being that the **Test Proposer** will bear the costs); and<br>(c) such other matters as the **Test Panel** considers appropriate.<br>The report may include requirements for indemnities to be given in respect of claims and losses arising from a **System Test**. |
| **Proposed Implementation Date** | The proposed date(s) for the implementation of a **Grid Code Modification Proposal** or **Workgroup Alternative Grid Code Modification** such date(s) to be either (i) described by reference to a specified period after a direction from the Authority approving the **Grid Code Modification Proposal** or **Workgroup Alternative Grid Code Modification** or (ii) a **Fixed Proposed Implementation Date**. |
| **Proposer** | In relation to a particular **Grid Code Modification Proposal**, the person who makes such **Grid Code Modification Proposal**. |
| **Protection** | The provisions for detecting abnormal conditions on a **System** and initiating fault clearance or actuating signals or indications. |
| **Protection Apparatus** | A group of one or more **Protection** relays and/or logic elements designated to perform a specified **Protection** function. |
| **Pumped Storage** | A hydro unit in which water can be raised by means of pumps and stored to be used for the generation of electrical energy; |
| **Pumped Storage Generating Unit** | A **Generating Unit** at a **Pumped Storage Plant** |
| **Pumped Storage Generator** | A **Generator** which owns and/or operates any **Pumped Storage Plant**. |
| **Pumped Storage Plant** | A **Power Station** comprising **Pumped Storage Generating Units**. |
| **Pumped Storage Unit** | A **Generating Unit** within a **Pumped Storage Plant**. For the avoidance of doubt, a **Pumped Storage Unit** is not considered to form part of an **Electricity Storage Unit** unless specifically declared by the **Generator**. |
| **Purchase Contracts** | A final and binding contract for the purchase of the **Main Plant and Apparatus**. |
| **Q/Pmax** | The ratio of **Reactive Power** to the **Maximum Capacity**. The relationship between **Power Factor** and **Q/Pmax** is given by the formula:-<br>**Power Factor** = Cos $[\arctan[\frac{Q}{Pmax}]]$<br>For example, a **Power Park Module** with a Q/P value of +0.33 would equate to a **Power Factor** of Cos(arctan0.33) = 0.95 **Power Factor** lag. |

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| **Quick Resynchronisation Capability** | The capability of a **Type C** or **Type D Power Generating Module** as defined in ECC.6.3.5.6. For the avoidance of doubt this requirement is only mandatory for **EU Code Generators** who own or operate a **Type C** or **Type D Power Generating Module** but does not preclude owners of other generation electing to provide the capability. |
| **Quick Resynchronisation Unit Test** | A test undertaken on **Generating Unit** forming part of a **Type C** or **Type D Power Generating Module** as detailed in OC5.7.2.5 necessary to determine its ability to demonstrate a **Quick Resynchronisation Capability**. |
| **Range CCGT Module** | A **CCGT Module** where there is a physical connection by way of a steam or hot gas main between that **CCGT Module** and another **CCGT Module** or other **CCGT Modules**, which connection contributes (if open) to efficient modular operation, and which physical connection can be varied by the operator. |
| **Rated Field Voltage** | Shall have the meaning ascribed to that term in **IEC** 34-16-1:1991 [equivalent to **British Standard BS**4999 Section 116.1: 1992]. |
| **Rated MW** | The "rating-plate" MW output of a **Power Generating Module**, **Generating Unit**, **Power Park Module**, **Electricity Storage Module**, **HVDC Converter** or **DC Converter**, being:<br>(a) that output up to which the **Generating Unit** was designed to operate (Calculated as specified in **British Standard BS** EN 60034 – 1: 1995); or<br>(b) the nominal rating for the MW output of a **Power Park Module** or **Power Generating Module** being the maximum continuous electric output power which the **Power Park Module** or **Power Generating Module** was designed to achieve under normal operating conditions; or<br>(c) the nominal rating for the MW import capacity and export capacity (if at a **DC Converter Station** or **HVDC Converter Station**) of a **DC Converter** or **HVDC Converter**.<br>(d) in an importing mode, is that input up to which an **Electricity Storage Module** was designed to operate being the maximum continuous electric input which the **Electricity Storage Module** was designed to achieve under normal operating conditions. In an exporting mode is:-<br>(i) that output up to which the **Synchronous Electricity Storage Unit** was designed to operate (Calculated as specified in **British Standard BS** EN 60034 – 1: 1995); or<br>(ii) the nominal rating for the MW output of a **Non-Synchronous Electricity Storage Module** being the maximum continuous electric output power which the **Non-Synchronous Electricity Storage Module** was designed to achieve under normal operating conditions. |
| **Reactive Despatch Instruction** | Has the meaning set out in the **CUSC**. |

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| **Reactive Despatch Network Restriction** | A restriction placed upon an **Embedded Power Generating Module**, **Embedded Generating Unit**, **Embedded Power Park Module** or **DC Converter** at an **Embedded DC Converter Station** or **HVDC Converter** at an **Embedded HVDC Converter Station** by the **Network Operator** that prevents the **Generator** or **DC Converter Station** owner or **HVDC System Owner** in question (as applicable) from complying with any **Reactive Despatch Instruction** with respect to that **Power Generating Module**, **Generating Unit**, **Power Park Module** or **DC Converter** at a **DC Converter Station** or **HVDC Converter** at a **HVDC Converter Station**, whether to provide MVArs over the range referred to in CC 6.3.2, ECC.6.3.2 or otherwise. |
| **Reactive Despatch to Zero Mvar Network Restriction** | A **Reactive Despatch Network Restriction** which prevents an **Embedded Power Generating Module**, an **Embedded Generating Unit**, **Embedded Power Park Module**, **Embedded HVDC System**, **HVDC Converter** at an **Embedded HVDC Converter Station** or **DC Converter** at an **Embedded DC Converter Station** from supplying power at zero MVAr at all **Active Power** output levels up to and including **Rated MW** at the **Grid Entry Point** (or **User System Entry Point** if **Embedded**). |
| **Reactive Energy** | The integral with respect to time of the **Reactive Power**. |
| **Reactive Power** | The product of voltage and current and the sine of the phase angle between them measured in units of voltamperes reactive and standard multiples thereof, ie:<br>1000 VAr = 1 kVAr<br>1000 kVAr = 1 MVAr |
| **Record of Inter-System Safety Precautions** or **RISSP** | A written record of inter-system **Safety Precautions** to be compiled in accordance with the provisions of **OC8**. |
| **Regenerative Braking** | A method of braking in which energy is extracted from the parts braked, which may be returned directly to the **System** and the purpose of the braking is motion control. |

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| **Registered Capacity** | (a) In the case of a **Generating Unit** other than that forming part of a **CCGT Module** or **Power Park Module** or **Power Generating Module**, the normal full load capacity of a **Generating Unit** as declared by the **Generator**, less the MW consumed by the **Generating Unit** through the **Generating Unit's Unit Transformer** when producing the same (the resultant figure being expressed in whole MW, or in MW to one decimal place).<br><br>(b) In the case of a **CCGT Module** or **Power Park Module** owned or operated by a **GB Generator**, the normal full load capacity of the **CCGT Module** or **Power Park Module** (as the case may be) as declared by the **GB Generator**, being the **Active Power** declared by the **GB Generator** as being deliverable by the **CCGT Module** or **Power Park Module** at the **Grid Entry Point** (or in the case of an **Embedded CCGT Module** or **Power Park Module**, at the **User System Entry Point**), expressed in whole MW, or in MW to one decimal place. For the avoidance of doubt **Maximum Capacity** would apply to **Power Generating Modules** which form part of a **Large**, **Medium** or **Small Power Station**.<br><br>(c) In the case of a **Power Station**, the maximum amount of **Active Power** deliverable by the **Power Station** at the **Grid Entry Point** (or in the case of an **Embedded Power Station** at the **User System Entry Point**), as declared by the **Generator**, expressed in whole MW, or in MW to one decimal place. The maximum **Active Power** deliverable is the maximum amount deliverable simultaneously by the **Power Generating Modules** and/or **Generating Units** and/or **CCGT Modules** and/or **Power Park Modules** less the MW consumed by the **Power Generating Modules** and/or **Generating Units** and/or **CCGT Modules** in producing that **Active Power** and forming part of a **Power Station**.<br><br>(d) In the case of a **DC Converter** at a **DC Converter Station** or **HVDC Converter** at an **HVDC Converter Station**, the normal full load amount of **Active Power** transferable from a **DC Converter** or **HVDC Converter** at the **Onshore Grid Entry Point** (or in the case of an **Embedded DC Converter Station** or an **Embedded HVDC Converter Station** at the **User System Entry Point**), as declared by the **DC Converter Station** owner or **HVDC System Owner**, expressed in whole MW, or in MW to one decimal place.<br><br>(e) In the case of a **DC Converter Station** or **HVDC Converter Station**, the maximum amount of **Active Power** transferable from a **DC Converter Station** or **HVDC Converter Station** at the **Onshore Grid Entry Point** (or in the case of an **Embedded DC Converter Station** or **Embedded HVDC Converter Station** at the **User System Entry Point**), as declared by the **DC Converter Station** owner or **HVDC System Owner**, expressed in whole MW, or in MW to one decimal place.<br><br>(f) In the case of an **Electricity Storage Module**, the normal full load amount of **Active Power** transferable from an **Electricity Storage Module** at the **Grid Entry Point** (or in the case of an **Embedded Electricity Storage Module** at the **User System Entry Point**), as declared by the **Generator**, expressed in whole MW, or in MW to one decimal place. |

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| **Registered Data** | Those items of **Standard Planning Data** and **Detailed Planning Data** which upon connection become fixed (subject to any subsequent changes). |
| **Registered Import Capability** | In the case of a **DC Converter Station** or **HVDC Converter Station** containing **DC Converters** or **HVDC Converters** connected to an **External System**, the maximum amount of **Active Power** transferable into a **DC Converter Station** or **HVDC Converter Station** at the **Onshore Grid Entry Point** (or in the case of an **Embedded DC Converter Station** or **Embedded HVDC Converter Station** at the **User System Entry Point**), as declared by the **DC Converter Station** owner or **HVDC System Owner**, expressed in whole MW.<br><br>In the case of a **DC Converter** or **HVDC Converter** connected to an **External System** and in a **DC Converter Station** or **HVDC Converter Station**, the normal full load amount of **Active Power** transferable into a **DC Converter** or **HVDC Converter** at the **Onshore Grid Entry Point** (or in the case of an **Embedded DC Converter Station** or **Embedded HVDC Converter Station** at the **User System Entry Point**), as declared by the **DC Converter** owner or **HVDC System Owner**, expressed in whole MW.<br><br>In the case of an **Electricity Storage Module**, the maximum amount of **Active Power** transferable into an **Electricity Storage Module** at the **Grid Entry Point** (or in the case of an **Embedded Electricity Storage Module** at the **User System Entry Point**), as declared by the **Generator**, expressed in whole MW. |
| **Regulations** | The Utilities Contracts Regulations 1996, as amended from time to time. |
| **Regulated Sections** | Parts of the Grid Code that are referenced in **Governance Rules** Annex GR.B as amended from time to time with the approval of the **Authority**. |
| **Reheater Time Constant** | Determined at **Registered Capacity**, the reheater time constant will be construed in accordance with the principles of the IEEE Committee Report "Dynamic Models for Steam and Hydro Turbines in Power System Studies" published in 1973 which apply to such phrase. |
| **Rejected Grid Code Modification Proposal** | A **Grid Code Modification Proposal** in respect of which the **Authority** has decided not to direct **The Company** to modify the **Grid Code** pursuant to the **ESO Licence** in the manner set out herein or, in the case of a **Grid Code Self Governance Proposals**, in respect of which the **Grid Code Review Panel** has voted not to approve. |
| **Related Person** | Means, in relation to an individual, any member of their immediate family, their employer (and any former employer of theirs within the previous 12 months), any partner with whom they are in partnership, and any company or **Affiliate** of a company in which they or any member of their immediate family controls more than 20% of the voting rights in respect of the shares of the company; |
| **Relevant E&W Transmission Licensee** | As the context requires **NGET**, and/or a **Competitively Appointed Transmission Licensee** with **Plant** and **Apparatus** located in **NGET's Transmission Area** and/or an **E&W Offshore Transmission Licensee**. |
| **Relevant Party** | Has the meaning given in GR15.10(a). |

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| **Relevant Scottish Transmission Licensee** | As the context requires **SPT** and/or **SHETL**, and/or a **Competitively Appointed Transmission Licensee** with **Plant** and **Apparatus** located in either **SPT's** or **SHETL's Transmission Area** and/or a **Scottish Offshore Transmission Licensee**. |
| **Relevant Transmission Licensee** | Means National Grid Electricity Transmission plc (**NGET)** in its **Transmission Area** or SP Transmission plc (**SPT**) in its **Transmission Area** or Scottish Hydro-Electric Transmission Ltd (**SHETL**) in its **Transmission Area** or any **Offshore Transmission Licensee** in its **Transmission Area** or any **Competitively Appointed Transmission Licensee** with **Plant** and **Apparatus** located in **NGET's**, **SPT's** or **SHETL's Transmission Area** as appropriate. |
| **Relevant Unit** | As defined in the **STC**, Schedule 3. |
| **Remote End HVDC Converter Station** | An **HVDC Converter Station** which forms part of an **HVDC System** and is not directly connected to the AC part of the **GB Synchronous Area**. |
| **Remote Transmission Assets** | Any **Plant** and **Apparatus** or meters owned by **NGET** which:<br>(a) are **Embedded** in a **User System** and which are not directly connected by **Plant** and/or **Apparatus** owned by **NGET** to a sub-station owned by **NGET**; and<br>(b) are by agreement between **NGET** and such **User** operated under the direction and control of such **User**. |
| **Replacement Reserves (RR)** | Means, in the context of **Balancing Services,** the **Active Power** reserves available to restore or support the required level of FRR to be prepared for additional system imbalances, including generation reserves; |
| **Requesting Safety Co-ordinator** | The **Safety Co-ordinator** requesting **Safety Precautions**. |
| **Responsible Engineer/ Operator** | A person nominated by a **User** to be responsible for **System** control. |
| **Responsible Manager** | A manager who has been duly authorised by a **User** or a **Relevant Transmission Licensee** to sign **Site Responsibility Schedules** on behalf of that **User** or **Relevant Transmission Licensee** as the case may be. |
| **Restoration Contractor** | An **Anchor Restoration Contractor** or a **Top Up Restoration Contractor**. |
| **Restoration Plan** | Either a **Local Joint Restoration Plan**, a **Distribution Restoration Zone Plan** or an **Offshore Local Joint Restoration Plan** as the context requires. |
| **Restoration Service Provider** | A **User** or a party with a legal or contractual obligation to provide a service contributing to one or several measures of the **System Restoration Plan**. |
| **Restoration Service Test** | A test carried out on a **Plant** to confirm it has an **Anchor Plant Capablity** or **Top Up Restoration Capability**. |

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| **Re-synchronisation** | The bringing of parts of the **System** which have become **Out of Synchronism** with any other **System** back into **Synchronism**, and like terms shall be construed accordingly. |
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| **RR Acceptance** | The results of the **TERRE** auction for each **BM Participant**. |
| **Restricted** | Applies to a **TERRE Bid** which has been marked so that it will be passed to the **TERRE Central Platform** but will not be used in the auction. |
| **ROCOF** | **Rate of Change of Frequency** |
| **RR Instruction** | **Replacement Reserve** Instruction – used for instructing **BM Participants** after the results of the **TERRE** auction. An **RR Instruction** has the same format as a **Bid-Offer Acceptance** but has type field indicating it is for **TERRE**. |
| **Safety Co-ordinator** | A person or persons nominated by a **Relevant E&W Transmission Licensee** and each **E&W User** in relation to **Connection Points** (or in the case of **OTSUA** operational prior to the **OTSUA Transfer Time**, **Transmission Interface Points**) on an **E&W Transmission System** and/or by the **Relevant Scottish Transmission Licensee** and each **Scottish User** in relation to **Connection Points** (or in the case of **OTSUA** operational prior to the **OTSUA Transfer Time**, **Transmission Interface Points**) on a **Scottish Transmission System** to be responsible for the co-ordination of **Safety Precautions** at each **Connection Point** (or in the case of **OTSUA** operational prior to the **OTSUA Transfer Time**, **Transmission Interface Points**) when work (which includes testing) is to be carried out on a **System** which necessitates the provision of **Safety Precautions** on **HV Apparatus** (as defined in OC8A.1.6.2 and OC8B.1.7.2), pursuant to **OC8**. |
| **Safety From The System** | That condition which safeguards persons when work is to be carried out on or near a **System** from the dangers which are inherent in the **System**. |
| **Safety Key** | A key unique at the **Location** capable of operating a lock which will cause an **Isolating Device** and/or **Earthing Device** to be **Locked**. |
| **Safety Log** | A chronological record of messages relating to safety co-ordination sent and received by each **Safety Co-ordinator** under **OC8**. |
| **Safety Precautions** | **Isolation** and/or **Earthing**. |
| **Safety Rules** | The rules of the **Relevant Transmission Licensee** or a **User** that seek to ensure that persons working on **Plant** and/or **Apparatus** to which the rules apply are safeguarded from hazards arising from the **System**. |
| **Scottish Offshore Transmission System** | An **Offshore Transmission System** with an **Interface Point** in Scotland. |
| **Scottish Offshore Transmission Licensee** | A person who owns or operates a **Scottish Offshore Transmission System** pursuant to a **Transmission Licence**. |

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| **Scottish Transmission System** | Collectively **SPT's Transmission System** and **SHETL's Transmission System**, any **Competitively Appointed Transmission Licensee's Transmission System** with **Plant** and **Apparatus** located in **SPT's** or **SHETL's Transmission Area** and any **Scottish Offshore Transmission Systems**. |
| **Scottish User** | A **User** in Scotland or any **Offshore User** who owns or operates **Plant** and/or **Apparatus** connected (or which will at the **OTSUA Transfer Time** be connected) to a **Scottish Offshore Transmission System**. |
| **Secondary BM Unit** | Has the same meaning set out in the **BSC**. |
| **Secondary Response** | The automatic increase in **Active Power** output of a **Genset** or, as the case may be, the decrease in **Active Power Demand** in response to a **System Frequency** fall. This increase in **Active Power** output or, as the case may be, the decrease in **Active Power Demand** must be in accordance with the provisions of the relevant **Ancillary Services Agreement** which will provide that it will be fully available by 30 seconds from the time of the start of the **Frequency** fall and be sustainable for at least a further 30 minutes. The interpretation of the **Secondary Response** to a -0.5 Hz frequency change is shown diagrammatically in Figure CC.A.3.2 or Figure ECC.A.3.2. |
| **Secretary of State** | Has the same meaning as in the **Act**. |
| **Secured Event** | Has the meaning set out in the **Security and Quality of Supply Standard**. |
| **Security and Quality of Supply Standard (SQSS)** | The version of the document entitled 'Security and Quality of Supply Standard' established pursuant to the **Transmission Licence** and the **ESO Licence** in force at the time of entering into the relevant **Bilateral Agreement**. |
| **Self-Governance Criteria** | A proposed **Modification** that, if implemented,<br>(a) is unlikely to have a material effect on:<br>(i) existing or future electricity consumers; and<br>(ii) competition in the generation, storage, distribution, or supply of electricity or any commercial activities connected with the generation, storage, distribution or supply of electricity; and<br>(iii) the operation of the **National Electricity Transmission System**; and<br>(iv) matters relating to sustainable development, safety or security of supply, or the management of market or network emergencies; and<br>(v) the **Grid Code**'s governance procedures or the **Grid Code**'s modification procedures, and<br>(b) is unlikely to discriminate between different classes of Users.<br>(c) other than where the modification meets the **Fast Track Criteria**, will not constitute an amendment to the **Regulated Sections** of the Grid Code. |

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| **Self-Governance Modifications** | A **Grid Code Modification Proposal** that does not fall within the scope of a **Significant Code Review** and that meets the **Self-Governance Criteria** or which the **Authority** directs is to be treated as such any direction under GR.24.4. |
| **Self-Governance Statement** | The statement made by the **Grid Code Review Panel** and submitted to the **Authority**:<br>(a) confirming that, in its opinion, the **Self-Governance Criteria** are met and the proposed **Grid Code Modification Proposal** is suitable for the Self-Governance route; and<br>(b) providing a detailed explanation of the **Grid Code Review Panel**'s reasons for that opinion. |
| **Setpoint Voltage** | The value of voltage at the **Grid Entry Point**, or **User System Entry Point** if **Embedded**, on the automatic control system steady state operating characteristic, as a percentage of the nominal voltage, at which the transfer of **Reactive Power** between a **Power Park Module**, **DC Converter**, **HVDC Converter** or **Non-Synchronous Generating Unit** and the **Transmission System**, or **Network Operator's** system if **Embedded**, is zero. |
| **Settlement Period** | A period of 30 minutes ending on the hour and half-hour in each hour during a day. |
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| **$SF_6$ Gas Zone** | A segregated zone surrounding electrical conductors within a casing containing $SF_6$ gas. |
| **SHETL** | Scottish Hydro-Electric Transmission Limited. |
| **Shutdown** | In the case of a **Generating Unit** is the condition of a **Generating Unit** where the generator rotor is at rest or on barring or equivalent.<br>In the case of an **HVDC System** or **DC Converter Station**, is the condition of an **HVDC System** or **DC Converter Station** where the **HVDC System** or **DC Converter Station** is de-energised and therefore not importing or exporting **Apparent Power** to or from the **Total System**.<br>In the case of **Auxiliaries**, the state where they are de-energised and not capable of fulfilling their function until restarted or resupplied. |
| **Significant Code Review** | Means the period commencing on the start date of a **Significant Code Review** as stated in the notice issued by the **Authority**, and ending in the circumstances described in GR.16.6 or GR.16.7, as appropriate. |
| **Significant Code Review Phase** | Means the period commencing on the start date of a **Significant Code Review** as stated in the notice issued by the **Authority**, and ending in the circumstances described in GR.16.6 or GR.16.7, as appropriate. |
| **Significant Event** | An **Event**, as defined in OC3.4.1. |

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| **Significant Incident** | An **Event** which either:<br>(a) was notified by a **User** to **The Company** under **OC7**, and which **The Company** considers has had or may have had a significant effect on the **National Electricity Transmission System**, and **The Company** requires the **User** to report that **Event** in writing in accordance with **OC10** and notifies the **User** accordingly; or<br>(b) was notified by **The Company** to a **User** under **OC7**, and which that **User** considers has had or may have had a significant effect on that **User's System**, and that **User** requires **The Company** to report that **Event** in writing in accordance with the provisions of **OC10** and notifies **The Company** accordingly. |
| **Simultaneous Tap Change** | A tap change implemented on the generator step-up transformers of **Synchronised Gensets**, effected by **Generators** in response to an instruction from **The Company** issued simultaneously to the relevant **Power Stations**. The instruction, preceded by advance notice, must be effected as soon as possible, and in any event within one minute of receipt from **The Company** of the instruction. |
| **Single Intraday Coupling** | The continuous process where collected orders are matched and cross-zonal capacity is allocated simultaneously for different bidding zones in the intraday market. |
| **Single Line Diagram** | A schematic representation of a three-phase network in which the three phases are represented by single lines. The diagram shall include (but not necessarily be limited to) busbars, overhead lines, underground cables, power transformers and reactive compensation equipment. It shall also show where **Large Power Stations** are connected, and the points at which **Demand** is supplied. |
| **Single Point of Connection** | A single **Point of Connection**, with no interconnection through the **User's System** to another **Point of Connection**. |
| **Site Common Drawings** | Drawings prepared for each **Connection Site** (and in the case of **OTSDUW**, **Transmission Interface Site**) which incorporate **Connection Site** (and in the case of **OTSDUW**, **Transmission Interface Site**) layout drawings, electrical layout drawings, common protection/ control drawings and common services drawings. |
| **Site Responsibility Schedule** | A schedule containing the information and prepared on the basis of the provisions set out in Appendix 1 of the **CC** and Appendix E1 of the **ECC**. |
| **Slope** | The ratio of the steady state change in voltage, as a percentage of the nominal voltage, to the steady state change in **Reactive Power** output, in per unit of **Reactive Power** capability. For the avoidance of doubt, the value indicates the percentage voltage reduction that will result in a 1 per unit increase in **Reactive Power** generation. |
| **Small Participant** | Has the meaning given in the **CUSC**. |

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| **Small Power Station** | A **Power Station** which is<br>(a) directly connected to:<br>(i) **NGET's Transmission System** where such **Power Station** has a **Registered Capacity** of less than 50MW; or<br>(ii) **SPT's Transmission System** where such **Power Station** has a **Registered Capacity** of less than 30MW; or<br>(iii) **SHETL's Transmission System** where such a **Power Station** has a **Registered Capacity** of less than 10 MW; or<br>(iv) an **Offshore Transmission System** where such **Power Station** has a **Registered Capacity** of less than 10MW;<br>or,<br>(b) **Embedded** within a **User System** (or part thereof) where such **User System** (or part thereof) is connected under normal operating conditions to:<br>(i) **NGET's Transmission System** and such **Power Station** has a **Registered Capacity** of less than 50MW; or<br>(ii) **SPT's Transmission System** and such **Power Station** has a **Registered Capacity** of less than 30MW; or<br>(iii) **SHETL's Transmission System** and such **Power Station** has a **Registered Capacity** of less than 10MW;<br>or,<br>(c) **Embedded** within a **User System** (or part thereof) where the **User System** (or part thereof) is not connected to the **National Electricity Transmission System**, although such **Power Station** is in:<br>(i) **NGET's Transmission Area** and such **Power Station** has a **Registered Capacity** of less than 50MW; or<br>(ii) **SPT's Transmission Area** and such **Power Station** has a **Registered Capacity** of less than 30MW; or<br>(iii) **SHETL's Transmission Area** and such **Power Station** has a **Registered Capacity** of less than 10MW;<br>For the avoidance of doubt, a **Small Power Station** could comprise of **Type A**, **Type B**, **Type C** or **Type D Power Generating Modules**. |
| **Speeder Motor Setting Range** | The minimum and maximum no-load speeds (expressed as a percentage of rated speed) to which the turbine is capable of being controlled, by the speeder motor or equivalent, when the **Generating Unit** terminals are on open circuit. |
| **SPT** | SP Transmission Limited plc |
| **Standard Contract Terms** | The standard terms and conditions applicable to **Ancillary Services** provided by **Demand Response Providers** and published on the **Website** from time to time. |

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| **Standard Modifications** | A **Grid Code Modification Proposal** that does not fall within the scope of a **Significant Code Review** subject to any direction by the **Authority** pursuant to GR.16.3 and GR.16.4, nor meets the **Self-Governance Criteria** subject to any direction by the **Authority** pursuant to GR.24.4 and in accordance with any direction under GR.24.2. A **Grid Code Modification Proposal** that constitutes an amendment to the **Regulated Sections** of the Grid Code shall be a **Standard Modification** except where it is an **Urgent Modification** or where it meets the **Fast Track Criteria**. |
| **Standard Planning Data** | The general data required by **The Company** under the **PC**. It is generally also the data which **The Company** requires from a **User** in an application for a **CUSC Contract**, as reflected in the **PC**. |
| **Standard Product** | Means a harmonised balancing product defined by all EU TSOs for the exchange of balance services. |
| **Specific Product** | Means in the context of Balancing Services a product that is not a standard product. |
| **Start Time** | The time named as such in an instruction issued by **The Company** pursuant to the **BC**. |
| **Start-Up** | In the case of a **Generating Unit** is the action of bringing a **Generating Unit** from **Shutdown** to **Synchronous Speed**.<br><br>In the case of an **HVDC System** or **DC Converter Station**, is the action of bringing the **HVDC System** or **DC Converter Station** from **Shutdown** to a state where it is energised. |
| **Statement of Readiness** | Has the meaning set out in the **Bilateral Agreement** and/or **Construction Agreement**. |
| **Station Board** | A switchboard through which electrical power is supplied to the **Auxiliaries** of a **Power Station**, and which is supplied by a **Station Transformer**. It may be interconnected with a **Unit Board**. |
| **Station Transformer** | A transformer supplying electrical power to the **Auxiliaries** of<br>(a) a **Power Station**, which is not directly connected to the **Generating Unit** terminals (typical voltage ratios being 132/11kV or 275/11kV), or<br>(b) a **DC Converter Station** or **HVDC Converter Station**. |
| **STC Committee** | The committee established under the **STC**. |
| **Steam Unit** | A **Generating Unit** whose prime mover converts the heat-energy in steam to mechanical energy. |
| **Storage User** | A **Generator** who owns or operates one or more **Electricity Storage Modules**. For the avoidance of doubt:<br>(a) **Assimilated Law** (Commission Regulation (EU) 2016/631, Commission Regulation (EU) 2016/1388 and Commission Regulation (EU) 2016/1485) shall not apply to **Storage Users**; and<br>(b) the **European Connection Conditions** (**ECC**'s) shall apply to **Storage Users** on the basis set out in Paragraph ECC1.1(d). |

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| **Subtransmission System** | The part of a **User's System** which operates at a single transformation below the voltage of the relevant **Transmission System**. |
| **Substantial Modification** | A **Modification** in relation to modernisation or replacement of the **User's Main Plant and Apparatus** which impacts its technical capabilities, which, following notification by the relevant **User** to **The Company**, results in substantial amendment to the **Bilateral Agreement**. |
| **Supergrid Voltage** | Any voltage greater than 200kV. |
| **Supplier** | (a) A person supplying electricity under an **Electricity Supply Licence**; or<br>(b) A person supplying electricity under exemption under the **Act**;<br>in each case acting in its capacity as a supplier of electricity to **Customers** in **Great Britain**. |
| **Surplus** | A MW figure equal to the total **Output Usable:**<br>(a) minus the forecast of **Active Power Demand**, and<br>(b) minus the **Operational Planning Margin**. |
| **Synchronised** | (a) The condition where an incoming **Power Generating Module**, **Generating Unit** or **Power Park Module** or **DC Converter** or **HVDC Converter** or **System** is connected to the busbars of another **System** so that the **Frequencies** and phase relationships of that **Power Generating Module**, **Generating Unit**, **Power Park Module**, **DC Converter**, **HVDC Converter** or **System**, as the case may be, and the **System** to which it is connected are identical, like terms shall be construed accordingly e.g. **"Synchronism"**.<br>(b) The condition where an importing **BM Unit** is consuming electricity. |
| **Synchronous Electricity Storage Module** | A **Synchronous Power Generating Module** which can convert or re-convert electrical energy from another source of energy such that the frequency of the generated voltage, the rotor speed and the frequency of network voltage are in a constant ratio and thus in synchronism. For the avoidance of doubt a **Synchronous Electricity Storage Module** could comprise of one or more **Synchronous Electricity Storage Units**. |
| **Synchronous Electricity Storage Unit** | A **Synchronous Generating Unit** which can supply or absorb electrical energy such that the frequency of the generated voltage, the rotor speed and the frequency of the equipment are in constant ratio and thus in synchronism with the network. |
| **Synchronising Generation** | The amount of MW (in whole MW) produced at the moment of synchronising. |
| **Synchronising Group** | A group of two or more **Gensets**) which require a minimum time interval between their **Synchronising** or **De-Synchronising** times. |
| **Synchronous Area** | An area covered by synchronously interconnected **Transmission Licensees**, such as the **Synchronous Areas** of Continental Europe, Great Britain, Ireland-Northern Ireland and Nordic and the power systems of Lithuania, Latvia and Estonia, together referred to as 'Baltic' which are part of a wider **Synchronous Area**; |

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| **Synchronous Compensation** | The operation of rotating synchronous **Apparatus** for the specific purpose of either the generation or absorption of **Reactive Power**. |
| **Synchronous Compensation Equipment** | **Apparatus** which has the function of providing **Synchronous Compensation**. For the avoidance of doubt, one or more **Synchronous Compensation** units would not constitute an **Electricity Storage Module** unless it could be operated in a controllable manner. |
| **Synchronous Electricity Storage Module** | A **Synchronous Power Generating Module** which can convert and reconvert electrical energy from another source of energy such that the frequency of the generated voltage, the rotor speed and the frequency of network voltage are in a constant ratio and thus in synchronism. For the avoidance of doubt a **Synchronous Electricity Storage Module** could comprise of one or more **Synchronous Electricity Storage Units**. |
| **Synchronous Electricity Storage Unit** | A **Synchronous Generating Unit** which can supply and absorb electrical energy such that the frequency of the generated voltage, the rotor speed and the frequency of the equipment are in constant ratio and thus in synchronism with the network. |
| **Synchronous Flywheel** | An item of synchronously rotating **Plant** for the specific purpose of contributing inertia to the **System**. One or more **Synchronous Flywheels** would not be considered to form an **Electricity Storage Module** unless it could be operated in a controllable manner for its AC input and output power. |
| **Synchronous Generating Unit** | Any **Onshore Synchronous Generating Unit** or **Offshore Synchronous Generating Unit**. |
| **Synchronous Generating Unit Performance Chart** | A diagram showing the **Active Power** (MW) and **Reactive Power** (MVAr) capability limits within which a **Synchronous Generating Unit** at its stator terminals (which is part of a **Synchronous Power Generating Module**) will be expected to operate under steady state conditions. |
| **Synchronous Power-Generating Module** | An indivisible set of installations which can convert or re-convert electrical energy from another source of energy such that the frequency of the supplied voltage, the rotor speed and the frequency of network voltage are in a constant ratio and thus in synchronism. For the avoidance of doubt, a **Synchronous Power Generating Module** could comprise of one or more **Synchronous Generating Units** or one or more **Synchronous Electricity Storage Units**. |
| **Synchronous Power Generating Module Matrix** | The matrix described in Appendix 1 to BC1 under the heading **Synchronous Power Generating Module Matrix**. |
| **Synchronous Power Generating Module Planning Matrix** | A matrix in the form set out in Appendix 5 of OC2 showing the combination of **Synchronous Generating Units** within a **Synchronous Power Generating Module** which would be running in relation to any given MW output. |
| **Synchronous Power Generating Unit** | Has the same meaning as a **Synchronous Generating Unit** and would be considered to be part of a **Power Generating Module.** |
| **Synchronous Speed** | That speed required by a **Generating Unit** to enable it to be **Synchronised** to a **System**. |

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| **System** | Any **User System** and/or the **National Electricity Transmission System**, as the case may be. |
| **System Ancillary Services** | Collectively **Part 1 System Ancillary Services** and **Part 2 System Ancillary Services**. |
| **System Constraint** | A limitation on the use of a **System** due to lack of transmission capacity or other **System** conditions. |
| **System Constrained Capacity** | That portion of **Registered Capacity** or Regis**tered Import Capacity** not available due to a **System Constraint**. |
| **System Constraint Group** | A part of the **National Electricity Transmission System** which, because of **System Constraints**, is subject to limits of **Active Power** which can flow into or out of (as the case may be) that part. |
| **System Defence Plan** | A document prepared by **The Company**, as published on its **Website**, outlining how the requirements of the "defence plan", as provided for by **Assimilated Law** (Commission Regulation (EU) 2017/2196), has been implemented within the **GB Synchronous Area**. |
| **System Fault Dependability Index** or **Dp** | A measure of the ability of **Protection** to initiate successful tripping of circuit-breakers which are associated with a faulty item of **Apparatus**. It is calculated using the formula:<br>**Dp** = $1 - F_1/A$<br>Where:<br>A = Total number of **System** faults<br>$F_1$ = Number of **System** faults where there was a failure to trip a circuit-breaker. |
| **System Incidents Report** | A report submitted to the GCRP on a monthly basis, containing, but not limited to, a list of **Significant Events**, as detailed in OC3.4.1. |
| **System Margin** | The margin in any period between<br>(a) the sum of Maximum Export Limits and<br>(b) forecast **Demand** and the **Operating Margin**,<br>for that period. |
| **System Negative Reserve Active Power Margin** or **System NRAPM** | That margin of **Active Power** sufficient to allow the largest loss of **Load** at any time. |
| **System Operator - Transmission Owner Code** or **STC** | Has the meaning set out in the **ESO Licence.** |
| **System Restoration** | The procedure necessary for a recovery from a **Total Shutdown** or **Partial Shutdown**. |
| **System Restoration Region** | Those regions of the **Total System** as defined in Appendix 1 of OC9. |

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| **System Restoration Plan** | A document prepared by **The Company**, as published on its **Website**, outlining how the requirements of the "restoration plan", as defined in **Assimilated Law** (Commission Regulation (EU) 2017/2196), has been implemented within the **GB Synchronous Area**. |
| **System Telephony** | An alternative method by which a **User's Responsible Engineer/Operator**, the relevant **Transmission Licensees' Control Engeineers** and **The Company's Control Engineer(s)** speak to one and another for the purposes of control of the **Total System** in both normal operating conditions and where practicable, emergency operating conditions. |
| **System Tests** | Tests which involve simulating conditions, or the controlled application of irregular, unusual or extreme conditions, on the **Total System**, or any part of the **Total System**, but which do not include commissioning or recommissioning tests or any other tests of a minor nature. |
| **System to Demand Intertrip Scheme** | An intertrip scheme which disconnects **Demand** when a **System** fault has arisen to prevent abnormal conditions occurring on the **System**. |
| **System to Generator Operational Intertripping** | A **Balancing Service** involving the initiation by a **System to Generator Operational Intertripping Scheme** of automatic tripping of the **User's** circuit breaker(s), or **Relevant Transmission Licensee's** circuit breaker(s) where agreed by **The Company**, the **User** and the **Relevant Transmission Licensee**, resulting in the tripping of **BM Unit(s)** or (where relevant) **Generating Unit(s)** comprised in a **BM Unit** to prevent abnormal system conditions occurring, such as over voltage, overload, **System** instability, etc, after the tripping of other circuit-breakers following power **System** fault(s). |
| **System to Generator Operational Intertripping Scheme** | A **System** to **Generating Unit** or **System** to **CCGT Module** or **System** to **Power Park Module** or **System** to **Power Generating Module** or **System** to **Electricity Storage Module Intertripping Scheme** forming a condition of connection and specified in Appendix F3 of the relevant **Bilateral Agreement**, being either a **Category 1 Intertripping Scheme**, **Category 2 Intertripping Scheme**, **Category 3 Intertripping Scheme** or C**ategory 4 Intertripping Scheme**. |
| **Target Frequency** | That **Frequency** determined by **The Company**, in its reasonable opinion, as the desired operating **Frequency** of the **Total System** or of a relevant **Power Island**. This will normally be 50.00Hz plus or minus 0.05Hz, except in exceptional circumstances as determined by **The Company** for example which may be operating the **System** during disputes affecting fuel supplies or following a **Total Shutdown** or **Partial Shutdown** where **Power Islands** are established, and each **Power Island** has its own unique **Frequency**. |
| **Technical Specification** | In relation to **Plant** and/or **Apparatus**,<br>(a) the relevant **European Specification**; or<br>(b) if there is no relevant **European Specification**, other relevant standards which are in common use in the European Community. |
| **TERRE** | Trans European Replacement Reserves Exchange – a market covering the procurement of replacement reserves across Europe. |

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| **TERRE Activation Period** | A period of time lasting 15 minutes and starting at either 0, 15, 30 or 45 minutes past the hour (e.g. 10:00 to 10:15). There are 4 **TERRE Activation Periods** in one **TERRE Auction Period**. |
| **TERRE Auction Period** | A period of time lasting one hour and starting and ending on the hour (e.g. from 10:00 to 11:00). Hence there are 24 **TERRE Auction Periods** in a day. |
| **TERRE Bid** | A submission by a **BM Participant** covering the price and MW deviation offered into the **TERRE** auction (please note – in the **Balancing Mechanism** the term bid has a different meaning – in this case a bid can be an upward or downward MW change). |
| **TERRE Central Platform** | An IT system which implements the **TERRE** auction. |
| **TERRE Data Validation and Consistency Rules** | A document produced by the central **TERRE** project detailing the correct format of submissions for **TERRE**. |
| **TERRE Gate Closure** | 60 minutes before the start of the **TERRE Auction Period** (note still ongoing discussions if this may become 55 minutes). |
| **TERRE Instruction Guide** | Details specific rules for creating an **RR Instruction** from an **RR Acceptance**. |
| **Test Co-ordinator** | A person who co-ordinates **System Tests**. |
| **Test Panel** | A panel, whose composition is detailed in **OC12**, which is responsible, inter alia, for considering a proposed **System Test**, and submitting a **Proposal Report** and a **Test Programme**. |
| **Test Plan** | A document prepared by **The Company**, as published on its **Website**, outlining how the requirements of the "**Test Plan**", as provided for by **Assimilated Law** (Commission Regulation (EU) 2017/2196), has been implemented within the **GB Synchronous Area**. |
| **Test Programme** | A programme submitted by the **Test Panel** to **The Company**, the **Test Proposer**, and each **User** identified by **The Company** under OC12.4.2.1, which states the switching sequence and proposed timings of the switching sequence, a list of those staff involved in carrying out the **System Test** (including those responsible for the site safety) and such other matters as the **Test Panel** deems appropriate. |
| **Test Proposer** | The person who submits a **Proposal Notice**. |
| **Test Signal** | A signal in the form of a sine wave, applied to a **GBGF-I** to demonstrate its ability to contribute to **Active Damping Power**. |
| **The Company** | Has the meaning given to **NESO** or **National Energy System Operator**. . |
| **The Company Control Engineer** | The nominated person employed by **The Company** to direct the operation of the **National Electricity Transmission System** or such person as nominated by **The Company**. |
| **The Company Operational Strategy** | **The Company's** operational procedures which form the guidelines for operation of the **National Electricity Transmission System**. |

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| **Top Up Restoration Capability** | The ability of a **Restoration Contractor's Plant** to **Start-Up** from **Shutdown** and to be **Synchronised** and remain **Synchronised** to a part of the **Total System** upon instruction from **The Company** or **Relevant Transmission Licensee** (in Scotland) or relevant **Network Operator**, within a defined time period, pursuant to the terms of the **Top Up Restoration Contract**, once external electrical power supplies are restored to that **Restoration Contractor's** site. In the case of a **Local Joint Restoration Plan**, an instruction from **The Company** or **Transmission Licensee** in Scotland to a **Restoration Contractor** in respect of their **Top Up Restoration Plant** would generally be issued immediately after an instruction to an **Anchor Restoration Contractor** with the **Top Up Capability** expected to be delivered consecutively after external power supplies had been restored to the **Top Up Restoration Contractor's** site. In the case of a **Distribution Restoration Zone Plan**, an instruction from a **Network Operator** to a **Restoration Contractor** in respect of their **Top Up Restoration Plant** would generally be issued immediately after an instruction to an **Anchor Restoration Contractor** with the **Top Up Capability** expected to be delivered consecutively after external power supplies had been restored to the **Top Up Restoration Contractor's** site. For the avoidance of doubt a **Restoration Contractor** with a **Top Up Restoration Capability** shall have sufficient **Auxiliary Energy Supplies** to be capable of delivering the service they have agreed to provide as soon as their **Connection Point** or **User System Entry Point** is energised. |
| **Top Up Restoration Contract** | In the case of a **Local Joint Restoration Plan** or **Offshore Local Joint Restoration Plan** is a contract between **The Company** and **Top Up Restoration Contractor** for the provision of a **Top Up Restoration Capability**. In the case of a **Distribution Restoration Zone Plan**, an agreement between **The Company** and relevant **Network Operator** and **Top Up Restoration Contractor** for the provision of **Top Up Restoration Capability**. |
| **Top Up Restoration Contractor** | A **Restoration Contractor** with a **Top Up Restoration Contract.** |
| **Top Up Restoration Plant** | **Plant** owned and operated by a **Top Up Restoration Contractor**. |
| **Top Up Restoration Plant Test** | A test conducted on a **Top Up Restoration Plant** to confirm it is capable of meeting the requirements of a **Top Up Restoration Contract**. |
| **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 **The Company's** directions relating to **System Restoration**. |
| **Total System** | The **National Electricity Transmission System** and all **User Systems** in the **National Electricity Transmission System Operator Area**. |
| **Trading Point** | A commercial and, where so specified in the Grid Code, an operational interface between a **User** and **The Company**, which a **User** has notified to **The Company**. |
| **Transfer Date** | Such date as may be appointed by the **Secretary of State** by order under section 65 of the **Act**. |

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| **Transmission** | Means, when used in conjunction with another term relating to equipment or a site, whether defined or not, that the associated term is to be read as being part of or directly associated with the **National Electricity Transmission System**, and not of or with the **User System**. |
| **Transmission Area** | Has the meaning set out in the **Transmission Licence** of a **Transmission Licensee**. |
| **Transmission Connected Demand Facilities** | A **Demand Facility** which has a **Grid Supply Point** to the **National Electricity Transmission System**. |
| **Transmission DC Converter** | Any **Transmission Licensee Apparatus** (or **OTSUA** that will become **Transmission Licensee Apparatus** at the **OTSUA Transfer Time**) used to convert alternating current electricity to direct current electricity, or vice versa. A **Transmission Network DC Converter** (which could include an **HVDC System** owned by an **Offshore Transmission Licensee** or **Generator** in respect of **OTSUA**) 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. |
| **Transmission Entry Capacity** | Has the meaning set out in the **CUSC**. |
| **Transmission Interface Circuit** | In **NGET's Transmission Area** or a **Competitively Appointed Transmission Licensee** with **Plant and Apparatus** located in **NGET's Transmission Area**, a **Transmission** circuit which connects a **System** operating at a voltage above 132kV to a **System** operating at a voltage of 132kV or below<br><br>In **SHETL's Transmission Area** and **SPT's Transmission Area**, or a **Competitively Appointed Transmission Licensee** with **Plant** and **Apparatus** located in **SHETL's Transmission Area** and/or **SPT's Transmission Area**, a **Transmission** circuit which connects a **System** operating at a voltage of 132kV or above to a **System** operating at a voltage below 132kV. |
| **Transmission Interface Point** | Means the electrical point of connection between the **Offshore Transmission System** and an **Onshore Transmission System**. |
| **Transmission Interface Site** | The site at which the **Transmission Interface Point** is located. |
| **Transmission Licence** | A licence granted under Section 6(1)(b) of the **Act**. |
| **Transmission Licensee** | Any **Onshore Transmission Licensee** or **Offshore Transmission Licensee**. |
| **Transmission Site** | Means a site owned (or occupied pursuant to a lease, licence or other agreement) by a **Relevant Transmission Licensee** in which there is a **Connection Point**. For the avoidance of doubt, a site owned by a **User** but occupied by the **Relevant Transmission Licensee** as aforesaid, is a **Transmission Site**. |

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| **Transmission System** | Has the same meaning as the term "licensee's transmission system" in the **Transmission Licence** of a **Transmission Licensee**.<br><br>Where references are made in this document to **NGET's**, **SPT's**, or **SHETL's Transmission System**, such reference shall be deemed to include:<br><br>• a **Competitively Appointed Transmission Licensee's Transmission System** where that **Competitively Appointed Transmission Licensee**'s **Transmission System** has onshore interface point(s) with only one of **NGET**'**s, SPT's**, or **SHETL's Transmission Systems**; or<br><br>• elements of a **Competitively Appointed Transmission Licensee**'s **Transmission System** located within **NGET's**, **SPT's**, or **SHETL's Transmission Area** where the **Competitively Appointed Transmission Licensee's Transmission System** has onshore interface point(s) with more than one of **NGET's**, **SPT's** and/or **SHETL's Transmission Systems**. |
| **Turbine Time Constant** | Determined at **Registered Capacity**, the turbine time constant will be construed in accordance with the principles of the IEEE Committee Report "Dynamic Models for Steam and Hydro Turbines in Power System Studies" published in 1973 which apply to such phrase. |
| **Type A Power Generating Module** | A **Power-Generating Module** (including an **Electricity Storage Module**) with a **Grid Entry Point** or **User System Entry Point** below 110 kV and a **Maximum Capacity** of 0.8 kW or greater but less than 1MW; |
| **Type B Power Generating Module** | A **Power-Generating Module** (including an **Electricity Storage Module**) with a **Grid Entry Point** or **User System Entry Point** below 110 kV and a **Maximum Capacity** of 1MW or greater but less than 10MW; |
| **Type C Power Generating Module** | A **Power-Generating Module** (including an **Electricity Storage Module**) with a **Grid Entry Point** or **User System Entry Point** below 110 kV and a **Maximum Capacity** of 10MW or greater but less than 50MW; |
| **Type D Power Generating Module** | A **Power-generating Module**: (including an **Electricity Storage Module**):<br>with a **Grid Entry Point** or **User System Entry Point** at, or greater than, 110 kV; or<br>with a **Grid Entry Point** or **User System Entry Point** below 110 kV and with **Maximum Capacity** of 50MW or greater |
| **Unbalanced Load** | The situation where the **Load** on each phase is not equal. |
| **Under-excitation Limiter** | Shall have the meaning ascribed to that term in **IEC** 34-16-1:1991 [equivalent to **British Standard BS**4999 Section 116.1: 1992]. |
| **Under Frequency Relay** | An electrical measuring relay intended to operate when its characteristic quantity (**Frequency**) reaches the relay settings by a decrease in **Frequency**. |
| **Unit Board** | A switchboard through which electrical power is supplied to the **Auxiliaries** of a **Generating Unit** and which is supplied by a **Unit Transformer**. It may be interconnected with a **Station Board**. |
| **Unit Transformer** | A transformer directly connected to a **Generating Unit's** terminals, and which supplies power to the **Auxiliaries** of a **Generating Unit**. Typical voltage ratios are 23/11kV and 15/6.6kV. |

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| **Unit Load Controller Response Time Constant** | The time constant, expressed in units of seconds, of the power output increase which occurs in the **Secondary Response** timescale in response to a step change in **System Frequency**. |
| **Unresolved Issues** | Any relevant Grid Code provisions or **Bilateral Agreement** requirements identified by **The Company** with which the relevant **User** has not demonstrated compliance to **The Company's** reasonable satisfaction at the date of issue of the **Preliminary Operational Notification** and/or **Interim Operational Notification** and/or **Limited Operational Notification** and which are detailed in such **Preliminary Operational Notification** and/or **Interim Operational Notification** and/or **Limited Operational Notification**. |
| **Urgent Modification** | A **Grid Code Modification Proposal** treated or to be treated as an **Urgent Modification** in accordance with GR.23. |
| **User** | A term utilised in various sections of the Grid Code to refer to the persons using the **National Electricity Transmission System**, as more particularly identified in each section of the Grid Code concerned. In the **Preface** and the **General Conditions** the term means any person to whom the Grid Code applies. The term **User** includes an **EU Code User** and a **GB Code User**. |
| **User Data File Structure** | The file structure given at **DRC 18** which will be specified by **The Company** which a **Generator** or **DC Converter Station** owner or **HVDC System Owner** must use for the purposes of the **CP** or the **ECP** to submit **DRC** data Schedules and information demonstrating compliance with the Grid Code and, where applicable, with the **CUSC Contract(s)**, unless otherwise agreed by **The Company**. |
| **User Development** | In the **PC** means either **User's Plant** and/or **Apparatus** to be connected to the **National Electricity Transmission System**, or a **Modification** relating to a **User's Plant** and/or **Apparatus** already connected to the **National Electricity Transmission System**, or a proposed new connection or **Modification** to the connection within the **User System**. |
| **User Self Certification of Compliance** | A certificate, in the form attached at CP.A.2.(1) or ECP.A.2.(1) completed by a **Generator** or **DC Converter Station** owner or **HVDC System Owner** to which the **Compliance Statement** is attached which confirms that such **Plant** and **Apparatus** complies with the relevant Grid Code provisions and where appropriate, with the **CUSC Contract**(s), as identified in the **Compliance Statement** and, if appropriate, identifies any **Unresolved Issues** and/or any exceptions to such compliance and details the derogation(s) granted in respect of such exceptions. |
| **User Site** | A site owned (or occupied pursuant to a lease, licence or other agreement) by a **User** in which there is a **Connection Point**. For the avoidance of doubt, a site owned by a **Relevant Transmission Licensee** but occupied by a **User** as aforesaid, is a **User Site**. |

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| **User System** | Any system owned or operated by a **User** comprising:-<br>(a) **Power Generating Modules** or **Generating Units**; and/or<br>(b) Systems consisting (wholly or mainly) of electric lines used for the distribution of electricity from **Grid Supply Points** or **Generating Units** or **Power Generating Modules** or other entry points to the point of delivery to **Customers**, or other **Users**;<br>and **Plant** and/or **Apparatus** (including prior to the **OTSUA Transfer Time**, any **OTSUA**) connecting:-<br>(c) The system as described above; or<br>(d) **Non-Embedded Customers** equipment;<br>to the **National Electricity Transmission System** or to the relevant other **User System**, as the case may be.<br>The **User System** includes any **Remote Transmission Assets** operated by such **User** or other person and any **Plant** and/or **Apparatus** and meters owned or operated by the **User** or other person in connection with the distribution of electricity but does not include any part of the **National Electricity Transmission System**. |
| **User System Entry Point** | A point at which;<br>a **Power Generating Module**,; or<br>a **Generating Unit**, ; or,<br>a **CCGT Module**;or<br>a **CCGT Unit**; or<br>a **Power Park Module**; or<br>an **Electricity Storage Module**; or<br>a **DC Converter**; or<br>an **HVDC Converter**,<br>and which is **Embedded** connects to the **User System**. |
| **Virtual Lead Party** | As defined in the **BSC**. |
| **Voltage Jump Reactive Power** | The transient **Reactive Power** injected or absorbed from a **Grid Forming Plant** to the **Total System** as a result of either a step or ramp change in the difference between the voltage magnitude and/or phase of the voltage of the **Internal Voltage Source** of the **Grid Forming Plant** and **Grid Entry Point** or **User System Entry Point**.<br><br>In the event of a voltage magnitude and phase change at the **Grid Entry Point** or **User System Entry Point**, a **Grid Forming Plant** will instantaneously (within 5ms) supply **Voltage Jump Reactive Power** to the **Total System** as a result of the voltage magnitude change. |
| **Water Time Constant** | Bears the meaning ascribed to the term "Water inertia time" in **IEC**308. |
| **Website** | The site established by **The Company** on the World-Wide Web for the exchange of information among **Users** and other interested persons in accordance with such restrictions on access as may be determined from time to time by **The Company**. |

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| **Weekly ACS Conditions** | Means 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**. |
| **WG Consultation Alternative Request** | Any request from an **Authorised Electricity Operator**; the **Citizens Advice** or the **Citizens Advice Scotland**, **The Company** or a **Materially Affected Party** for a **Workgroup Alternative Grid Code Modification** to be developed by the **Workgroup** expressed as such and which contains the information referred to at GR.20.16. For the avoidance of doubt, any **WG Consultation Alternative Request** does not constitute either a **Grid Code Modification Proposal** or a **Workgroup Alternative Grid Code Modification**. |
| **Workgroup** | A **Workgroup** established by the **Grid Code Review Panel** pursuant to GR.20.1; |
| **Workgroup Consultation** | As defined in GR.20.13, and any further consultation which may be directed by the **Grid Code Review Panel** pursuant to GR.20.20; |
| **Workgroup Alternative Grid Code Modification** | An alternative modification to the **Grid Code Modification Proposal** developed by the **Workgroup** under the **Workgroup** terms of reference (either as a result of a **Workgroup Consultation** or otherwise) and which is believed by a majority of the members of the **Workgroup** or by the chairperson of the **Workgroup** to better facilitate the **Grid Code Objectives** than the **Grid Code Modification Proposal** or the current version of the **Grid Code**; |
| **Zonal System Security Requirements** | That generation required, within the boundary circuits defining the **System Zone**, which when added to the secured transfer capability of the boundary circuits exactly matches the **Demand** within the **System Zone**. |

GD.2 Construction of References

GD.2.1 In the Grid Code:

(i) a table of contents, a Preface, a Revision section, headings, and the Appendix to this **Glossary and Definitions** are inserted for convenience only and shall be ignored in construing the Grid Code;

(ii) unless the context otherwise requires, all references to a particular paragraph, sub-paragraph, Appendix or Schedule shall be a reference to that paragraph, sub-paragraph Appendix or Schedule in or to that part of the Grid Code in which the reference is made;

(iii) unless the context otherwise requires, the singular shall include the plural and vice versa, references to any gender shall include all other genders and references to persons shall include any individual, body corporate, corporation, joint venture, trust, unincorporated association, organisation, firm or partnership and any other entity, in each case whether or not having a separate legal personality;

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

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

(vi) where the **Glossary and Definitions** refers to any word or term which is more particularly defined in a part of the Grid Code, the definition in that part of the Grid Code will prevail (unless otherwise stated) over the definition in the **Glossary & Definitions** in the event of any inconsistency;

(vii) a cross-reference to another document or part of the Grid Code shall not of itself impose any additional or further or co-existent obligation or confer any additional or further or co-existent right in the part of the text where such cross-reference is contained;

(viii) nothing in the Grid Code is intended to or shall derogate from **The Company's** statutory or licence obligations;

(ix) a "holding company" means, in relation to any person, a holding company of such person within the meaning of section 736, 736A and 736B of the Companies Act 1985 as substituted by section 144 of the Companies Act 1989 and, if that latter section is not in force at the **Transfer Date**, as if such latter section were in force at such date;

(x) a "subsidiary" means, in relation to any person, a subsidiary of such person within the meaning of section 736, 736A and 736B of the Companies Act 1985 as substituted by section 144 of the Companies Act 1989 and, if that latter section is not in force at the **Transfer Date**, as if such latter section were in force at such date;

(xi) references to time are to London time; and

(xii) (a) Save where (b) below applies, where there is a reference to an item of data being expressed in a whole number of MW, fractions of a MW below 0.5 shall be rounded down to the nearest whole MW and fractions of a MW of 0.5 and above shall be rounded up to the nearest whole MW;

(b) In the case of the definition of **Registered Capacity** or **Maximum Capacity**, fractions of a MW below 0.05 shall be rounded down to one decimal place and fractions of a MW of 0.05 and above shall be rounded up to one decimal place.

(xiii) For the purposes of the Grid Code, physical quantities such as current or voltage are not defined terms as their meaning will vary depending upon the context of the obligation. For example, voltage could mean positive phase sequence root mean square voltage, instantaneous voltage, phase to phase voltage, phase to earth voltage. The same issue equally applies to current, and therefore the terms current and voltage should remain undefined with the meaning depending upon the context of the application. **Assimilated Law** (Commission Regulation (EU) 2016/631) defines requirements of current and voltage but they have not been adopted as part of EU implementation for the reasons outlined above.

(xiv) Except where expressly stated to the contrary, reference to Commission Regulations means the Commission Regulation (EU) as it forms part of **Assimilated Law**, as such regulation may be amended.

**< END OF GLOSSARY & DEFINITIONS>**

# PLANNING CODE
**(PC)**

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PC.1 INTRODUCTION

PC.1.1 The **Planning Code** ("**PC**") specifies the technical and design criteria and procedures to be applied by **The Company** in the planning and development of the **National Electricity Transmission System** and to be taken into account by **Users** in the planning and development of their own **Systems**. In the case of **OTSUA**, the **PC** also specifies the technical and design criteria and procedures to be applied by the **User** in the planning and development of the **OTSUA**. It details information to be supplied by **Users** to **The Company**, and certain information to be supplied by **The Company** to **Users**. **The Company** has obligations under the **STC** to inform **Relevant Transmission Licensees** of data required for the planning of the **National Electricity Transmission System**. In respect of **PC** data, **The Company** may pass on **User** data to a **Relevant Transmission Licensee**, as detailed in PC.3.4 and PC.3.5.

PC.1.1A Provisions of the **PC** which apply in relation to **OTSDUW** and **OTSUA** shall apply up to the **OTSUA Transfer Time**, whereupon such provisions shall (without prejudice to any prior non-compliance) cease to apply, without prejudice to the continuing application of provisions of the **PC** applying in relation to the relevant **Offshore Transmission System** and/or **Connection Site**.

PC.1.1B As used in the **PC**:

(a) **National Electricity Transmission System** excludes **OTSDUW Plant and Apparatus** (prior to the **OTSUA Transfer Time**) unless the context otherwise requires;

(b) and User Development includes **OTSDUW** unless the context otherwise requires.

PC.1.2 The **Users** referred to above are defined, for the purpose of the **PC**, in PC.3.1.

PC.1.3 Development of the **National Electricity Transmission System**, involving its reinforcement or extension, will arise for a number of reasons including, but not limited to:

(a) a development on a **User System** already connected to the **National Electricity Transmission System**;

(b) the introduction of a new **Connection Site** or the **Modification** of an existing **Connection Site** between a **User System** and the **National Electricity Transmission System**;

(c) the cumulative effect of a number of such developments referred to in (a) and (b) by one or more **Users**.

PC.1.4 Accordingly, the reinforcement or extension of the **National Electricity Transmission System** may involve work:

(a) at a substation at a **Connection Site** where **User's Plant** and/or **Apparatus** is connected to the **National Electricity Transmission System** (or in the case of **OTSDUW**, at a substation at an **Interface Point**);

(b) on transmission lines or other facilities which join that **Connection Site** (or in the case of **OTSDUW**, **Interface Point**) to the remainder of the **National Electricity Transmission System**;

(c) on transmission lines or other facilities at or between points remote from that **Connection Site** (or in the case of **OTSDUW**, **Interface Point**).

PC.1.5 The time required for the planning and development of the **National Electricity Transmission System** will depend on the type and extent of the necessary reinforcement and/or extension work, the need or otherwise for statutory planning consent, the associated possibility of the need for a public inquiry and the degree of complexity in undertaking the new work while maintaining satisfactory security and quality of supply on the existing **National Electricity Transmission System**.

PC1.6 For the avoidance of doubt and the purposes of the Grid Code, **DC Connected Power Park Modules** are treated as belonging to **Generators**. **Generators** who own **DC Connected Power Park Modules** would therefore be expected to supply the same data as required under this **PC** in respect of **Power Stations** comprising **Power Park Modules** other than where specific references to **DC Connected Power Park Modules** are made.

PC1.7 As defined in the Glossary and Definitions, **Electricity Storage Modules** are treated as belonging to **Storage User's** who are a subset of **Generator's. Generators** who own or operate **Electricity Storage Modules** would therefore be expected to supply the same data as required under this PC in respect of **Power Stations**. In general, and not withstanding the requirements of the Glossary and Definitions and the wider requirements specified in the **Planning Code, Generators** in respect of **Synchronous Electricity Storage Modules** would be expected to supply the same data as required from **Generators** in respect of **Synchronous Power Generating Modules** and **Generators** in respect of **Non-Synchronous Electricity Storage Modules** would be expected to supply the same data as required from **Generators** in respect of **Power Park Modules**.

PC.2 OBJECTIVE

PC.2.1 The objectives of the **PC** are:

(a) to promote **The Company/User** interaction in respect of any proposed development on the **User System** which may impact on the performance of the **National Electricity Transmission System** or the direct connection with the **National Electricity Transmission System**;

(b) to provide for the supply of information to **The Company** from **Users** in order that planning and development of the **National Electricity Transmission System** can be undertaken in accordance with the relevant **Licence Standards**, to facilitate existing and proposed connections, and also to provide for the supply of certain information from **The Company** to **Users** in relation to short circuit current contributions and **OTSUA**; and

(c) to specify the **Licence Standards** which will be used in the planning and development of the **National Electricity Transmission System**; and

(d) to provide for the supply of information required by **The Company** from **Users** in respect of the following to enable **The Company** to carry out its duties under the **Act** and the **ESO Licence**:

(i) **Mothballed Generating Units, Mothballed Power Generating Modules**; and

(ii) capability of gas-fired **Synchronous Power Generating Modules** or **Generating Units** to run using alternative fuels.

**The Company** will use the information provided under PC.2.1(d) in providing reports to the **Authority** and the **Secretary of State** and, where directed by the **Authority** or the **Secretary of State** to do so, **The Company** may publish the information. Where it is known by **The Company** that such information is intended for wider publication the information provided under PC.2.1(d) shall be aggregated such that individual data items should not be identifiable.

(e) in the case of **OTSUA**:

(i) to specify the minimum technical and design criteria and procedures to be applied by **Users** in the planning and development of **OTSUA**; and thereby

(ii) to ensure that the **OTSUA** can from the **OTSUA Transfer Time** be operated as part of the **National Electricity Transmission System**; and

(iii) to provide for the arrangements and supply of information and data between **The Company** and a **User** to ensure that the **User** is able to undertake **OTSDUW**; and

(iv) to promote **The Company/User** interaction and co-ordination in respect of any

proposed development on the **National Electricity Transmission System** or the **OTSUA**, which may impact on the **OTSUA** or (as the case may be) the **National Electricity Transmission System**.

PC.3 SCOPE

PC.3.1 The **PC** applies to **The Company** and to **Users**, which in the **PC** means:

(a) **Generators**;

(b) **Generators** undertaking **OTSDUW**;

(c) **Network Operators**;

(d) **Non-Embedded Customers**;

(e) **DC Converter Station** owners; and

(f) **HVDC System Owners**.

The above categories of **User** will become bound by the **PC** prior to them generating, operating, or consuming or importing/exporting, as the case may be, and references to the various categories (or to the general category) of **User** should, therefore, be taken as referring to them in that prospective role as well as to **Users** actually connected.

PC.3.2 In the case of **Embedded Power Station**s, **Embedded DC Converter Stations** and **Embedded HVDC Systems**, unless provided otherwise, the following provisions apply with regard to the provision of data under this **PC**:

(a) each **Generator** shall provide the data direct to **The Company** in respect of (i) **Embedded Large Power Stations**, (ii) **Embedded Medium Power Stations** subject to a **Bilateral Agreement** and (iii) **Embedded Small Power Stations** which form part of a **Cascade Hydro Scheme**;

(b) each **DC Converter** owner or **HVDC System Owner** shall provide the data direct to **The Company** in respect of **Embedded DC Converter Stations** and **Embedded HVDC Systems** subject to a **Bilateral Agreement**;

(c) each **Network Operator** shall provide the data to **The Company** in respect of each **Embedded Medium Power Station** not subject to a **Bilateral Agreement** or **Embedded DC Converter Station** not subject to a **Bilateral Agreement** or **Embedded HVDC System** not subject to a **Bilateral Agreement** connected, or proposed to be connected within such **Network Operator's System**;

(d) although data is not normally required specifically on **Embedded Small Power Stations** or on **Embedded** installations of direct current converters which do not form a **DC Converter Station** or **HVDC System** under this **PC**, each **Network Operator** in whose **System** they are **Embedded** should provide the data (contained in the Appendix) to **The Company** in respect of **Embedded Small Power Stations** or **Embedded** installations of direct current converters which do not form a **DC Converter Station** or **Embedded** installations of **HVDC Systems** if:

(i) it falls to be supplied pursuant to the application for a **CUSC Contract** or in the **Statement of Readiness** to be supplied in connection with a **Bilateral Agreement** and/or **Construction Agreement**, by the **Network Operator**; or

(ii) it is specifically requested by **The Company** in the circumstances provided for under this **PC**.

PC.3.3 Certain data does not normally need to be provided in respect of certain **Embedded Power Stations**, **Embedded DC Converter Stations** or **Embedded HVDC Systems**, as provided in PC.A.1.12.

In summary, **Network Operators** are required to supply the following data in respect of **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** or **Embedded DC Converter Stations** not subject to a **Bilateral Agreement** or **Embedded HVDC Systems** not subject to a **Bilateral Agreement** connected, or is proposed to be connected, within such **Network Operator's System**:

PC.A.2.1.1

PC.A.2.2.2

PC.A.2.5.5.2

PC.A.2.5.5.7

PC.A.2.5.6

PC.A.3.1.5

PC.A.3.2.2

PC.A.3.3.1

PC.A.3.4.1

PC.A.3.4.2

PC.A.5.2.2

PC.A.5.3.2

PC.A.5.4

PC.A.5.5.1

PC.A.5.6

For the avoidance of doubt **Network Operators** are required to supply the above data in respect of **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded DC Converter Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Systems** not subject to a **Bilateral Agreement** which are located **Offshore** and which are connected or proposed to be connected within such **Network Operator's System**. This is because **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded DC Converter Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Systems** not subject to a **Bilateral Agreement** are treated as **Onshore Generators** or **Onshore DC Converter Station** owners or **HVDC System Owners** connected to an **Onshore User System Entry Point**.

PC.3.4 **The Company** may provide to the **Relevant Transmission Licensees** any data which has been submitted to **The Company** by any **Users** pursuant to the following paragraphs of the **PC**. For the avoidance of doubt, **The Company** will not provide to the **Relevant Transmission Licensees**, the types of data specified in Appendix D. The **Relevant Transmission Licensees'** use of such data is detailed in the **STC**.

PC.A.2.2

PC.A.2.5

PC.A.3.1

PC.A.3.2.1

PC.A.3.2.2

PC.A.3.3

PC.A.3.4

PC.A.4

PC.A.5.1

PC.A.5.2

PC.A.5.3.1

PC.A.5.3.2

PC.A.5.4.1

PC.A.5.4.2

PC.A.5.4.3.1

PC.A.5.4.3.2

PC.A.5.4.3.3

PC.A.5.4.3.4

PC.A.7

(and in addition in respect of the data submitted in respect of the **OTSUA**)

PC.A.2.2

PC.A.2.3

PC.A.2.4

PC.A.2.5

PC.A.3.2.2

PC.A.3.3.1(d)

PC.A.4

PC.A.5.4.3.1

PC.A.5.4.3.2

PC.A.6.2

PC.A.6.3

PC.A.6.4

PC.A.6.5

PC.A.6.6

PC.A.7

PC.3.5 In addition to the provisions of PC.3.4, **The Company** may provide to the **Relevant Transmission Licensees** any data which has been submitted to **The Company** by any **Users** in respect of **Relevant Units** pursuant to the following paragraphs of the **PC**.

PC.A.2.3

PC.A.2.4

PC.A.5.5

PC.A.5.7

PC.A.6.2

PC.A.6.3

PC.A.6.4

PC.A.6.5

PC.A.6.6

PC.3.6 In the case of **Offshore Embedded Power Stations** connected to an **Offshore User System** which directly connects to an **Offshore Transmission System**, any additional data requirements in respect of such **Offshore Embedded Power Stations** may be specified in the relevant **Bilateral Agreement** with the **Network Operator** or in any **Bilateral Agreement** between **The Company** and such **Offshore Embedded Power Station**.

PC.3.7 In the case of a **Generator** undertaking **OTSDUW** connecting to an **Onshore Network Operator's System**, any additional requirements in respect of such **OTSDUW Plant and Apparatus** will be specified in the relevant **Bilateral Agreement** with the **Generator**. For the avoidance of doubt, requirements applicable to **Generators** undertaking **OTSDUW** and connecting to a **Network Operator's User System**, shall be consistent with those applicable requirements of **Generators** undertaking **OTSDUW** and connecting to a **Transmission Interface Point**.

PC.3.8 For the purpose of complying with the requirements of ECC.6.3.17.1.5 and ECC.6.3.17.2.3 **The Company** may share relevant modelling information to a **User** based on the following information submitted by a **User** to **The Company**:

PC.A.5.3.2(a), (b), (c), (d) and (g)

PC.A.5.4.2

PC.A.5.4.3

PC.A.9

PC.3.9 A **User** who recieves information from **The Company** under PC.3.8 may only use the information to complete the analysis required by ECC.6.3.17.1 and EEC.6.3.17.2 as applicable and the **Bilateral Agreement.** Further conditions on the sharing of models are detailed in PC.A.9

PC.4 PLANNING PROCEDURES

PC.4.1 Pursuant to Condition C12 of the **ESO Licence**, the means by which **Users** and proposed **Users** of the **National Electricity Transmission System** are able to assess opportunities for connecting to, and using, the **National Electricity Transmission System** comprise two distinct parts, namely:

(a) a statement, prepared by **The Company** in accordance with standard condition C12of its **ESO Licence**, showing for the current **Financial Year** and each of the nine succeeding **Financial Years**, the opportunities available for connecting to and using the **National Electricity Transmission System** and indicating those parts of the **National Electricity Transmission System** most suited to new connections and transport of further quantities of electricity (the "**Electricity Ten Year Statement**" or **ETYS**); and

(b) an offer, in accordance with its **ESO Licence**, by **The Company** to enter into a **CUSC Contract**. A **Bilateral Agreement** is to be entered into for every **Connection Site** (and for certain **Embedded Power Stations** and **Embedded DC Converter Stations** and **Embedded HVDC Systems**) within the first two of the following categories and the existing **Bilateral Agreement** may be required to be varied in the case of the third category:

(i) existing **Connection Sites** (and for certain **Embedded Power Stations**) as at the **Transfer Date**;

(ii) new Connection **Sites** (and for certain **Embedded Power Stations**, **Embedded DC Converter Stations** and **Embedded HVDC Systems**) with effect from the **Transfer Date**;

(iii) a **Modification** at a **Connection Site** (or in relation to the connection of certain **Embedded Power Stations**, **Embedded DC Converter Stations** and **Embedded HVDC Systems** whether or not the subject of a **Bilateral Agreement**) (whether such **Connection Site** or connection exists on the **Transfer Date** or is new thereafter) with effect from the **Transfer Date**.

In this **PC**, unless the context otherwise requires, "connection" means any of these 3 categories.

PC.4.2 Introduction to Data

User Data

PC.4.2.1 Under the **PC**, two types of data to be supplied by **Users** are called for:

(a) **Standard Planning Data**; and

(b) **Detailed Planning Data**,

as more particularly provided in PC.A.1.4.

PC.4.2.2 The **PC** recognises that these two types of data, namely **Standard Planning Data** and **Detailed Planning Data**, are considered at three different levels:

(a) **Preliminary Project Planning Data**;

(b) **Committed Project Planning Data**; and

(c) **Connected Planning Data**,

as more particularly provided in PC.5

PC.4.2.3 **Connected Planning Data** is itself divided into:

(a) **Forecast Data**;

(b) **Registered Data**; and

(c) **Estimated Registered Data**,

as more particularly provided in PC.5.5

PC.4.2.4 Clearly, an existing **User** proposing a new **Connection Site** (or **Embedded Power Station** or **Embedded DC Converter Station** or **Embedded HVDC System**) in the circumstances outlined in PC.4.1) will need to supply data both in an application for a **Bilateral Agreement** and under the **PC** in relation to that proposed new **Connection Site** (or **Embedded Power Station** or **Embedded DC Converter Station** or **Embedded HVDC System** in the circumstances outlined in PC.4.1) and that will be treated as **Preliminary Project Planning Data** or **Committed Project Planning Data** (as the case may be), but the data it supplies under the **PC** relating to its existing **Connection Sites** will be treated as **Connected Planning Data**.

Network Data

PC.4.2.5 In addition, there is **Network Data** supplied by **The Company** in relation to short circuit current contributions and in relation to **OTSUA**.

PC.4.3 Data Provision

PC.4.3.1 **Electricity Ten Year Statement**

To enable the **Electricity Ten Year Statement** to be prepared, each **User** is required to submit to **The Company** (subject to the provisions relating to **Embedded Power Stations** and **Embedded DC Converter Stations** and **Embedded HVDC Systems** in PC.3.2) both the **Standard Planning Data** and the **Detailed Planning Data** as listed in parts l and 2 of the Appendix. This data should be submitted in calendar week 24 of each year (although **Network Operators** may delay the submission of data (other than that to be submitted pursuant to PC.3.2(c) and PC.3.2(d)) until calendar week 28) and should cover the current **Financial Year and** each of the nine succeeding **Financial Years** Where, from the date of one submission to another, there is no change in the data (or in some of the data) to be submitted, instead of re-submitting the data, a **User** may submit a written statement that there has been no change from the data (or in some of the data) submitted the previous time. In addition, **The Company** will also use the **Transmission Entry Capacity** and **Connection Entry Capacity** data from the **CUSC Contract**, and any data submitted by **Network Operators** in relation to an **Embedded Medium Power Station** not subject to a **Bilateral Agreement** or **Embedded DC Converter Station** not subject to a **Bilateral Agreement**, or **Embedded HVDC System** not subject to a **Bilateral Agreement** in the preparation of the **Electricity Ten Year Statement** and to that extent the data will not be treated as confidential.

PC.4.3.2 Network Data

To enable **Users** to model the **National Electricity Transmission System** in relation to short circuit current contributions, **The Company** is required to submit to **Users**, the **Network Data** as listed in Part 3 of the Appendix. The data will be submitted in week 42 of each year and will cover that **Financial Year**.

PC.4.3.3 To enable **Users** to model the **National Electricity Transmission System** in relation to **OTSUA**, **The Company** is required to submit to **Users** the **Network Data**, as listed in Part 3 of Appendix A and Appendix F. **The Company** shall provide the **Network Data** with the offer of a **CUSC Contract** in the case of the data in PC F2.1 and otherwise in accordance with the **OTSDUW Development and Data Timetable**.

PC.4.4 Offer of Terms for Connection

PC.4.4.1 CUSC Contract – Data Requirements/Offer Timing

The completed application form for a **CUSC Contract** to be submitted by a **User** when making an application for a **CUSC Contract** will include:

(a) a description of the **Plant** and/or **Apparatus** (excluding **OTSDUW Plant and Apparatus**) to be connected to the **National Electricity Transmission System** or of the **Modification** relating to the **User's Plant** and/or **Apparatus** (and prior to the **OTSUA Transfer Time**, any **OTSUA**) already connected to the **National Electricity Transmission System** or, as the case may be, of the proposed new connection or **Modification** to the connection within the **User System** of the **User**, each of which shall be termed a "**User Development**" in the **PC**;

(b) the relevant **Standard Planning Data** as listed in Part 1 of the Appendix (except in respect of any **OTSUA**); and

(c) the desired **Completion Date** of the proposed **User Development**.

(d) the desired **Connection Entry Capacity** and **Transmission Entry Capacity**.

The completed application form for a **CUSC Contract** will be sent to **The Company** as more particularly provided in the application form.

PC.4.4.2 Any offer of a **CUSC Contract** will provide that it must be accepted by the applicant **User** within the period stated in the offer, after which the offer automatically lapses. Except as provided in the **CUSC Contract**, acceptance of the offer renders the **National Electricity Transmission System** works relating to that **User Development**, reflected in the offer, committed and binds both parties to the terms of the offer. The User shall then provide the **Detailed Planning Data** as listed in Part 2 of the Appendix (and in the case of **OTSUA** the **Standard Planning Data** as listed in Part 1 of Appendix A within the timeline provided in PC.A.1.4). In respect of **DPD I** this shall generally be provided within 28 days (or such shorter period as **The Company** may determine, or such longer period as **The Company** may agree, in any particular case) of acceptance of the offer and in respect of **DPD II** this shall generally be provided at least two years (or such longer period as **The Company** may determine, or such shorter period as **The Company** may agree, in any particular case or in the case of **OTSUA** such shorter period as **The Company** shall require) prior to the **Completion Date** of the **User Development**.

PC.4.4.3 Embedded Development Agreement - Data Requirements

The **Network Operator** shall submit the following data in relation to an **Embedded Medium Power Station** not subject to, or proposed to be subject to, a **Bilateral Agreement** or **Embedded DC Converter Station** not subject to, or proposed to be subject to, a **Bilateral Agreement** as soon as reasonably practicable after receipt of an application from an **Embedded Person** to connect to its **System**:

(a) details of the proposed new connection or variation (having a similar effect on the **Network Operator's System** as a **Modification** would have on the **National Electricity Transmission System**) to the connection within the **Network Operator's System**, each of which shall be termed an "**Embedded Development**" in the **PC** (where a **User Development** has an impact on the **Network Operator's System** details shall be supplied in accordance with PC.4.4 and PC.4.5);

(b) the relevant **Standard Planning Data** as listed in Part 1 of the Appendix;

(c) the proposed completion date (having a similar meaning in relation to the **Network Operator's System** as **Completion Date** would have in relation to the **National Electricity Transmission System**) of the **Embedded Development**; and

(d) upon the request of **The Company**, the relevant **Detailed Planning Data** as listed in Part 2 of the Appendix.

PC.4.4.4 The **Network Operator** shall provide the **Detailed Planning Data** as listed in Part 2 of the Appendix. In respect of **DPD I**, this shall generally be provided within 28 days (or such shorter period as **The Company** may determine, or such longer period as **The Company** may agree, in any particular case) of entry into the **Embedded Development Agreement** and in respect to **DPD II** this shall generally be provided at least two years (or such longer period as **The Company** may determine, or such shorter period as **The Company** may agree, in any particular case) prior to the **Completion Date** of the **Embedded Development**.

PC.4.5 Complex Connections

PC.4.5.1 The magnitude and complexity of any **National Electricity Transmission System** extension or reinforcement will vary according to the nature, location and timing of the proposed **User Development** which is the subject of the application and it may, in the event, be necessary for **The Company** to carry out additional more extensive system studies to evaluate more fully the impact of the proposed **User Development** on the **National Electricity Transmission System**. Where **The Company** judges that such additional more detailed studies are necessary the offer may indicate the areas that require more detailed analysis and before such additional studies are required, the **User** shall indicate whether it wishes **The Company** to undertake the work necessary to proceed to make a revised offer within the 3 month period normally allowed or, where relevant, the timescale consented to by the **Authority**.

PC.4.5.2 To enable **The Company** to carry out any of the above mentioned necessary detailed system studies, the **User** may, at the request of **The Company**, be required to provide some or all of the **Detailed Planning Data** listed in part 2 of the Appendix in advance of the normal timescale referred in PC.4.4.2 provided that **The Company** can reasonably demonstrate that it is relevant and necessary.

PC.4.5.3 To enable **The Company** to carry out any necessary detailed system studies, the relevant **Network Operator** may, at the request of **The Company**, be required to provide some or all of the **Detailed Planning Data** listed in Part 2 of the Appendix in advance of the normal timescale referred in PC.4.4.4 provided that **The Company** can reasonably demonstrate that it is relevant and necessary.

## PC.5 PLANNING DATA

PC.5.1 As far as the **PC** is concerned, there are three relevant levels of data in relation to **Users**. These levels, which relate to levels of confidentiality, commitment and validation, are described in the following paragraphs.

### Preliminary Project Planning Data

PC.5.2 At the time the **User** applies for a **CUSC Contract** but before an offer is made and accepted by the applicant **User**, the data relating to the proposed **User Development** will be considered as **Preliminary Project Planning Data**. Data relating to an **Embedded Development** provided by a **Network Operator** in accordance with PC.4.4.3, and PC.4.4.4 if requested, will be considered as **Preliminary Project Planning Data**. All such data will be treated as confidential within the scope of the provisions relating to confidentiality in the **CUSC**.

PC.5.3 **Preliminary Project Planning Data** will normally only contain the **Standard Planning Data** unless the **Detailed Planning Data** is required in advance of the normal timescale to enable **The Company** to carry out additional detailed system studies as described in PC.4.5.

### Committed Project Planning Data

PC.5.4 Once the offer for a **CUSC Contract** is accepted, the data relating to the **User Development** already submitted as **Preliminary Project Planning Data**, and subsequent data required by **The Company** under this **PC**, will become **Committed Project Planning Data**. Once an **Embedded Person** has entered into an **Embedded Development Agreement**, as notified to **The Company** by the **Network Operator**, the data relating to the **Embedded Development** already submitted as **Preliminary Project Planning Data**, and subsequent data required by **The Company** under the **PC**, will become **Committed Project Planning Data**. Such data, together with **Connection Entry Capacity** and **Transmission Entry Capacity** data from the **CUSC Contract** and other data held by **The Company** relating to the **National Electricity Transmission System** will form the background against which new applications by any **User** will be considered and against which planning of the **National Electricity Transmission System** will be undertaken. Accordingly, **Committed Project Planning Data**, **Connection Entry Capacity** and **Transmission Entry Capacity** data will not be treated as confidential to the extent that **The Company**:

(a) is obliged to use it in the preparation of the **Electricity Ten Year Statement** and in any further information given pursuant to the **Electricity Ten Year Statement**;

(b) is obliged to use it when considering and/or advising on applications (or possible applications) of other **Users** (including making use of it by giving data from it, both orally and in writing, to other **Users** making an application (or considering or discussing a possible application) which is, in **The Company's** view, relevant to that other application or possible application);

(c) is obliged to use it for operational planning purposes;

(d) is obliged under the terms of an **Interconnection Agreement** to pass it on as part of system information on the **Total System**;

(e) is obliged to disclose it under the **STC**;

(f) is obliged to use and disclose it in the preparation of the **Offshore Development Information Statement**;

(g) is obliged to use it in order to carry out its **EMR Functions** or is obliged to disclose it under an **EMR Document**.

To reflect different types of data, **Preliminary Project Planning Data** and **Committed Project Planning Data** are themselves divided into:

(a) those items of **Standard Planning Data** and **Detailed Planning Data** which will always be forecast, known as **Forecast Data**; and

(b) those items of **Standard Planning Data** and **Detailed Planning Data** which relate to **Plant** and/or **Apparatus** which upon connection will become **Registered Data**, but which prior to connection, for the current **Financial Year** and the nine succeeding **Financial Years**, will be an estimate of what is expected, known as **Estimated Registered Data**.

Connected Planning Data

PC.5.5 The **PC** requires that, at the time that a **Statement of Readiness** is submitted under the **Bilateral Agreement** and/or **Construction Agreement**, any estimated values assumed for planning purposes are confirmed or, where practical, replaced by validated actual values and by updated estimates for the future and by updated forecasts for forecast data items such as **Demand**. In the case of an **Embedded Development** the relevant **Network Operator** will update any estimated values assumed for planning purposes with validated actual values as soon as reasonably practicable after energisation. This data is then termed **Connected Planning Data**.

To reflect the three types of data referred to above, **Connected Planning Data** is itself divided into:

(a) those items of **Standard Planning Data** and **Detailed Planning Data** which will always be forecast data, known as **Forecast Data**; and

(b) those items of **Standard Planning Data** and **Detailed Planning Data** which upon connection become fixed (subject to any subsequent changes), known as **Registered Data**; and

(c) those items of **Standard Planning Data** and **Detailed Planning Data** which for the purposes of the **Plant** and/or **Apparatus** concerned as at the date of submission are **Registered Data** but which for the current **Financial Year** and nine succeeding **Financial Years** will be an estimate of what is expected, known as **Estimated Registered Data**,

as more particularly provided in the Appendix.

PC.5.6 **Connected Planning Data**, together with **Connection Entry Capacity** and **Transmission Entry Capacity** data from the **CUSC Contract**, and other data held by **The Company** relating to the **National Electricity Transmission System**, will form the background against which new applications by any **User** will be considered and against which planning of the **National Electricity Transmission System** will be undertaken. Accordingly, **Connected Planning Data**, **Connection Entry Capacity** and **Transmission Entry Capacity** data will not be treated as confidential to the extent that **The Company**:

(a) is obliged to use it in the preparation of the **Electricity Ten Year Statement** and in any further information given pursuant to the **Electricity Ten Year Statement**;

(b) is obliged to use it when considering and/or advising on applications (or possible applications) of other **Users** (including making use of it by giving data from it, both orally and in writing, to other **Users** making an application (or considering or discussing a possible application) which is, in **The Company's** view, relevant to that other application or possible application);

(c) is obliged to use it for operational planning purposes;

(d) is obliged under the terms of an **Interconnection Agreement** to pass it on as part of system information on the **Total System**.

(e) is obliged to disclose it under the **STC**;

(f) is obliged to use it in order to carry out its **EMR Functions** or is obliged to disclose it under an **EMR Document**.

PC.5.7 **Committed Project Planning Data** and **Connected Planning Data** will each contain both **Standard Planning Data** and **Detailed Planning Data**.

PC.6 PLANNING STANDARDS

PC.6.1 **The Company** shall apply the **Licence Standards** relevant to it in the planning and development of the **National Electricity Transmission System**. **The Company** shall procure that each **Relevant Transmission Licensee** shall apply the **Licence Standards** relevant to planning and development, in the planning and development of the **Transmission System** of each **Relevant Transmission Licensee** and that a **User** shall apply the **Licence Standards** relevant to planning and development, in the planning and development of the **OTSUA**.

PC.6.2 In relation to Scotland, Appendix C lists the technical and design criteria applied in the planning and development of each **Relevant Transmission Licensee's Transmission System**. The criteria are subject to review in accordance with each **Relevant Transmission Licensee's Transmission Licence** conditions. Copies of these documents are available from **The Company** on request. **The Company** will charge an amount sufficient to recover its reasonable costs incurred in providing this service.

PC.6.3 In relation to **Offshore**, Appendix E lists the technical and design criteria applied in the planning and development of each **Offshore Transmission System**. The criteria are subject to review in accordance with each **Offshore Transmission Licensee's Transmission Licence** conditions. Copies of these documents are available from **The Company** on request. **The Company** will charge an amount sufficient to recover its reasonable costs incurred in providing this service.

PC.6.4 In planning and developing the **OTSUA**, the **User** shall comply with (and shall ensure that (as at the **OTSUA Transfer Time**) the **OTSUA** comply with):

(a) the **Licence Standards**; and

(b) the technical and design criteria in Appendix E.

PC.6.5 In addition the **User** shall, in the planning and development of the **OTSUA**, to the extent it is reasonable and practicable to do so, take into account the reasonable requests of **The Company** (in the context of its obligation to develop an efficient, co-ordinated and economical system) relating to the planning and development of the **National Electricity Transmission System**.

PC.6.6 In planning and developing the **OTSUA** the **User** shall take into account the **Network Data** provided to it by **The Company** under Part 3 of Appendix A and Appendix F, and act on the basis that the **Plant** and **Apparatus** of other **Users** complies with:

(a) the minimum technical design and operational criteria and performance requirements set out in either CC.6.1, CC.6.2, CC.6.3 and CC.6.4 or ECC.6.1, ECC.6.2, ECC.6.3 and ECC.6.4 ; or

(b) such other criteria or requirements as **The Company** may from time to time notify the **User** are applicable to specified **Plant** and **Apparatus** pursuant to PC.6.7.

PC.6.7 Where the **OTSUA** are likely to be materially affected by the design or operation of another **User's Plant** and **Apparatus** and **The Company**:

(a) becomes aware that such other **User** has or is likely to apply for a derogation under the Grid Code;

(b) is itself applying for a derogation under the Grid Code in relation to the **Connection Site** on which such other **User's Plant** and **Apparatus** is located or to which it otherwise relates; or

(c) is otherwise notified by such other **User** that specified **Plant** or **Apparatus** is normally capable of operating at levels better than those set out in CC.6.1, CC.6.2, CC.6.3 and CC.6.4 or ECC.6.1, ECC.6.2, ECC.6.3 and ECC.6.4,

**The Company** shall notify the **User**.

PC.7 PLANNING LIAISON

PC.7.1 This PC.7 applies to **The Company** and **Users**, which in PC.7 means

(a) **Network Operators**

(b) **Non-Embedded Customers**

PC.7.2 As described in PC.2.1 (b) an objective of the **PC** is to provide for the supply of information to **The Company** by **Users** in order that planning and development of the **National Electricity Transmission System** can be undertaken in accordance with the relevant **Licence Standards**.

PC.7.3 **Grid Code** amendment B/07 ("Amendment B/07") implemented changes to the **Grid Code** which included amendments to the datasets provided by both **The Company** and **Users** to inform the planning and development of the **National Electricity Transmission System**. The **Authority** has determined that these changes are to have a phased implementation. Consequently the provisions of Appendix A to the **PC** include specific years (ranging from 2009 to 2011) with effect from which certain of the specific additional obligations brought about by Amendment B/07 on **The Company** and **Users** are to take effect. Where specific provisions of paragraphs PC.A.4.1.4, PC.A.4.2.2 and PC.A.4.3.1 make reference to a year, then the obligation on **The Company** and the **Users** shall be required to be met by the relevant calendar week (as specified within such provision) in such year.

In addition to the phased implementation of aspects of Amendment B/07, **Users** must discuss and agree with **The Company** by no later than 31 March 2009 a more detailed implementation programme to facilitate the implementation of **Grid Code** amendment B/07.

It shall also be noted by **The Company** and **Users** that the dates set out in PC.A.4 are intended to be minimum requirements and are not intended to restrict a **User** and **The Company** from the earlier fulfilment of the new requirements prior to the specified years. Where **The Company** and a **User** wish to follow the new requirements from earlier dates than those specified, this will be set out in the more detailed implementation programme agreed between **The Company** and the **User**.

The following provisions of PC.7 shall only apply with effect from 1 January 2011.

PC.7.4 Following the submission of data by a **User** in or after week 24 of each year **The Company** will provide information to **Users** by calendar week 6 of the following year regarding the results of any relevant assessment that has been made by **The Company** based upon such data submissions to verify whether **Connection Points** are compliant with the relevant **Licence Standards**.

PC.7.5 Where the result of any assessment identifies possible future non-compliance with the relevant **Licence Standards**, **The Company** shall notify the relevant **User(s)** of this fact as soon as reasonably practicable and shall agree with **Users** any opportunity to resubmit data to allow for a reassessment in accordance with PC.7.6.

PC.7.6 Following any notification by **The Company** to a **User** pursuant to PC.7.5 and following any further discussions held between the **User** and **The Company**:

(i) **The Company** and the **User** may agree revisions to the **Access Periods** for relevant **Transmission Interface Circuits**, such revisions shall not however permit an **Access Period** to be less than 4 continuous weeks in duration or to occur other than between calendar weeks 10 and 43 (inclusive); and/or,

(ii) The **User** shall as soon as reasonably practicable

(a) submit further relevant data to **The Company** that is to **The Company's** reasonable satisfaction; and/or,

(b) modify data previously submitted pursuant to this **PC**, such modified data to be to **The Company's** reasonable satisfaction; and/or

(c) notify **The Company** that it is the intention of the **User** to leave the data as originally submitted to **The Company** to stand as its submission.

PC.7.7 Where an **Access Period** is amended pursuant to PC.7.6 (i) **The Company** shall notify **The Authority** that it has been necessary to do so.

PC.7.8 When it is agreed that any resubmission of data is unlikely to confirm future compliance with the relevant **Licence Standards** the **Modification** process in the **CUSC** may apply.

PC.7.9 A **User** may at any time, in writing, request further specified **National Electricity Transmission System** network data in order to provide **The Company** with viable **User** network data (as required under this **PC**). Upon receipt of such request, **The Company** shall consider, and where appropriate provide such **National Electricity Transmission System** network data to the **User** as soon as reasonably practicable following the request.

PC.8 OTSDUW PLANNING LIAISON

PC.8.1 This PC.8 applies to **The Company** and **Users**, which in PC.8 means **Users** undertaking **OTSDUW**

PC.8.2 As described in PC.2.1 (e) an objective of the **PC** is to provide for the supply of information between **The Company** and a **User** undertaking **OTSDUW** in order that planning and development of the **National Electricity Transmission System** can be co-ordinated.

PC.8.3 Where the **OTSUA** also require works to be undertaken by any **Relevant Transmission Licensee** on its **Transmission System The Company** and the **User** shall throughout the construction and commissioning of such works:

(a) co-operate and assist each other in the development of co-ordinated construction programmes or any other planning or, in the case of **The Company**, analysis it undertakes in respect of the works; and

(b) provide to each other all information relating to, in the case of the **User** its own works and, in the case of **The Company,** the works on the **Transmission Systems** reasonably necessary to assist each other in the performance of that other's part of the works, and shall use all reasonable endeavours to co-ordinate and integrate their respective part of the works; and

the **User** shall plan and develop the **OTSUA**, taking into account to the extent that it is reasonable and practicable to do so the reasonable requests of **The Company** relating to the planning and development of the **National Electricity Transmission System**.

PC.8.4 Where **The Company** becomes aware that changes made to the investment plans of any **Relevant Transmission Licensee** may have a material effect on the **OTSUA**, **The Company** shall notify the **User** and provide the **User** with the necessary information about the relevant **Transmission Systems** sufficient for the **User** to assess the impact on the **OTSUA**.

## APPENDIX A - PLANNING DATA REQUIREMENTS

PC.A.1 INTRODUCTION

PC.A.1.1 The Appendix specifies data requirements to be submitted to **The Company** by **Users**, and in certain circumstances to **Users** by **The Company**.

PC.A.1.2 Submissions by Users

(a) Planning data submissions by **Users** shall be:

(i) with respect to the current **Financial Year** and each of the nine succeeding **Financial Years** (other than in the case of **Registered Data** which will reflect the current position and data relating to **Demand** forecasts which relates also to the current year);

(ii) provided by **Users** in connection with a **CUSC Contract** (PC.4.1, PC.4.4 and PC.4.5 refer);

(iii) provided by **Users** on a routine annual basis in calendar week 24 of each year to maintain an up-to-date data bank (although **Network Operators** may delay the submission of data (other than that to be submitted pursuant to PC.3.2(c) and PC.3.2(d)) until calendar week 28). In addition the structural data in DRC Schedule 5 Tables 5(a), 5(b), 5(d), 5(e) , 5(f) and DRC Schedule 13 (Lumped system susceptance (PC.A.2.3) only) provided by **Network Operators** by calendar week 28 shall be updated by calendar week 50 of each year (again which may be delayed as above until week 2 of the following calendar year). Where from the date of one annual (or in the case of Schedule 5 or Schedule 13 the calendar week 50) submission to another there is no change in the data (or in some of the data) to be submitted, instead of re-submitting the data, a **User** may submit a written statement that there has been no change from the data (or some of the data) submitted the previous time; and

(iv) provided by **Network Operators** in connection with **Embedded Development** (PC.4.4 refers).

(b) Where there is any change (or anticipated change) in **Committed Project Planning Data** or a significant change in **Connected Planning Data** in the category of **Forecast Data** or any change (or anticipated change) in **Connected Planning Data** in the categories of **Registered Data** or **Estimated Registered Data** supplied to **The Company** under the **PC**, notwithstanding that the change may subsequently be notified to **The Company** under the **PC** as part of the routine annual update of data (or that the change may be a **Modification** under the **CUSC**), the **User** shall, subject to PC.A.3.2.3 and PC.A.3.2.4, notify **The Company** in writing without delay.

(c) The notification of the change will be in the form required under this **PC** in relation to the supply of that data and will also contain the following information:

(i) the time and date at which the change became, or is expected to become, effective;

(ii) if the change is only temporary, an estimate of the time and date at which the data will revert to the previous registered form.

(d) The routine annual update of data, referred to in (a)(iii) above, need not be submitted in respect of **Small Power Stations** or **Embedded** installations of direct current converters which do not form a **DC Converter Station** or **HVDC System** (except as provided in PC.3.2.(c)), or unless specifically requested by **The Company**, or unless otherwise specifically provided.

PC.A.1.3 Submissions by The Company

**Network Data** release by **The Company** shall be:

(a) with respect to the current **Financial Year**;

(b) provided by **The Company** on a routine annual basis in calendar week 42 of each year. Where from the date of one annual submission to another there is no change in the data (or in some of the data) to be released, instead of repeating the data, **The Company** may release a written statement that there has been no change from the data (or some of the data) released the previous time.

The three parts of the Appendix

PC.A.1.4 The data requirements listed in this Appendix are subdivided into the following four parts:

(a) Standard Planning Data

This data (as listed in Part 1 of the Appendix) is first to be provided by a **User** at the time of an application for a **CUSC Contract** or in accordance with PC.4.4.3. It comprises data which is expected normally to be sufficient for **The Company** to investigate the impact on the **National Electricity Transmission System** of any **User Development** or **Embedded Development** associated with an application by the **User** for a **CUSC Contract**. **Users** should note that the term **Standard Planning Data** also includes the information referred to in PC.4.4.1.(a) and PC.4.4.3.(a). In the case of **OTSUA**, this data is first to be provided by a **User** in accordance with the time line in Appendix F.

(b) Detailed Planning Data

This data (as listed in Part 2 of the Appendix) includes both **DPD I** and **DPD II** and is to be provided in accordance with PC.4.4.2 and PC.4.4.4. It comprises additional, more detailed, data not normally expected to be required by **The Company** to investigate the impact on the **National Electricity Transmission System** of any **User Development** associated with an application by the **User** for a **CUSC Contract** or **Embedded Development Agreement**. **Users** and **Network Operators** in respect of **Embedded Developments** should note that the term **Detailed Planning Data** also includes **Operation Diagrams** and **Site Common Drawings** produced in accordance with the **CC** and **ECC**.

The **User** may, however, be required by **The Company** to provide the **Detailed Planning Data** in advance of the normal timescale before **The Company** can make an offer for a **CUSC Contract**, as explained in PC.4.5.

(c) Network Data

The data requirements for **The Company** in this Appendix are in Part 3.

(d) Offshore Transmission System (OTSDUW) Data

**Generators** who are undertaking **OTSDUW** are required to submit data in accordance with Appendix A as summarised in Schedule 18 of the **Data Registration Code**.

Forecast Data, Registered Data and Estimated Registered Data

PC.A.1.5 As explained in PC.5.4 and PC.5.5, **Planning Data** is divided into:

(i) those items of **Standard Planning Data** and **Detailed Planning Data** known as **Forecast Data**; and

(ii) those items of **Standard Planning Data** and **Detailed Planning Data** known as **Registered Data**; and

(iii) those items of **Standard Planning Data** and **Detailed Planning Data** known as **Estimated Registered Data**.

PC.A.1.6 The following paragraphs in this Appendix relate to **Forecast Data**:

3.2.2(b), (h), (i) and (j)

4.2.1

4.3.1

4.3.2

4.3.3

4.3.4

4.3.5

4.5

4.7.1

5.2.1

5.2.2

5.6.1

PC.A.1.7 The following paragraphs in this Appendix relate to **Registered Data** and **Estimated Registered Data**:

2.2.1

2.2.4

2.2.5

2.2.6

2.3.1

2.4.1

2.4.2

3.2.2(a), (c), (d), (e), (f), (g), (i)(part) and (j)

3.4.1

3.4.2

4.2.3

4.5(a)(i), (a)(iii), (b)(i) and (b)(iii)

4.6

5.3.2

5.4

5.4.2

5.4.3

5.5

5.6.3

6.2

6.3

PC.A.1.8 The data supplied under PC.A.3.3.1, although in the nature of **Registered Data**, is only supplied either upon application for a **CUSC Contract**, or in accordance with PC.4.4.3, and therefore does not fall to be **Registered Data**, but is **Estimated Registered Data**.

PC.A.1.9 **Forecast Data** must contain the **User's** best forecast of the data being forecast, acting as a reasonable and prudent **User** in all the circumstances.

PC.A.1.10 **Registered Data** must contain validated actual values, parameters or other information (as the case may be) which replace the estimated values, parameters or other information (as the case may be) which were given in relation to those data items when they were **Preliminary Project Planning Data** and **Committed Project Planning Data**, or in the case of changes, which replace earlier actual values, parameters or other information (as the case may be). Until amended pursuant to the Grid Code, these actual values, parameters or other information (as the case may be) will be the basis upon which the **National Electricity Transmission System** is planned, designed, built and operated in accordance with, amongst other things, the **Transmission Licence** and the **ESO Licence** the **STC** and the Grid Code, and on which **The Company** therefore relies. In following the processes set out in the **BC**, **The Company** will use the data which has been supplied to it under the **BC** and the data supplied under **OC2** in relation to **Gensets**, but the provision of such data will not alter the data supplied by **Users** under the **PC**, which may only be amended as provided in the **PC**.

PC.A.1.11 **Estimated Registered Data** must contain the **User's** best estimate of the values, parameters or other information (as the case may be), acting as a reasonable and prudent **User** in all the circumstances.

PC.A.1.12 Certain data does not need to be supplied in relation to **Embedded Power Stations** or **Embedded DC Converter Stations** or **Embedded HVDC Systems** where these are connected at a voltage level below the voltage level directly connected to the **National Electricity Transmission System** except in connection with a **CUSC Contract**, or unless specifically requested by **The Company**.

PC.A.1.13 In the case of **OTSUA**, Schedule 18 of the **Data Registration Code** shall be construed in such a manner as to achieve the intent of such provisions by reference to the **OTSUA** and the **Interface Point** and all **Connection Points**.

## PART 1 - STANDARD PLANNING DATA

PC.A.2 USER'S SYSTEM (AND OTSUA) DATA

PC.A.2.1 Introduction

PC.A.2.1.1 Each **User**, whether connected directly via an existing **Connection Point** to the **National Electricity Transmission System**, or seeking such a direct connection, or providing terms for connection of an **Offshore Transmission System** to its **User System** to **The Company**, shall provide **The Company** with data on its **User System** (and any **OTSUA**) which relates to the **Connection Site** (and in the case of **OTSUA**, the **Interface Point**) and/or which may have a system effect on the performance of the **National Electricity Transmission System**. Such data, current and forecast, is specified in PC.A.2.2 to PC.A.2.5. In addition each **Generator** in respect of its **Embedded Large Power Stations** and its **Embedded Medium Power Stations** subject to a **Bilateral Agreement** and each **Network Operator** in respect of **Embedded Medium Power Stations** within its **System** not subject to a **Bilateral Agreement** connected to the **Subtransmission System**, shall provide **The Company** with fault infeed data as specified in PC.A.2.5.5 and each **DC Converter** owner with **Embedded DC Converter Stations** subject to a **Bilateral Agreement** and **Embedded HVDC System Owner** subject to a **Bilateral Agreement**, or **Network Operator** in the case of **Embedded DC Converter Stations** not subject to a **Bilateral Agreement** or **Embedded HVDC Systems** not subject to a **Bilateral Agreement**, connected to the **Subtransmission System** shall provide **The Company** with fault infeed data as specified in PC.A.2.5.6.

PC.A.2.1.2 Each **User** must reflect the system effect at the **Connection Site(s)** of any third party **Embedded** within its **User System** whether existing or proposed.

PC.A.2.1.3 Although not itemised here, each **User** with an existing or proposed **Embedded Small Power Station**, **Embedded Medium Power Station**, **Embedded DC Converter Station or HVDC System** with a **Registered Capacity** of less than 100MW or an **Embedded** installation of direct current converters which does not form a **DC Converter Station** or **HVDC System** in its **User System** may, at **The Company's** reasonable discretion, be required to provide additional details relating to the **User's System** between the **Connection Site** and the existing or proposed **Embedded Small Power Station**, **Embedded Medium Power Station, Embedded DC Converter Station**, **Embedded HVDC System** or **Embedded** installation of direct current converters which does not form a **DC Converter Station** or **Embedded** installation which does not form an **HVDC System**.

PC.A.2.1.4 At **The Company's** reasonable request, additional data on the **User's System** (or **OTSUA**) will need to be supplied. Some of the possible reasons for such a request, and the data required, are given in PC.A.6.2, PC.A.6.4, PC.A.6.5 and PC.A.6.6.

PC.A.2.2 User's System (and OTSUA) Layout

PC.A.2.2.1 Each **User** shall provide a **Single Line Diagram**, depicting both its existing and proposed arrangement(s) of load current carrying **Apparatus** relating to both existing and proposed **Connection Points** (including in the case of **OTSUA**, **Interface Points**).

PC.A.2.2.2 The **Single Line Diagram** (three examples are shown in Appendix B) must include all parts of the **User System** operating at **Supergrid Voltage** throughout **Great Britain** and, in Scotland and **Offshore**, also all parts of the **User System** operating at 132kV or greater, and those parts of its **Subtransmission System** at any **Transmission Site**. In the case of **OTSDUW**, the **Single Line Diagram** must also include the **OTSUA**. In addition, the **Single Line Diagram** must include all parts of the **User's Subtransmission System** (and any **OTSUA**) throughout **Great Britain** operating at a voltage greater than 50kV, and, in Scotland and **Offshore**, also all parts of the **User's Subtransmission System** (and any **OTSUA**) operating at a voltage greater than 30kV, which, under either intact network or **Planned Outage** conditions:

(a) normally interconnects separate **Connection Points**, or busbars at a **Connection Point** which are normally run in separate sections; or

(b) connects **Embedded Large Power Stations**, or **Embedded Medium Power Stations**, or **Embedded DC Converter Stations**, or **Embedded HVDC Systems** or **Offshore Transmission Systems** connected to the **User's Subtransmission System**, to a **Connection Point** or **Interface Point**.

At the **User's** discretion, the **Single Line Diagram** can also contain additional details of the **User's Subtransmission System** (and any **OTSUA**) not already included above, and also details of the transformers connecting the **User's Subtransmission System** to a lower voltage. With **The Company's** agreement, the **Single Line Diagram** can also contain information about the **User's System** (and any **OTSUA**) at a voltage below the voltage of the **Subtransmission System**.

The **Single Line Diagram** for a **Power Park Module** (including **DC Connected Power Park Modules**) must include all parts of the System connecting generating equipment to the **Grid Entry Point** (or **User System Entry Point** if **Embedded**). As an alternative, the **User** may choose to submit a **Single Line Diagram** with the equipment between the equivalent **Power Park Unit** and the **Common Collection Busbar** reduced to an electrically equivalent network. The format for a **Single Line Diagram** for a **Power Park Module** (including **DC Connected Power Park Modules**) electrically equivalent system is shown in Appendix B.

The **Single Line Diagram** must include the points at which **Demand** data (provided under PC.A.4.3.4 and PC.A.4.3.5, or in the case of **Generators**, PC.A.5.) and fault infeed data (provided under PC.A.2.5) are supplied.

PC.A.2.2.3 The above-mentioned **Single Line Diagram** shall include:

(a) electrical circuitry (i.e. overhead lines, identifying which circuits are on the same towers, underground cables, power transformers, reactive compensation equipment and similar equipment); and

(b) substation names (in full or abbreviated form) with operating voltages.

In addition, for all load current carrying **Apparatus** operating at **Supergrid Voltage** throughout **Great Britain** and, in Scotland and **Offshore**, also at 132kV or greater, (and any **OTSUA**) the **Single Line Diagram** shall include:

(a) circuit breakers

(b) phasing arrangements.

PC.A.2.2.3.1 For the avoidance of doubt, the **Single Line Diagram** to be supplied is in addition to the **Operation Diagram** supplied pursuant to CC.7.4 or ECC.7.4.

PC.A.2.2.4 For each circuit shown on the **Single Line Diagram** provided under PC.A.2.2.1, each **User** shall provide the following details relating to that part of its **User System** and **OTSUA**:

Circuit Parameters:

Rated voltage (kV)

Operating voltage (kV)

Positive phase sequence reactance

Positive phase sequence resistance

Positive phase sequence susceptance

Zero phase sequence reactance (both self and mutual)

Zero phase sequence resistance (both self and mutual)

Zero phase sequence susceptance (both self and mutual)

In the case of a **Single Line Diagram** for a **Power Park Module** (including **DC Connected Power Park Modules**) electrically equivalent system the data should be on a 100MVA base. Depending on the equivalent system supplied an equivalent tap changer range may need to be supplied. Similarly mutual values, rated voltage and operating voltage may be inappropriate. Additionally in the case of **OTSUA**, seasonal maximum continuous ratings and circuit lengths are to be provided in addition to the data required under PC.A.2.2.4.

PC.A.2.2.5 For each transformer shown on the **Single Line Diagram** provided under PC.A.2.2.1, each **User** (including those undertaking **OTSDUW**) shall provide the following details:

Rated MVA

Voltage Ratio

Winding arrangement

Positive sequence reactance (max, min and nominal tap)

Positive sequence resistance (max, min and nominal tap)

Zero sequence reactance

PC.A.2.2.5.1. In addition, for all interconnecting transformers between the **User's Supergrid Voltage System** and the **User's Subtransmission System** throughout **Great Britain** and, in Scotland and **Offshore**, also for all interconnecting transformers operating at 132kV or greater between the **User's** System and the **User's Subtransmission System** (and any **OTSUA**) the **User** shall supply the following information:-

Tap changer range

Tap change step size

Tap changer type: on load or off circuit

Earthing method: Direct, resistance or reactance

Impedance (if not directly earthed )

PC.A.2.2.6 Each **User** shall supply the following information about the **User's** equipment installed at a **Transmission Site** (or in the case of **OTSUA**, all **OTSDUW Plant and Apparatus**):-

(a) Switchgear. For all circuit breakers:-

Rated voltage (kV)

Operating voltage (kV)

Rated 3-phase rms short-circuit breaking current, (kA)

Rated 1-phase rms short-circuit breaking current, (kA)

Rated 3-phase peak short-circuit making current, (kA)

Rated 1-phase peak short-circuit making current, (kA)

Rated rms continuous current (A)

DC time constant applied at testing of asymmetrical breaking abilities (secs)

In the case of **OTSDUW Plant and Apparatus** operating times for circuit breaker, **Protection**, trip relay and total operating time should be provided.

(b) Substation Infrastructure. For the substation infrastructure (including, but not limited to, switch disconnectors, disconnectors, current transformers, line traps, busbars, through bushings, etc):-

Rated 3-phase rms short-circuit withstand current (kA)

Rated 1-phase rms short-circuit withstand current (kA).

Rated 3-phase short-circuit peak withstand current (kA)

Rated 1- phase short-circuit peak withstand current (kA)

Rated duration of short circuit withstand (secs)

Rated rms continuous current (A)

A single value for the entire substation may be supplied, provided it represents the most restrictive item of current carrying apparatus.

PC.A.2.2.7 In the case of **OTSUA** the following should also be provided

(a) Automatic switching scheme schedules including diagrams and an explanation of how the **System** will operate and what plant will be affected by the schemes **Operation**.

(b) **Intertripping** schemes both Generation and **Demand**. In each case a diagram of the scheme and an explanation of how the **System** will operate and what **Plant** will be affected by the schemes **Operation**.

PC.A.2.3 Lumped System Susceptance

PC.A.2.3.1 For all parts of the **User's Subtransmission System** (and any **OTSUA**) which are not included in the **Single Line Diagram** provided under PC.A.2.2.1, each **User** shall provide the equivalent lumped shunt susceptance at nominal **Frequency**.

PC.A.2.3.1.1 This should include shunt reactors connected to cables which are not normally in or out of service independent of the cable (ie. they are regarded as part of the cable).

PC.A.2.3.1.2 This should not include:

(a) independently switched reactive compensation equipment connected to the **User's System** specified under PC.A.2.4, or;

(b) any susceptance of the **User's System** inherent in the **Demand** (**Reactive Power**) data specified under PC.A.4.3.1.

PC.A.2.4 Reactive Compensation Equipment

PC.A.2.4.1 For all independently switched reactive compensation equipment (including any **OTSUA**), including that shown on the **Single Line Diagram**, not operated by **The Company** and connected to the **User's System** at 132kV and above in England and Wales and 33kV and above in Scotland and **Offshore** (including any **OTSDUW Plant and Apparatus** operating at **High Voltage**), other than **Power Factor** correction equipment associated directly with **Customers' Plant** and **Apparatus**, the following information is required:

(a) type of equipment (eg. fixed or variable);

(b) capacitive and/or inductive rating or its operating range in MVAr;

(c) details of any automatic control logic to enable operating characteristics to be determined;

(d) the point of connection to the **User's System** (including **OTSUA**) in terms of electrical location and **System** voltage.

(e) In the case of **OTSDUW Plant and Apparatus** the **User** should also provide:-

(i) Connection node, voltage, rating, power loss, tap range and connection arrangement.

(ii) A mathematical representation in block diagram format to model the control of any dynamic compensation plant. The model should be suitable for RMS dynamic stability type studies where each time constant should be no less than 10ms.

(iii) For Static Var Compensation equipment the **User** should provide:

HV Node

LV Node

Control Node

Nominal Voltage (kV)

Target Voltage (kV)

Maximum MVAr at HV

Minimum MVAr at HV

Slope %

Voltage dependant Q Limit

Normal Running Mode

Positive and zero phase sequence resistance and reactance

Transformer winding type

Connection arrangements

PC.A.2.4.2 **DC Converter Station** owners, **HVDC System Owners** (and a **User** where the **OTSUA** includes an **OTSDUW DC Converter**) are also required to provide information about the reactive compensation and harmonic filtering equipment required to ensure that their **Plant** and **Apparatus** (and the **OTSUA**) complies with the criteria set out in CC.6.1.5 or ECC.6.1.5 (as applicable).

PC.A.2.5 Short Circuit Contribution to National Electricity Transmission System

PC.A.2.5.1 General

(a) To allow **The Company** to calculate fault currents, each **User** is required to provide data, calculated in accordance with **Good Industry Practice**, as set out in the following paragraphs of PC.A.2.5.

(b) The data should be provided for the **User's System** with all **Generating Units** (including **Synchronous Generating Units**), **Power Park Units**, **HVDC Systems** and **DC Converters Synchronised** to that **User's System** (and any **OTSUA** where appropriate). The **User** must ensure that the pre-fault network conditions reflect a credible **System** operating arrangement.

(c) The list of data items required, in whole or part, under the following provisions, is set out in PC.A.2.5.6. Each of the relevant following provisions identifies which data items in the list are required for the situation with which that provision deals.

The fault currents in sub-paragraphs (a) and (b) of the data list in PC.A.2.5.6 should be based on an a.c. load flow that takes into account any pre-fault current flow across the **Point of Connection** (and in the case of **OTSUA**, **Interface Points** and **Connection Points**) being considered.

Measurements made under appropriate **System** conditions may be used by the **User** to obtain the relevant data.

(d) **The Company** may at any time, in writing, specifically request for data to be provided for an alternative **System** condition, for example minimum plant, and the **User** will, insofar as such request is reasonable, provide the information as soon as reasonably practicable following the request.

PC.A.2.5.2 **Network Operators** and **Non-Embedded Customers** are required to submit data in accordance with PC.A.2.5.4. **Generators**, **DC Converter Station** owners, **HVDC System Owners** and **Network Operators**, in respect of **Embedded Medium Power Stations** not subject to a Bil**ateral Agreement** and **Embedded DC Converter Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Systems** within such **Network Operator's Systems** are required to submit data in accordance with PC.A.2.5.5.

PC.A.2.5.3 Where prospective short-circuit currents on **Transmission** equipment are close to the equipment rating, and in **The Company's** reasonable opinion more accurate calculations of the prospective short circuit currents are required, then **The Company** will request additional data as outlined in PC.A.6.6 below.

PC.A.2.5.4 Data from Network Operators and Non-Embedded Customers

PC.A.2.5.4.1 Data is required to be provided at each node on the **Single Line Diagram** provided under PC.A.2.2.1 at which motor loads and/or **Embedded Small Power Stations** and/or **Embedded Medium Power Stations** and/or **Embedded** installations of direct current converters which do not form a **DC Converter Station** or **HVDC System** are connected, assuming a fault at that location, as follows:-

The data items listed under the following parts of PC.A.2.5.6:-

(a) (i), (ii), (iii), (iv), (v) and (vi);

and the data items shall be provided in accordance with the detailed provisions of PC.A.2.5.6(c) - (f).

PC.A.2.5.4.2 **Network Operators** shall provide the following data items in respect of each **Interface Point** within their **User System**:

(a) **Maximum Export Capacity**;

(b) **Maximum Import Capacity**; and,

(c) **Interface Point Target Voltage/Power Factor**

**Network Operators** shall alongside these parameters include details of any manual or automatic post fault actions to be taken by the owner / operator of the **Offshore Transmission System** connected to such **Interface Point** that are required by the **Network Operator**.

PC.A.2.5.5 Data from **Generators** (including **Generators** undertaking **OTSDUW** and those responsible for **DC Connected Power Park Modules**), **DC Converter Station** owners, **HVDC System Owners** and from **Network Operators** in respect of **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded DC Converter Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Systems** within such **Network Operator's Systems**.

PC.A.2.5.5.1 For each **Generating Unit** (including **Synchronous Generating Units** forming part of a **Synchronous Power Generating Module**) with one or more associated **Unit Transformers**, the **Generator**, or the **Network Operator** in respect of **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded DC Converter Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Systems** within such **Network Operator's System** is required to provide values for the contribution of the **Power Station Auxiliaries** (including **Auxiliary Energy Supplies**) to the fault current flowing through the **Unit Transformer(s)**.

The data items listed under the following parts of PC.A.2.5.6(a) should be provided:-

(i), (ii) and (v);

(iii) if the associated **Generating Unit** (including **Synchronous Generating Units** forming part of a **Synchronous Power Generating Module**) step-up transformer can supply zero phase sequence current from the **Generating Unit** side to the **National Electricity Transmission System**;

(iv) if the value is not 1.0 p.u;

and the data items shall be provided in accordance with the detailed provisions of PC.A.2.5.6(c) - (f), and with the following parts of this PC.A.2.5.5.

PC.A.2.5.5.2 Auxiliary motor short circuit current contribution and any **Auxiliary Gas Turbine Unit** contribution through the **Unit Transformers** must be represented as a combined short circuit current contribution at the **Generating Unit's** (including **Synchronous Generating Units** forming part of a **Synchronous Power Generating Module**) terminals, assuming a fault at that location.

PC.A.2.5.5.3 If the **Power Station** or **HVDC System** or **DC Converter Station** (or **OTSDUW Plant and Apparatus** which provides a fault infeed) has separate **Station Transformers**, data should be provided for the fault current contribution from each transformer at its high voltage terminals, assuming a fault at that location, as follows:-

The data items listed under the following parts of PC.A.2.5.6

(a) (i), (ii), (iii), (iv), (v) and (vi);

and the data items shall be provided in accordance with the detailed provisions of PC.A.2.5.6(b) - (f).

PC.A.2.5.5.4 Data for the fault infeeds through both **Unit Transformers** and **Station Transformers** shall be provided for the normal running arrangement when the maximum number of **Generating Units** (including **Synchronous Generating Units** forming part of a **Synchronous Power Generating Module**) are **Synchronised** to the **System** or when all the **DC Converters** at a **DC Converter Station** or **HVDC Converters** within an **HVDC System** are transferring **Rated MW** in either direction. Where there is an alternative running arrangement (or transfer in the case of a **DC Converter Station** or **HVDC System**) which can give a higher fault infeed through the **Station Transformers**, then a separate data submission representing this condition shall be made.

PC.A.2.5.5.5 Unless the normal operating arrangement within the **Power Station** is to have the **Station** and **Unit Boards** interconnected within the **Power Station**, no account should be taken of the interconnection between the **Station Board** and the **Unit Board**.

PC.A.2.5.5.6 Auxiliary motor short circuit current contribution and any auxiliary **DC Converter Station** contribution or **HVDC System** contribution through the **Station Transformers** must be represented as a combined short circuit current contribution through the **Station Transformers**.

PC.A.2.5.5.7 Where a **Manufacturer's Data & Performance Report** exists in respect of the model of the **Power Park Unit**, the **User** may opt to reference the Manu**facturer's Data & Performance Report** as an alternative to the provision of data in accordance with this PC.A.2.5.5.7. For the avoidance of doubt, all other data provision pursuant to the Grid Code shall still be provided including a Single Line Diagram and those data pertaining thereto.

For each **Power Park Module** (including **DC Connected Power Park Modules**) and each type of **Power Park Unit** (eg. a Doubly Fed Induction Generator) (and any **OTSDUW Plant and Apparatus** which provides a fault infeed), including any **Auxiliaries**, positive, negative and zero sequence root mean square current values are to be provided of the contribution to the short circuit current flowing at:

(i) the **Power Park Unit** terminals, or the **Common Collection Busbar** if an equivalent **Single Line Diagram** and associated data as described in PC.A.2.2.2 is provided, and

(ii) the **Grid Entry Point** (and in case of **OTSUA**, **Transmission Interface Point**), or **User System Entry Point** if **Embedded**

for the following solid faults at the **Grid Entry Point** (and in case of **OTSUA**, **Interface Point**), or **User System Entry Point** if **Embedded**:

(i) a symmetrical three phase short circuit

(ii) a single phase to earth short circuit

(iii) a phase to phase short circuit

(iv) a two phase to earth short circuit

For a **Power Park Module** (including **DC Connected Power Park Modules**) in which one or more of the **Power Park Units** utilise a protective control such as a crowbar circuit, the data should indicate whether the protective control will act in each of the above cases and the effects of its action shall be included in the data. For any case in which the protective control will act, the data for the fault shall also be submitted for the limiting case in which the protective circuit will not act, which may involve the application of a non-solid fault, and the positive, negative and zero sequence retained voltages at;

(i) the **Power Park Unit** terminals, or the **Common Collection Busbar** if an equivalent **Single Line Diagram** and associated data is provided and

(ii) the **Grid Entry Point**, or **User System Entry Point** if **Embedded**

in this limiting case shall be provided.

For each fault for which data is submitted, the data items listed under the following parts of PC.A.2.5.6(a) shall be provided:-

(iv), (vii), (viii), (ix), (x);

In addition, if an equivalent **Single Line Diagram** has been provided the data items listed under the following parts of PC.A.2.5.6(a) shall be provided:-

(xi), (xii), (xiii);

In addition, for a **Power Park Module** (including **DC Connected Power Park Modules**) in which one or more of the **Power Park Units** utilise a protective control such as a crowbar circuit:-

the data items listed under the following parts of PC.A.2.5.6(a) shall be provided:-

(xiv), (xv);

All of the above data items shall be provided in accordance with the detailed provisions of PC.A.2.5.6(c), (d), (f).

Should actual data in respect of fault infeeds be unavailable at the time of the application for a **CUSC Contract** or **Embedded Development Agreement**, a limited subset of the data, representing the maximum fault infeed that may result from all of the plant types being considered, shall be submitted. This data will, as a minimum, represent the root mean square of the positive, negative and zero sequence components of the fault current for both single phase and three phase solid faults at the **Grid Entry Point** (or **User System Entry Point** if **Embedded**) at the time of fault application and 50ms following fault application. Actual data in respect of fault infeeds shall be submitted to **The Company** as soon as it is available, in line with PC.A.1.2

PC.A.2.5.6 Data Items

(a) The following is the list of data utilised in this part of the **PC**. It also contains rules on the data which generally apply:-

(i) Root mean square of the symmetrical three-phase short circuit current infeed at the instant of fault, ($I_1$");

(ii) Root mean square of the symmetrical three-phase short circuit current after the subtransient fault current contribution has substantially decayed, ($I_1$');

(iii) the zero sequence source resistance and reactance values of the **User's System** as seen from the node on the **Single Line Diagram** provided under PC.A.2.2.1 (or **Power Generating Module** or **Station Transformer** high voltage terminals or **Generating Unit** terminals or **DC Converter** terminals or **HVDC System** terminals, as appropriate) consistent with the infeed described in PC.A.2.5.1.(b);

(iv) root mean square of the pre-fault voltage at which the maximum fault currents were

calculated;

(v) the positive sequence X/R ratio at the instant of fault;

(vi) the negative sequence resistance and reactance values of the **User's System** seen from the node on the **Single Line Diagram** provided under PC.A.2.2.1 (or **Power Generating Module** or **Station Transformer** high voltage terminals, or **Generating Unit** terminals or **DC Converter** terminals or **HVDC System** terminals as appropriate) if substantially different from the values of positive sequence resistance and reactance which would be derived from the data provided above;

(vii) A continuous trace and a table showing the root mean square of the positive, negative and zero sequence components of the short circuit current between zero and 140ms at 10ms intervals;

(viii) The **Active Power** (or **Interface Point Capacity** being exported pre-fault by the **OTSDUW Plant and Apparatus**) being generated pre-fault by the **Power Park Module** (including **DC Connected Power Park Modules**) and by each type of **Power Park Unit**;

(ix) The reactive compensation shown explicitly on the **Single Line Diagram** that is switched in;

(x) The **Power Factor** of the **Power Park Module** (including **DC Connected Power Park Modules**) and of each **Power Park Unit** type;

(xi) The positive sequence X/R ratio of the equivalent at the **Common Collection Busbar** or **Interface Point** in the case of **OTSUA**;

(xii) The minimum zero sequence impedance of the equivalent seen from the **Common Collection Busbar** or **Interface Point** in the case of **OTSUA**;

(xiii) The number of **Power Park Units** represented in the equivalent **Power Park Unit**;

(xiv) The additional rotor resistance and reactance (if any) that is applied to the **Power Park Unit** under a fault condition;

(xv) A continuous trace and a table showing the root mean square of the positive, negative and zero sequence components of the retained voltage at the fault point and **Power Park Unit** terminals, or the **Common Collection Busbar** if an equivalent **Single Line Diagram** and associated data as described in PC.A.2.2.2 is provided or **Interface Point** in the case of **OTSUA**, representing the limiting case, which may involve the application of a non-solid fault, required to not cause operation of the protective control;

(b) In considering this data, unless the **User** notifies **The Company** accordingly at the time of data submission, **The Company** will assume that the time constant of decay of the subtransient fault current corresponding to the change from $I_1$" to $I_1$', (T") is not significantly different from 40ms. If that assumption is not correct in relation to an item of data, the **User** must inform **The Company** at the time of submission of the data.

(c) The value for the X/R ratio must reflect the rate of decay of the d.c. component that may be present in the fault current and hence that of the sources of the initial fault current. All shunt elements and loads must therefore be deleted from any system model before the X/R ratio is calculated.

(d) In producing the data, the **User** may use "time step analysis" or "fixed-point-in-time analysis" with different impedances.

(e) If a fixed-point-in-time analysis with different impedances method is used, then in relation to the data submitted under (a) (i) above, the data will be required for "time zero" to give $I_1$". The figure of 120ms is consistent with a decay time constant T" of 40ms, and if that figure is different, then the figure of 120ms must be changed accordingly.

(f) Where a "time step analysis" is carried out, the X/R ratio may be calculated directly from the rate of decay of the d.c. component. The X/R ratio is not that given by the phase angle of the fault current if this is based on a system calculation with shunt loads, but from the Thévenin equivalent of the system impedance at the instant of fault with all non-source shunts removed.

PC.A.3 POWER GENERATING MODULE, GENERATING UNIT, HVDC SYSTEM AND DC CONVERTER DATA

PC.A.3.1 Introduction

Directly Connected

PC.A.3.1.1 Each **Generator**, **HVDC System Owner** and **DC Converter Station** owner (and a **User** where the **OTSUA** includes an **OTSDUW DC Converter**) with an existing, or proposed, **Power Station** or **DC Converter Station** or **HVDC System** directly connected, or to be directly connected, to the **National Electricity Transmission System** (or in the case of **OTSUA**, the **Interface Point**), shall provide **The Company** with data relating to that **Power Station** or **DC Converter Station** or **HVDC System**, both current and forecast, as specified in PC.A.3.2 to PC.A.3.4.

Embedded

PC.A.3.1.2 (a) Each **Generator**, **HVDC System Owner** and **DC Converter Station** owner in respect of its existing, and/or proposed, **Embedded Large Power Stations** and/or **Embedded HVDC Systems** and/or **Embedded DC Converter Stations** and/or its **Embedded Medium Power Stations** subject to a **Bilateral Agreement** and each **Network Operator** in respect of its **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and/or **Embedded DC Converter Stations** not subject to a **Bilateral Agreement** and/or **Embedded HVDC Systems** not subject to a **Bilateral Agreement** within such **Network Operator's System** in each case connected to the **Subtransmission System**, shall provide **The Company** with data relating to that **Power Station** or **DC Converter Station** or **HVC System**, both current and forecast, as specified in PC.A.3.2 to PC.A.3.4.

(b) No data need be supplied in relation to any **Small Power Station** or any **Medium Power Station** or installations of direct current converters which do not form a **DC Converter Station** or **HVDC System**, connected at a voltage level below the voltage level of the **Subtransmission System** except:-

(i) in connection with an application for, or under, a **CUSC Contract**, or

(ii) unless specifically requested by **The Company** under PC.A.3.1.4.

PC.A.3.1.3 (a) Each **Network Operator** shall provide **The Company** with the data specified in PC.A.3.2.2(c)(i) and (ii) and PC.A.3.2.2(i).

(b) **Network Operators** need not submit planning data in respect of an **Embedded Small Power Station** unless required to do so under PC.A.1.2(b) or unless specifically requested under PC.A.3.1.4 below, in which case they will supply such data.

PC.A.3.1.4 (a) PC.A.4.2.4(b) and PC.A.4.3.2(a) explain that the forecast **Demand** submitted by each **Network Operator** must be net of the output of all **Small Power Stations** and **Medium Power Stations** and **Customer Generating Plant** and all installations of direct current converters which do not form a **DC Converter Station** or **HVDC System**, **Embedded** within that **Network Operator's System**. The **Network Operator** must inform **The Company** of:

(i) the number of such **Embedded Power Stations** and such **Embedded** installations of direct current converters (including the number of **Generating Units** or **Power Park Modules** (including **DC Connected Power Park Modules**) or **DC Converters** or **HVDC Systems**) together with their summated capacity; and

(ii) beginning from the 2015 Week 24 data submission, for each **Embedded Small**

**Power Station** of registered capacity (as defined in the **Distribution Code**) of 1MW or more:

1. A reference which is unique to each **Network Operator**;
2. The production type as follows:

a) In the case of an **Embedded Small Power Station** first connected on or after 1 January 2015, the production type must be selected from the list below:

- Biomass;
- Fossil brown coal/lignite;
- Fossil coal-derived gas;
- Fossil gas;
- Fossil hard coal;
- Fossil oil;
- Fossil oil shale;
- Fossil peat;
- Geothermal;
- Hydro pumped storage;
- Hydro run-of-river and poundage;
- Hydro water reservoir;
- Marine;
- Nuclear;
- Other renewable;
- Solar;
- Waste;
- Wind offshore;
- Wind onshore; or
- Other;

together with a statement as to whether the generation forms part of a CHP scheme;

(iii) beginning from the 2019 Week 24 data submission, for **Embedded Power Stations** with **Registered Capacity** of less than 1MW, their best estimate of the aggregated capacity of all such **Embedded Power Stations** per production type as defined in the list in PC.A.3.1.4 (a)(ii)(2)(a).

b) In the case of an **Embedded Small Power Station** first connected to the **Users' System** before 1 January 2015, as an alternative to the production type, the technology type(s) used, selected from the list set out at paragraph 2.23 in Version 2 of the Regulatory Instructions and Guidance relating to the distributed generation incentive, innovation funding incentive and registered power zones, reference 83/07, published by Ofgem in April 2007;

c) In the case of an **Embedded Small Power Station** comprising **Electricity Storage Modules** or **Electricity Storage Units** first connected the **User's System** on or after May 20 2020, the storage type must be selected from the list below:

-Chemical
Ammonia
Hydrogen
Synthetic Fuels
Drop-in Fuels
Methanol
Synthetic Natural Gas

-Electrical
Supercapacitors
Superconducting Magnetic ES (SMES)
-Mechanical
Adiabatic Compressed Air
Diabatic Compressed Air
Liquid Air Energy Storage
Pumped Hydro
Flywheels
-Thermal
Latent Heat Storage
Thermochemical Storage
Sensible Heat Storage
-Electrochemical
Classic Batteries
Lead Acid
Lithium Polymer (Li-Polymer)
Metal Air
Nickle Cadmium (Ni-Cd)
Sodium Nickle Chloride ($Na\text{-}NiCl_2$)
Lithium Ion (Li–ion)
Sodium Ion (Na–ion)
Lithium Sulphur (Li-S)
Sodium Sulphur(Na-S
Nickle –Metal Hydride (Ni-MH)
Flow Batteries
Vanadium Red-Oxide
Zinc – Iron (Zn –Fe)
Zinc – Bromine (Zn –Br)
Other

together with a statement as to whether the storage forms part of a CHP scheme. Where this information is not held by the **Network Operator** it should provide its best view of the type of storage technology.

3. The registered capacity (as defined in the **Distribution Code**) in MW;

4. The lowest voltage level node that is specified on the most up-to-date **Single Line Diagram** to which it connects or where it will export most of its power;

5. Where it generates electricity from wind or PV, the geographical location using either latitude or longitude or grid reference coordinates of the primary or higher voltage substation to which it connects;

6. The reactive power and voltage control mode, including the voltage set-point and reactive range, where it operates in voltage control mode, or the target **Power Factor**, where it operates in **Power Factor** mode;

7. Details of the types of loss of mains **Protection** in place and their relay settings which in the case of **Embedded Small Power Stations** first connected to the **Users' System** before 1 January 2015 shall be provided on a reasonable endeavours basis.

(b) On receipt of this data, the **Network Operator** or **Generator** (if the data relates to **Power Stations** referred to in PC.A.3.1.2) may be further required, at **The Company's** reasonable discretion, to provide details of **Embedded Small Power Stations** and **Embedded Medium Power Stations** and **Customer Generating Plant** and **Embedded** installations of direct current converters which do not form a **DC Converter Station** or **HVDC System**, both current and forecast, as specified in PC.A.3.2 to PC.A.3.4. Such requirement would arise where **The Company** reasonably considers that the collective effect of a number of such **Embedded Power Stations** and **Customer Generating Plants** and **Embedded** installations of direct current converters may have a significant system effect on the **National Electricity Transmission System**.

Busbar Arrangements

PC.A.3.1.5 Where **Generating Units**, which term includes **CCGT Units** and **Synchronous Generating Units** within a **Synchronous Power Generating Module** and **Power Park Modules** (including **DC Connected Power Park Modules**), and **DC Converters**, and **HVDC Systems** are connected to the **National Electricity Transmission System** via a busbar arrangement which is or is expected to be operated in separate sections, the section of busbar to which each **Generating Unit** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**), **DC Converter**, **HVDC System** or **Power Park Module** (including **DC Connected Power Park Modules**) is connected is to be identified in the submission.

PC.A.3.2 Output Data

PC.A.3.2.1 (a) **Large Power Stations** and **Gensets**

Data items PC.A.3.2.2 (a), (b), (c), (d), (e), (f) and (h) are required with respect to each **Large Power Station** and each **Generating Unit** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module)** and **Power Park Module** (including **DC Connected Power Park Modules**) of each **Large Power Station** and for each **Genset** (although (a) is not required for **CCGT Units** and (b), (d) and (e) are not normally required for **CCGT Units** and (a), (b), (c), (d), (e), (f) and (h) are not normally required for **Power Park Units**).

(b) **Embedded Small Power Stations** and **Embedded Medium Power Stations**

Data item PC.A.3.2.2 (a) is required with respect to each **Embedded Small Power Station** and **Embedded Medium Power Station** and each **Generating Unit** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**) and **Power Park Module** (including **DC Connected Power Park Modules**) of each **Embedded Small Power Station** and **Embedded Medium Power Station** (although (a) is not required for **CCGT Units** or **Power Park Units**). In addition, data item PC.A.3.2.2(c)(ii) is required with respect to each **Embedded Medium Power Station**.

(c) **CCGT Units/Modules**

(i) Data item PC.A.3.2.2 (g) is required with respect to each **CCGT Unit**;

(ii) data item PC.A.3.2.2 (a) is required with respect to each **CCGT Module**; and

(iii) data items PC.A.3.2.2 (b), (c), (d) and (e) are required with respect to each **CCGT Module** unless **The Company** informs the relevant **User** in advance of the submission that it needs the data items with respect to each **CCGT Unit** for particular studies, in which case it must be supplied on a **CCGT Unit** basis.

Where any definition utilised or referred to in relation to any of the data items does not reflect **CCGT Units**, such definition shall be deemed to relate to **CCGT Units** for the purposes of these data items. Any **Schedule** in the **DRC** which refers to these data items shall be interpreted to incorporate the **CCGT Unit** basis where appropriate;

(d) **Cascade Hydro Schemes**

Data item PC.A.3.2.2(i) is required with respect to each **Cascade Hydro Scheme**.

(e) **Power Park Units/Modules**

Data items PC.A.3.2.2 (k) is required with respect to each **Power Park Module** (including **DC Connected Power Park Modules**).

(f) **DC Converters** and **HVDC Systems**

Data items PC.A.3.2.2 (a), (b), (c), (d) (e) (f) (h) and (i) are required with respect of each **HVDC System**, each **DC Converter Station** and each **DC Converter** in each **DC Converter Station**. For installations of direct current converters which do not form a **DC Converter Station** only data item PC.A.3.2.2.(a) is required.

PC.A.3.2.2 Items (a), (b), (d), (e), (f), (g), (h), (i), (j) and (k) are to be supplied by each **Generator**, **DC Converter Station** owner, **HVDC System Owner** or **Network Operator** (as the case may be) in accordance with PC.A.3.1.1, PC.A.3.1.2, PC.A.3.1.3 and PC.A.3.1.4. Items (a), and (f)(iv) are to be supplied (as applicable) by a **Use**r in the case of **OTSUA** which includes an **OTSDUW DC Converter**. Item (c) is to be supplied by each **Network Operator** in all cases:-

(a) **Registered Capacity** (MW), **Maximum Capacity** (in the case of **Power Generating Modules** in addition to **Registered Capacity** on a **Power Station** basis**)** or **Interface Point Capacity** in the case of **OTSDUW**;

(b) **Output Usable** (MW) on a monthly basis;

(c) (i) **System Constrained Capacity** (MW) ie. any constraint placed on the capacity of the **Embedded Generating Unit** (including a **Synchronous Generating Unit** within a **Synchronous Power Generating Module**), **Embedded Power Park Module** (including **DC Connected Power Park Modules**) an **Offshore Transmission System** at an **Interface Point**, **Embedded HVDC System** or **DC Converter** at an **Embedded DC Converter Station** due to the **Network Operator's System** in which it is **Embedded.** Where **Generating Units** (which term includes **CCGT Units** and **Synchronous Generating Units** within a **Synchronous Power Generating Module**), **Power Park Modules** (including **DC Connected Power Park Modules**), **Offshore Transmission Systems** at an **Interface Point, HVDC Systems** or **DC Converters** are connected to a **Network Operator's User System** via a busbar arrangement which is or is expected to be operated in separate sections, details of busbar running arrangements and connected circuits at the substation to which the **Embedded Generating Unit** (including **Synchronous Generating Units** within an **Embedded Synchronous Power Generating Module)**, **Embedded Power Park Module** (including **DC Connected Power Park Modules**), **Offshore Transmission System** at an **Interface Point**, or **Embedded HVDC System** or **Embedded DC Converter** is connected sufficient for **The Company** to determine where the MW generated by each **Generating Unit** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**), **Power Park Module** (including **DC Connected Power Park Modules**), **HVDC System** or **DC Converter** at that **Power Station** or **DC Converter Station** or **Offshore Transmission System** at an **Interface Point** would appear onto the **National Electricity Transmission System**;

(ii) any **Reactive Despatch Network Restrictions**;

(d) **Minimum Generation** (MW), and in the case of **Power Generating Modules** only **Minimum Stable Operating Level** (MW) and **Minimum Regulating Level**;

(e) MW obtainable from **Generating Units** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**), **Power Park Modules** (including **DC Connected Power Park Modules**), **HVDC Systems** or **DC Converters** at a **DC Converter Station** in excess of **Registered Capacity** or **Maximum Capacity**;

(f) **Generator Performance Chart**:

(i) **GB Code User**(s) in respect of **Generating Units** shall provide a **Generator Performance Chart** and **EU Code Users** in respect of **Power Generating Modules** shall provide a **Power Generating Module Performance Chart** and a **Synchronous Generating Unit Performance Chart**.

(ii) at the electrical point of connection to the **Offshore Transmission System** for an **Offshore Synchronous Generating Unit** and **Offshore Synchronous Power Generating Module**.

(iii) at the electrical point of connection to the **National Electricity Transmission System** (or **User System** if **Embedded**) for a **Non Synchronous Generating Unit** (excluding a **Power Park Unit**), **Power Park Module** (including **DC Connected Power Park Modules**), **HVDC System** and **DC Converter** at a **DC Converter Station**;

(iv) at the **Interface Point** for **OTSDUW Plant and Apparatus**

Where a **Reactive Despatch Network Restriction** applies, its existence and details should be highlighted on the **Generator Performance Chart**, in sufficient detail for **The Company** to determine the nature of the restriction.

(g) a list of the **CCGT Units** within a **CCGT Module**, identifying each **CCGT Unit**, and the **CCGT Module** of which it forms part, unambiguously. In the case of a **Range CCGT Module**, details of the possible configurations should also be submitted, together:-

(i) (in the case of a **Range CCGT Module** connected to the **National Electricity Transmission System**) with details of the single **Grid Entry Point** (there can only be one) at which power is provided from the **Range CCGT Module**;

(ii) (in the case of an **Embedded Range CCGT Module**) with details of the single **User System Entry Point** (there can only be one) at which power is provided from the **Range CCGT Module**;

Provided that, nothing in this sub-paragraph (g) shall prevent the busbar at the relevant point being operated in separate sections;

(h) expected running regime(s) at each **Power Station**, **HVDC System** or **DC Converter Station** and type of **Power Generating Module** or **Generating Unit** (as applicable), eg. **Steam Unit**, **Gas Turbine Unit**, **Combined Cycle Gas Turbine Unit**, **Power Park Module** (including **DC Connected Power Park Modules**), **Novel Units** (specify by type), etc;

(i) a list of **Power Stations** and **Generating Units** within a **Cascade Hydro Scheme**, identifying each **Generating Unit** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**) and **Power Station** and the **Cascade Hydro Scheme** of which each form part unambiguously. In addition:

(i) details of the **Grid Entry Point** at which **Active Power** is provided, or if **Embedded** the **Grid Supply Point(s)** within which the **Generating Unit** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module)** is connected;

(ii) where the **Active Power** output of a **Generating Unit** is split between more than one **Grid Supply Points** the percentage that would appear under normal and outage conditions at each **Grid Supply Point**.

(j) The following additional items are only applicable to **DC Converters** at **DC Converter Stations** and **HVDC Systems**.

**Registered Import Capacity** (MW);

**Import Usable** (MW) on a monthly basis;

**Minimum Import Capacity** (MW);

MW that may be absorbed by a **DC Converter** or **HVDC System** in excess of **Registered Import Capacity** and **Maximum HVDC Active Power Transmission Capacity** under importing conditions and the duration for which this is available;

(k) the number and types of the **Power Park Units** within a **Power Park Module** (including **DC Connected Power Park Modules**), identifying each **Power Park Unit**, the **Power Park Module** of which it forms part and identifying the **BM Unit** of which each **Power Park Module** forms part, unambiguously. In the case of a **Power Station** directly connected to the **National Electricity Transmission System** with multiple **Power Park Modules** (including **DC Connected Power Park Modules**) where **Power Park Units** can be selected to run in different **Power Park Modules** and/or **Power Park Modules** can be selected to run in different **BM Units**, details of the possible configurations should also be submitted. In addition, for **Offshore Power Park Modules** (including **DC Connected Power Park Modules**), the number of **Offshore Power Park Strings** that are aggregated into one **Offshore Power Park Module** should also be submitted.

(l) the number and types of the **Synchronous Generating Units** within a **Synchronous Power Generating Module**, identifying each **Synchronous Generating Unit**, the **Synchronous Power Generating Module** of which it forms part and identifying the **BM Unit** of which each **Synchronous Power Generating Module** forms part, unambiguously. In the case of a **Power Station** directly connected to the **National Electricity Transmission System** with multiple **Synchronous Power Generating Modules** where **Synchronous Generating Units** can be selected to run in different **Synchronous Power Generating Modules** and/or **Synchronous Power Generating Modules** can be selected to run in different **BM Units**, details of the possible configurations should also be submitted.

PC.A.3.2.3 Notwithstanding any other provision of this PC, the **CCGT Units** within a **CCGT Module**, details of which are required under paragraph (g) of PC.A.3.2.2, can only be amended in accordance with the following provisions:-

(a) if the **CCGT Module** is a **Normal CCGT Module**, the **CCGT Units** within that **CCGT Module** can only be amended such that the **CCGT Module** comprises different **CCGT Units** if **The Company** gives its prior consent in writing. Notice of the wish to amend the **CCGT Units** within such a **CCGT Module** must be given at least 6 months before it is wished for the amendment to take effect;

(b) if the **CCGT Module** is a **Range CCGT Module**, the **CCGT Units** within that **CCGT Module** and the **Grid Entry Point** at which the power is provided can only be amended as described in BC1.A1.6.4.

PC.A.3.2.4 Notwithstanding any other provision of this **PC**, the **Power Park Units** within a **Power Park Module** (including **DC Connected Power Park Modules**), and the **Power Park Modules** (including **DC Connected Power Park Modules**) within a **BM Unit**, details of which are required under paragraph (k) of PC.A.3.2.2, can only be amended in accordance with the following provisions:-

(a) if the **Power Park Units** within that **Power Park Module** can only be amended such that the **Power Park Module** comprises different **Power Park Units** due to repair/replacement of individual **Power Park Units** if **The Company** gives its prior consent in writing. Notice of the wish to amend a **Power Park Unit** within such a **Power Park Module** (including **DC Connected Power Park Modules**) must be given at least 4 weeks before it is wished for the amendment to take effect;

(b) if the **Power Park Units** within that **Power Park Module** (including **DC Connected Power Park Modules**) and/or the **Power Park Modules** (including **DC Connected Power Park Modules**) within that **BM Unit** can be selected to run in different **Power Park Modules** and/or **BM Units** as an alternative operational running arrangement the **Power Park Units** within the **Power Park Module**, the **BM Unit** of which each **Power Park Module** forms part, and the **Grid Entry Point** at which the power is provided can only be amended as described in BC1.A.1.8.4.

PC.A.3.2.5 Notwithstanding any other provision of this **PC**, the **Synchronous Generating Units** within a **Synchronous Power Generating Module**, and the **Synchronous Power Generating Modules** within a **BM Unit**, details of which are required under paragraph (l) of PC.A.3.2.2, can only be amended in accordance with the following provisions:-

(a) if the **Synchronous Generating Units** within that **Synchronous Power Generating Module** can only be amended such that the **Synchronous Power Generating Module** comprises different **Synchronous Generating Units** due to repair/replacement of individual **Synchronous Generating Units** if **The Company** gives its prior consent in writing. Notice of the wish to amend a **Synchronous Generating Unit** within such a **Synchronous Power Generating Module** must be given at least 4 weeks before it is wished for the amendment to take effect;

(b) if the **Synchronous Generating Units** within that **Synchronous Power Generating Module** and/or the **Synchronous Power Generating Modules** within that **BM Unit** can be selected to run in different **Synchronous Power Generating Modules** and/or **BM Units** as an alternative operational running arrangement the **Synchronous Generating Units** within the **Synchronous Power Generating Module**, the **BM Unit** of which each **Synchronous Power Generating Module** forms part, and the **Grid Entry Point** at which the power is provided can only be amended as described in BC1.A.1.9.4(c).The requirements of PC.A.3.2.5 need not be satisfied if **Generators** have already submitted data in respect of PC.A.3.2.3, PC.A.3.2.4 and PC.A.3.2.5 for the same **Power Generating Module**.

PC.A.3.3. Rated Parameters Data

PC.A.3.3.1 The following information is required to facilitate an early assessment, by **The Company**, of the need for more detailed studies;

(a) for all **Generating Units** (excluding **Power Park Units**) and **Power Park Modules** (including **DC Connected Power Park Modules**):

Rated MVA

**Rated MW**;

(b) for each **Synchronous Generating Unit** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**):

Short circuit ratio

Direct axis transient reactance;

Inertia constant (for whole machine), MWsecs/MVA;

(c) for each **Synchronous Generating Unit** step-up transformer (including the step up transformer of a **Synchronous Generating Unit** within a **Synchronous Power Generating Module**):

Rated MVA

Positive sequence reactance (at max, min and nominal tap);

(d) for each **DC Converter** at a **DC Converter Station**, **HVDC System**, **DC Converter** connecting a **Power Park Module** (including a **DC Connected Power Park Module**) and **Transmission DC Converter** (forming part of an **OTSUA**).

**DC Converter** or **HVDC Converter** type (e.g. current/voltage sourced)

**Rated MW** per pole for import and export

Number of poles and pole arrangement

Rated DC voltage/pole (kV)

Return path arrangement

Remote AC connection arrangement (excluding **OTSDUW DC Converters**)

**Maximum HVDC Active Power Transmission Capacity**

**Minimum Active Power Transmission Capacity**

(e) for each type of **Power Park Unit** in a **Power Park Module** not connected to the **Total System** by a **DC Converter** or **HVDC System**:

Rated MVA

**Rated MW**

Rated terminal voltage

Inertia constant, (MWsec/MVA)

Additionally, for **Power Park Units** that are squirrel-cage or doubly-fed induction generators driven by wind turbines:

Stator reactance.

Magnetising reactance.

Rotor resistance (at rated running)

Rotor reactance (at rated running)

The generator rotor speed range (minimum and maximum speeds in RPM) (for doubly-fed induction generators only)

Converter MVA rating (for doubly-fed induction generators only)

For a **Power Park Unit** consisting of a synchronous machine in combination with a back-to-back **DC Converter** or **HVDC Converter**, or for a **Power Park Unit** not driven by a wind turbine, the data to be supplied shall be agreed with **The Company** in accordance with PC.A.7.

This information should only be given in the data supplied in accordance with PC.4.4 and PC.4.5.

PC.A.3.4 General Generating Unit, Power Park Module (including **DC Connected Power Park Modules**), Power Generating Module, HVDC System and DC Converter Data

PC.A.3.4.1 The point of connection to the **National Electricity Transmission System** or the **Total System**, if other than to the **National Electricity Transmission System**, in terms of geographical and electrical location and system voltage is also required.

PC.A.3.4.2 (a) Type of **Generating Unit** (ie **Synchronous Power Generating Unit** within a **Power Generating Module**, **Synchronous Generating Unit**, **Non-Synchronous Generating Unit**, **DC Converter**, **Power Park Module** (including **DC Connected Power Park Modules**) or **HVDC System**).

(b) In the case of a **Synchronous Generating Unit** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module)** details of the **Exciter** category, for example whether it is a rotating **Exciter** or a static **Exciter** or in the case of a **Non-Synchronous Generating Unit** the voltage control system.

(c) Whether a **Power System Stabiliser** is fitted.

PC.A.3.4.3 Each **Generator** shall supply **The Company** with the production type(s) used as the primary source of power in respect of each **Generating Unit** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**), selected from the list set out below:

- Biomass
- Fossil brown coal/lignite
- Fossil coal-derived gas
- Fossil gas

- Fossil hard coal
- Fossil oil
- Fossil oil shale
- Fossil peat
- Geothermal
- Hydro pumped storage
- Hydro run-of-river and poundage
- Hydro water reservoir
- Marine
- Nuclear
- Other renewable
- Solar
- Waste
- Wind offshore
- Wind onshore
- Other

PC.A.3.4.4 In the case of an **Electricity Storage Module** or **Electricity Storage Unit**, each **Generator** shall supply **The Company** with the production type(s) used as the primary **Electricity Storage** source (including **Synchronous Electricity Storage Units** within a **Synchronous Electricity Storage Module**), selected from the list set out below:

-Chemical
- Ammonia
- Hydrogen
- Synthetic Fuels
- Drop-in Fuels
- Methanol
- Synthetic Natural Gas

-Electrical
- Supercapacitors
- Superconducting Magnetic ES (SMES)

-Mechanical
- Adiabatic Compressed Air
- Diabatic Compressed Air
- Liquid Air Energy Storage
- Pumped Hydro
- Flywheels

-Thermal
- Latent Heat Storage
- Thermochemical Storage
- Sensible Heat Storage

-Electrochemical
- Classic Batteries
  - Lead Acid
  - Lithium Polymer (Li-Polymer)
  - Metal Air
  - Nickle Cadmium (Ni-Cd)
  - Sodium Nickle Chloride (Na-$NiCl_2$)
  - Lithium Ion (Li–ion)
  - Sodium Ion (Na–ion)
  - Lithium Sulphur (Li-S)
  - Sodium Sulphur(Na-S

Nickle –Metal Hydride (Ni-MH)
Flow Batteries
Vanadium Red-Oxide
Zinc – Iron (Zn –Fe)
Zinc – Bromine (Zn –Br)
Other

PC.A.4 DEMAND AND ACTIVE ENERGY DATA

PC.A.4.1 Introduction

PC.A.4.1.1 Each **User** directly connected to the **National Electricity Transmission System** with **Demand** shall provide **The Company** with the **Demand** data, historic, current and forecast, as specified in PC.A.4.2 and PC.A.4.3. Paragraphs PC.A.4.1.2 and PC.A.4.1.3 apply equally to **Active Energy** requirements as to **Demand** unless the context otherwise requires.

PC.A.4.1.2 Data will need to be supplied by:

(a) each **Network Operator**, in relation to **Demand** and **Active Energy** requirements on its **User System**;

(b) each **Non-Embedded Customer, Pumped Storage Generators** (with respect to Pumping **Demand**) and **Generators** in relation to **Electricity Storage Modules** in relation to their **Demand** and **Active Energy** requirements.

(c) each **DC Converter Station** owner or **HVDC System Owner** in relation to **Demand** and **Active Energy** transferred (imported) to its **DC Converter Station** or **HVDC System**.

(d) each **OTSDUW DC Converter** in relation to the Demand at each **Interface Point** and **Connection Point**.

**Demand** of **Power Stations** directly connected to the **National Electricity Transmission System** is to be supplied by the **Generator** under PC.A.5.2.

PC.A.4.1.3 References in this **PC** to data being supplied on a half hourly basis refer to it being supplied for each period of 30 minutes ending on the hour or half-hour in each hour.

PC.A.4.1.4 **Access Periods** and **Access Groups**

PC.A.4.1.4.1 Each **Connection Point** must belong to one, and only one, **Access Group**.

PC.A.4.1.4.2 Each **Transmission Interface Circuit** must have an **Access Period**.

PC.A.4.1.4.3 The **Access Period** shall

(a) normally be a minimum of 8 continuous weeks and can occur in any one of three maintenance years during the period from calendar week 13 to calendar week 43 (inclusive) in each year; or,

(b) exceptionally and provided that agreement is reached between **The Company** and the relevant **User(s)**, such agreement to be sought in accordance with PC.7, the **Access Period** may be of a period not less than 4 continuous weeks and can occur in any one of three maintenance years during the period from calendar week 10 to calendar week 43 (inclusive) in each year.

PC.A.4.1.4.4 **The Company** shall submit in writing no later than calendar week 6 in each year:

(a) the calendar weeks defining the proposed start and finish of each **Access Period** for each **Transmission Interface Circuit**; and

(b) the **Connection Points** in each **Access Group**.

The submission by **The Company** under PC.A.4.1.4.4 (a) above shall commence in 2010 and shall then continue each year thereafter. The submission by **The Company** under PC.A.4.1.4.4 (b) shall commence in 2009 and then continue each year thereafter.

PC.A.4.1.4.5 It is permitted for **Access Periods** to overlap in the same **Access Group** and in the same maintenance year. However, where possible **Access Periods** will be sought by **The Company** that do not overlap with any other **Access Period** within that **Access Group** for each maintenance year. Where it is not possible to avoid overlapping **Access Periods**, **The Company** will indicate to **Users** by calendar week 6 its initial view of which **Transmission Interface Circuits** will need to be considered out of service concurrently for the purpose of assessing compliance to **Licence Standards**. The obligation on **The Company** to indicate which **Transmission Interface Circuits** will need to be considered out of service concurrently for the purpose of assessing compliance to **Licence Standards** shall commence in 2010 and shall continue each year thereafter.

PC.A.4.1.4.6 Following the submission(s) by **The Company** by week 6 in each year and where required by either party, both **The Company** and the relevant **User**(s) shall use their reasonable endeavours to agree the appropriate **Access Group(s)** and **Access Period** for each **Transmission Interface Circuit** prior to week 17 in each year. The requirement on **The Company** and the relevant **User(s)** to agree, shall commence in respect of **Access Groups** only in 2010. This paragraph PC.A.4.1.4.6 shall apply in its entirety in 2011 and shall then continue each year thereafter.

PC.A.4.1.4.7 In exceptional circumstances, and with the agreement of all parties concerned, where a **Connection Point** is specified for the purpose of the **Planning Code** as electrically independent **Subtransmission Systems**, then data submissions can be on the basis of two (or more) individual **Connection Points**.

PC.A.4.2 User's User System Demand (Active Power) and Active Energy Data

PC.A.4.2.1 Forecast daily **Demand** (**Active Power**) profiles, as specified in (a), (b) and (c) below, in respect of each of the **User's User Systems** (each summated over all **Grid Supply Points** in each **User System**) are required for:

(a) peak day on each of the **User's User Systems** (as determined by the **User**) giving the numerical value of the maximum **Demand** (**Active Power**) that in the **Users'** opinion could reasonably be imposed on the **National Electricity Transmission System**;

(b) day of peak **National Electricity Transmission System Demand** (**Active Power**) as notified by **The Company** pursuant to PC.A.4.2.2;

(c) day of minimum **National Electricity Transmission System Demand** (**Active Power**) as notified by **The Company** pursuant to PC.A.4.2.2.

In addition, the total **Demand** (**Active Power**) in respect of the time of peak **National Electricity Transmission System Demand** in the preceding **Financial Year** in respect of each of the **User's User Systems** (each summated over all **Grid Supply Points** in each **User System**) both outturn and weather corrected shall be supplied.

PC.A.4.2.2 No later than calendar week 17 each year, **The Company** shall notify each **Network Operator** and **Non-Embedded Customer** in writing of the following, for the current **Financial Year** and for each of the following nine **Financial Years**, which will, until replaced by the following year's notification, be regarded as the relevant specified days and times under PC.A.4.2.1:

(a) the date and time of the annual peak of the **National Electricity Transmission System Demand**;

(b) the date and time of the annual minimum of the **National Electricity Transmission System Demand**;

(c) the relevant **Access Period** for each **Transmission Interface Circuit**; and,

(d) concurrent **Access Periods** of two or more **Transmission Interface Circuits** (if any) that are situated in the same **Access Group**.

The submissions by **The Company** made under PC.A.4.2.1 (c) and PC.A.4.2.1 (d) above shall commence in 2010 and shall then continue in respect of each year thereafter.

PC.A.4.2.3 The total **Active Energy** used on each of the **Network Operators'** or **Non-Embedded Customers' User Systems** (each summated over all **Grid Supply Points** in each **User System**) in the preceding **Financial Year**, both outturn and weather corrected, together with a prediction for the current financial year, is required. Each **Active Energy** submission shall be subdivided into the following categories of **Customer** tariff:

LV1

LV2

LV3

HV

EHV

Traction

Lighting

In addition, the total **User System** losses and the **Active Energy** provided by **Embedded Small Power Stations** and **Embedded Medium Power Stations** shall be supplied.

PC.A.4.2.4 All forecast **Demand** (**Active Power**) and **Active Energy** specified in PC.A.4.2.1 and PC.A.4.2.3 shall:

(a) in the case of PC.A.4.2.1(a), (b) and (c), be such that the profiles comprise average **Active Power** levels in 'MW' for each time marked half hour throughout the day;

(b) in the case of PC.A.4.2.1(a), (b) and (c), be that remaining after any deductions reasonably considered appropriate by the **User** to take account of the output profile of all **Embedded Small Power Stations** and **Embedded Medium Power Stations** and **Customer Generating Plant** and imports across **Embedded External Interconnections** including imports across **Embedded** installations of direct current converters which do not form a **DC Converter Station** or **HVDC System** and **Embedded DC Converter Stations** and **Embedded HVDC Systems** with a **Registered Capacity** or **HVDC Active Power Transmission Capacity** of less than 100MW;

(c) be based upon **Annual ACS Conditions** for times that occur during week 44 through to week 12 (inclusive) and based on **Average Conditions** for weeks 13 to 43 (inclusive).

PC.A.4.3 Connection Point Demand (Active and Reactive Power)

PC.A.4.3.1 Forecast **Demand** (**Active Power**) and **Power Factor** (values of the **Power Factor** at maximum and minimum continuous excitation may be given instead where more than 95% of the total **Demand** at a **Connection Point** is taken by synchronous motors) to be met at each **Connection Point** within each **Access Group** is required for:

(a) the time of the maximum **Demand** (**Active Power**) at the **Connection Point** (as determined by the **User**) that in the **User's** opinion could reasonably be imposed on the **National Electricity Transmission System**;

(b) the time of peak **National Electricity Transmission System Demand** as provided by **The Company** under PC.A.4.2.2;

(c) the time of minimum **National Electricity Transmission System Demand** as provided by **The Company** under PC.A.4.2.2;

(d) the time of the maximum **Demand** (**Apparent Power**) at the **Connection Point** (as determined by the **User**) during the **Access Period** of each **Transmission Interface Circuit**;

(e) at a time specified by either **The Company** or a **User** insofar as such a request is reasonable.

Instead of such forecast **Demand** to be met at each **Connection Point** within each **Access Group** the **User** may (subject to PC.A.4.3.4) submit such **Demand** at each node on the **Single Line Diagram**.

In addition, the **Demand** in respect of each of the time periods referred to in PC.A.4.3.1 (a) to (e) in the preceding **Financial Year** in respect of each **Connection Point** within each **Access Group** both outturn and weather corrected shall be supplied. The "weather correction" shall normalise outturn figures to **Annual ACS Conditions** for times that occur during calendar week 44 through to calendar week 12 (inclusive) or **Average Conditions** for the period calendar weeks 13 to calendar week 43 (inclusive) and shall be performed by the relevant **User** on a best endeavours basis.

The submission by a **User** pursuant to PC.A.4.3.1 (d) shall commence in 2011 and shall then continue each year thereafter.

PC.A.4.3.2 All forecast **Demand** specified in PC.A.4.3.1 shall:

(a) be that remaining after any deductions reasonably considered appropriate by the **User** to take account of the output of all **Embedded Small Power Stations** and **Embedded Medium Power Stations** and **Customer Generating Plant** and imports across **Embedded External Interconnections**, including **Embedded** installations of direct current converters which do not form a **DC Converter Station**, **HVDC System** and **Embedded DC Converter Stations** and **Embedded HVDC Systems** and such deductions should be separately stated;

(b) include any **User's System** series reactive losses but exclude any reactive compensation equipment specified in PC.A.2.4 and exclude any network susceptance specified in PC.A.2.3;

(c) be based upon **Annual ACS Conditions** for times that occur during calendar week 44 through to calendar week 12 (inclusive) and based on **Average Conditions** for calendar weeks 13 to calendar week 43 (inclusive), both corrections being made on a best endeavours basis;

(d) reflect the **User's** opinion of what could reasonably be imposed on the **National Electricity Transmission System**.

PC.A.4.3.3 The date and time of the forecast maximum **Demand** (**Apparent Power**) at the **Connection Point** as specified in PC.A.4.3.1 (a) and (d) is required.

PC.A.4.3.4 Each **Single Line Diagram** provided under PC.A.2.2.2 shall include the **Demand** (**Active Power**) and **Power Factor** (values of the **Power Factor** at maximum and minimum continuous excitation may be given instead where more than 95% of the **Demand** is taken by synchronous motors) at the time of the peak **National Electricity Transmission System Demand** (as provided under PC.A.4.2.2) at each node on the **Single Line Diagram**. These **Demands** shall be consistent with those provided under PC.A.4.3.1(b) above for the relevant year.

PC.A.4.3.5 The **Single Line Diagram** must represent the **User's User System** layout under the period specified in PC.A.4.3.1(b) (at the time of peak **National Electricity Transmission System Demand**). Should the **User's User System** layout during the other times specified in PC.A.4.3.1 be planned to be materially different from the **Single Line Diagram** submitted to **The Company** pursuant to PC.A.2.2.1 the **User** shall in respect of such other times submit:

(i) an alternative **Single Line Diagram** that accurately reflects the revised layout and in such case shall also include appropriate associated data representing the relevant changes, or;

(ii) submit an accurate and unambiguous description of the changes to the **Single Line Diagram** previously submitted for the time of peak **National Electricity Transmission System Demand**.

Where a **User** does not submit any changes, **The Company** will assume that the **Single Line Diagram** (and associated circuit and node data) provided at the time of peak **National Electricity Transmission System Demand** will be valid for all other times. In respect of such other times, where the **User** does not submit such nodal demands at the times defined in PC.A.4.3.1(a), (c), (d) and (e), the nodal demands will be pro-rata, to be consistent with the submitted **Connection Point Demands**.

PC.A.4.4 **The Company** will assemble and derive in a reasonable manner, the forecast information supplied to it under PC.A.4.2.1, PC.A.4.3.1, PC.A.4.3.4 and PC.A.4.3.5 above into a cohesive forecast and will use this in preparing **Forecast Demand** information in the **Electricity Ten Year Statement** and for use in **The Company's Operational Planning**. If any **User** believes that the cohesive forecast **Demand** information in the **Electricity Ten Year Statement** does not reflect its assumptions on **Demand**, it should contact **The Company** to explain its concerns and may require **The Company**, on reasonable request, to discuss these forecasts. In the absence of such expressions, **The Company** will assume that **Users** concur with **The Company's** cohesive forecast.

PC.A.4.5 Post Fault User System Layout

PC.A.4.5.1 Where for the purposes of **The Company** assessing against the Licence Standards an **Access Group**, the **User** reasonably considers it appropriate that revised post fault **User System** layouts should be taken into account by **The Company**, the following information is required to be submitted by the **User**:

(i) the specified **Connection Point** assessment period (PC.A.4.3.1,(a)-(e)) that is being evaluated;

(ii) an accurate and unambiguous description of the **Transmission Interface Circuits** considered to be switched out due to a fault;

(iii) appropriate revised **Single Line Diagrams** and/or associated revised nodal **Demand** and circuit data detailing the revised **User System(s)** conditions;

(iv) where the **User's** planned post fault action consists of more than one component, each component must be explicitly identified using the **Single Line Diagram** and associated nodal **Demand** and circuit data;

(v) the arrangements for undertaking actions (eg the time taken, automatic or manual and any other appropriate information);.

The **User** must not submit any action that it does not have the capability or the intention to implement during the assessment period specified (subject to there being no further unplanned outages on the **User's User System**).

PC.A.4.6 Control of Demand or Reduction of Pumping Load Offered as Reserve

| | |
|---|---|
| Magnitude of **Demand** or pumping load or **Electricty Storage Module** charging load which is tripped | MW |
| **System Frequency** at which tripping is initiated | Hz |
| Time duration of **System Frequency** below trip setting for tripping to be initiated | S |
| Time delay from trip initiation to tripping | S |

PC.A.4.7 General Demand Data

PC.A.4.7.1 The following information is infrequently required and should be supplied (wherever possible) when requested by **The Company**:

(a) details of any individual loads (including (as applicable) the load behaviour of an **Electricity Storage Module** when operating in a mode analogous to demand) which have characteristics significantly different from the typical range of Domestic, Commercial , **Electricity Storage** or Industrial loads supplied;

(b) the sensitivity of the **Demand** (**Active** and **Reactive Power**) to variations in voltage and **Frequency** on the **National Electricity Transmission System** at the time of the peak **Demand** (**Active Power**). The sensitivity factors quoted for the **Demand** (**Reactive Power**) should relate to that given under PC.A.4.3.1 and, therefore, include any **User's System** series reactive losses but exclude any reactive compensation equipment specified in PC.A.2.4 and exclude any network susceptance specified in PC.A.2.3;

(c) details of any traction loads, e.g. connection phase pairs and continuous load variation with time;

(d) the average and maximum phase unbalance, in magnitude and phase angle, which the **User** would expect its **Demand** to impose on the **National Electricity Transmission System**;

(e) the maximum harmonic content which the **User** would expect its **Demand** to impose on the **National Electricity Transmission System**;

(f) details of all loads which may cause **Demand** fluctuations greater than those permitted under **Engineering Recommendation** P28 Issue 2, Stage 1 at a **Point of Common Coupling** including the **Flicker Severity Short Term** and the **Flicker Severity Long Term**.

(g) In the case of **Electricity Storage Modules**, details of the **Maximum Capacity, Maximum Import Power, Registered Import Capability**, charge time, discharge time and operating periods.

## PART 2 - DETAILED PLANNING DATA

PC.A.5 POWER GENERATING MODULE, GENERATING UNIT, POWER PARK MODULE (INCLUDING DC CONNECTED POWER PARK MODULES), DC CONVERTER, HVDC EQUIPMENT AND OTSDUW PLANT AND APPARATUS DATA

PC.A.5.1 Introduction

Directly Connected

PC.A.5.1.1 Each **Generator** (including those undertaking **OTSDUW**), with existing or proposed **Power Stations** directly connected, or to be directly connected, to the **National Electricity Transmission System**, shall provide **The Company** with data relating to that **Plant** and **Apparatus**, both current and forecast, as specified in PC.A.5.2, PC.A.5.3, PC.A.5.4 and PC.A.5.7 as applicable.

Each **DC Converter Station** owner or **HVDC System Owner**, with existing or proposed **DC Converter Stations** or **HVDC Systems** (including **Generators** undertaking **OTSDUW** which includes an **OTSDUW DC Converter**) directly connected, or to be directly connected, to the **National Electricity Transmission System**, shall provide **The Company** with data relating to that **Plant** and **Apparatus**, both current and forecast, as specified in PC.A.5.2 and PC.A.5.4.

**GB Generators**, **DC Converter Station** owners, **EU Generators** and **HVDC System Owners** shall ensure that the models supplied in respect of their **Plant** and **Apparatus** provide a true and accurate behaviour of the plant as built as required under PC.A.5.3.2(c), PC.A.5.4.2(a) and PC.A.5.4.3 and verified through the **Compliance Processes (CP)** or **European Compliance Processes** (**ECP**) as applicable.

Embedded

PC.A.5.1.2 Each **Generator**, in respect of its existing, or proposed, **Embedded Large Power Stations** and its **Embedded Medium Power Stations** subject to a **Bilateral Agreement** and each **Network Operator** in respect of **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** within its **System** shall provide **The Company** with data relating to each of those **Large Power Stations** and **Medium Power Stations**, both current and forecast, as specified in PC.A.5.2, PC.A.5.3, PC.A.5.4 and PC.A.5.7 as applicable.

Each **DC Converter Station** owner or **HVDC System Owner**, or **Network Operator** in the case of an **Embedded DC Converter Station** or **Embedded HVDC System** not subject to a **Bilateral Agreement** within its **System** with existing or proposed **HVDC Systems** or **DC Converter Stations** shall provide **The Company** with data relating to each of those **HVDC Systems** or **DC Converter Stations**, both current and forecast, as specified in PC.A.5.2 and PC.A.5.4.

However, no data need be supplied in relation to those **Embedded Medium Power Stations** or **Embedded DC Converter Stations** or **Embedded HVDC Systems** if they are connected at a voltage level below the voltage level of the **Subtransmission System** except in connection with an application for, or under a, **CUSC Contract** or unless specifically requested by **The Company** under PC.A.5.1.4.

**GB Generators**, **DC Converter Station** owners, **EU Generators** and **HVDC System Owners** shall ensure that the models supplied in respect of their **Plant** and **Apparatus** provide a true and accurate behaviour of the plant as built as required under PC.A.5.3.2(c), PC.A.5.4.2(a) and PC.A.5.4.3 and verified through the **Compliance Processes (CP)** or **European Compliance Processes** (**ECP**) as applicable

PC.A.5.1.3 Each **Network Operator** need not submit **Planning Data** in respect of **Embedded Small Power Stations** unless required to do so under PC.A.1.2(b), PC.A.3.1.4 or unless specifically requested under PC.A.5.1.4 below, in which case they will supply such data.

PC.A.5.1.4 PC.A.4.2.4(b) and PC.A.4.3.2(a) explained that the forecast **Demand** submitted by each **Network Operator** must be net of the output of all **Medium Power Stations** and **Small Power Stations** and **Customer Generating Plant Embedded** within that **User's System**. In such cases, the **Network Operator** must provide **The Company** with the relevant information specified under PC.A.3.1.4 . On receipt of this data further details may be required at **The Company's** discretion as follows:

(i) in the case of details required from the **Network Operator** for **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded DC Converter Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Systems** not subject to a **Bilateral Agreement** and **Embedded Small Power Stations** and **Embedded DC Converters** and **Embedded HVDC Systems** in each case within such **Network Operator's System** and **Customer Generating Plant**; and

(ii) in the case of details required from the **Generator** of **Embedded Large Power Stations** and **Embedded Medium Power Stations** subject to a **Bilateral Agreement**; and

(iii) in the case of details required from the **DC Converter Station** owner of an **Embedded DC Converter** or **DC Converter Station** or **HVDC System Owner** of an **Embedded HVDC System Owner** subject to a **Bilateral Agreement**.

both current and forecast, as specified in PC.A.5.2 and PC.A.5.3. Such requirement would arise when **The Company** reasonably considers that the collective effect of a number of such **Embedded Small Power Stations**, **Embedded Medium Power Stations**, **Embedded DC Converter Stations**, **Embedded HVDC Systems**, **DC Converters** and **Customer Generating Plants** may have a significant system effect on the **National Electricity Transmission System**.

PC.A.5.1.5 DPD I and DPD II

The **Detailed Planning Data** described in this Part 2 of the Appendix comprises both **DPD I** and **DPD II**. The required data is listed and collated in the **Data Registration Code**. The **Users** need to refer to the **DRC** to establish whether data referred to here is **DPD I** or **DPD II**.

PC.A.5.2 Demand

PC.A.5.2.1 For each **Generating Unit** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module)** which has an associated **Unit Transformer**, the value of the **Demand** supplied through this **Unit Transformer** when the **Generating Unit** is at **Rated MW** output is to be provided.

PC.A.5.2.2 Where the **Power Station** or **DC Converter Station** or **HVDC System** has associated **Demand** additional to the unit-supplied **Demand** of PC.A.5.2.1 which is supplied from either the **National Electricity Transmission System** or the **Generator's User System** the **Generator**, **DC Converter Station** owner, **HVDC System Owner** or the **Network Operator** (in the case of **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** within its **System**), as the case may be, shall supply forecasts for each **Power Station** or **DC Converter Station** or **HVDC System** of:

(a) the maximum **Demand** that, in the **User's** opinion, could reasonably be imposed on the **National Electricity Transmission System** or the **Generator's User System** as appropriate;

(b) the **Demand** at the time of the peak **National Electricity Transmission System Demand**

(c) the **Demand** at the time of minimum **National Electricity Transmission System Demand**.

PC.A.5.2.3 No later than calendar week 17 each year **The Company** shall notify each **Generator** in respect of its **Large Power Stations** and its **Medium Power Stations** and each **DC Converter** owner in respect of its **DC Converter Station** and each **HVDC System Owner** in respect of its **HVDC System** subject to a **Bilateral Agreement** and each **Network Operator** in respect of each **Embedded Medium Power Station** not subject to a **Bilateral Agreement** and each **Embedded DC Converter Station** or **Embedded HVDC System** not subject to a **Bilateral Agreement** within such **Network Operator's System** in writing of the following, for the current **Financial Year** and for each of the following nine **Financial Years**, which will be regarded as the relevant specified days and times under PC.A.5.2.2:

(a) the date and time of the annual peak of the **National Electricity Transmission System Demand** at **Annual ACS Conditions**;

(b) the date and time of the annual minimum of the **National Electricity Transmission System Demand** at **Average Conditions**.

PC.A.5.2.4 At its discretion, **The Company** may also request further details of the **Demand** as specified in PC.A.4.6

PC.A.5.2.5 In the case of **OTSDUW Plant and Apparatus** the following data shall be supplied:

(a) The maximum **Demand** that could occur at the **Interface Point** and each **Connection Point** (in MW and MVAr);

(b) **Demand** at specified time of annual peak half hour of **National Electricity Transmission System Demand** at **Annual ACS Conditions** (in MW and MVAr); and

(c) **Demand** at specified time of annual minimum half-hour of **National Electricity Transmission System Demand** (in MW and MVAr).

For the avoidance of doubt, **Demand** data associated with **Generators** undertaking **OTSDUW** which utilise an **OTSDUW DC Converter** should supply data under PC.A.4.

PC.A.5.3 Synchronous Power Generating Modules, Synchronous Generating Unit and Associated Control System Data

PC.A.5.3.1 The data submitted below are not intended to constrain any **Ancillary Services Agreement**

PC.A.5.3.2 The following **Synchronous Generating Unit** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**) and **Power Station** data should be supplied:

(a) **Synchronous Generating Unit** Parameters

Rated terminal volts (kV)

Maximum terminal voltage set point (kV)

Terminal voltage set point step resolution – if not continuous (kV)

* Rated MVA

* **Rated MW**

* Minimum Generation MW

* Short circuit ratio

Direct axis synchronous reactance

* Direct axis transient reactance

Direct axis sub-transient reactance

Direct axis short-circuit transient time constant

Direct axis short-circuit sub-transient time constant

Quadrature axis synchronous reactance

Quadrature axis sub-transient reactance

Quadrature axis short-circuit sub-transient time constant.

Stator time constant

Stator leakage reactance

Armature winding direct-current resistance.

Note: The above data item relating to armature winding direct-current resistance need only be supplied with respect to **Generating Units** commissioned after 1st March 1996 and in cases where, for whatever reason, the **Generator** or the **Network Operator**, as the case may be is aware of the value of the relevant parameter.

* Turbogenerator inertia constant (MWsec/MVA)

Rated field current (amps) at **Rated MW** and MVAr output and at rated terminal voltage.

Field current (amps) open circuit saturation curve for **Generating Unit** terminal voltages ranging from 50% to 120% of rated value in 10% steps as derived from appropriate manufacturers test certificates.

(b) Parameters for **Generating Unit** Step-up Transformers

* Rated MVA

Voltage ratio

* Positive sequence reactance (at max, min, & nominal tap)

Positive sequence resistance (at max, min, & nominal tap)

Zero phase sequence reactance

Tap changer range

Tap changer step size

Tap changer type: on load or off circuit

(c) Excitation Control System parameters

Note: The data items requested under Option 1 below may continue to be provided in relation to **Generating Units** connected to the **System** at 09 January 1995 (in this paragraph, the "relevant date") or the new data items set out under Option 2 may be provided. **Generators** or **Network Operators**, as the case may be, must supply the data as set out under Option 2 (and not those under Option 1) for **Generating Unit** excitation control systems commissioned after the relevant date, those **Generating Unit** excitation control systems recommissioned for any reason such as refurbishment after the relevant date and **Generating Unit** excitation control systems where, as a result of testing or other process, the **Generator** or **Network Operator**, as the case may be, is aware of the data items listed under Option 2 in relation to that **Generating Unit**.

For any excitation control systems associated with a **Generating Unit** or **Synchronous Power Generating Module** with a **Completion Date** after 1 September 2022 and any **Generating Unit** or **Synchronous Power Generating Module** excitation control systems subject to a control system change or **Modification** after 1 September 2022, the **Generator** should supply the control system model in accordance with PC.A.9. For the avoidance of doubt, excitation control system models as detailed in PC.A.9 maybe submitted for any **Generating Unit** regardless of **Completion Date** as an alternative to block diagrams detailed below. The control system model of the **Excitation System** shall include but not limited to, the **PSS** if fitted, **Over-excitation Limiter**, **Under-excitation Limiter** and should have been verified as far as reasonably practicable by simulation studies as representing the expected behaviour of the control system. Additionally the data items listed under Option 2 below are also required.

Option 1

DC gain of Excitation Loop

Rated field voltage

Maximum field voltage

Minimum field voltage

Maximum rate of change of field voltage (rising)

Maximum rate of change of field voltage (falling)

Details of Excitation Loop described in block diagram form showing transfer functions of individual elements.

Dynamic characteristics of **Over-excitation Limiter**

Dynamic characteristics of **Under-excitation Limiter**

Option 2

**Excitation System Nominal Response**

**Rated Field Voltage**

**No-Load Field Voltage**

**Excitation System On-Load Positive Ceiling Voltage**

**Excitation System No-Load Positive Ceiling Voltage**

**Excitation System No-Load Negative Ceiling Voltage**

Stator Current Limiter (applicable only to **Synchronous Power Generating Modules**)

Details of **Excitation System** (including **PSS** if fitted) described in block diagram form showing transfer functions of individual elements.

Details of **Over-excitation Limiter** described in block diagram form showing transfer functions of individual elements.

Details of **Under-excitation Limiter** described in block diagram form showing transfer functions of individual elements.

The block diagrams submitted after 1 January 2009 in respect of the **Excitation System** (including the **Over-excitation Limiter** and the **Under-excitation Limiter**) for **Generating Units** with a **Completion date** after 1 January 2009 or subject to a **Modification** to the **Excitation System** after 1 January 2009, should have been verified as far as reasonably practicable by simulation studies as representing the expected behaviour of the system.

(d) Governor Parameters

Incremental **Droop** values (in %) are required for each **Generating Unit** at six MW loading points (MLP1 to MLP6) as detailed in PC.A.5.5.1 (this data item needs only be provided for **Large Power Stations**).

Note: The data items requested under Option 1 below may continue to be provided by **Generators** in relation to **Generating Units** on the **System** at 09 January 1995 (in this paragraph, the "relevant date") or they may provide the new data items set out under Option 2. **Generators** must supply the data as set out under Option 2 (and not those under Option 1) for **Generating Unit** governor control systems commissioned after the relevant date, those **Generating Unit** governor control systems recommissioned for any reason such as refurbishment after the relevant date and **Generating Unit** governor control systems where, as a result of testing or other process, the **Generator** is aware of the data items listed under Option 2 in relation to that **Generating Unit**. **EU Generators** are also required to submit the data as set out in option 2. Additional data required from **EU Generators** which own or operate **Type C** or **Type D Power Generating Modules** are marked in brackets with an asterisk (eg (*)). For the avoidance of doubt, items marked as (*) need not be supplied by **GB Generators**.

For any governor control systems associated with a **Generating Unit** or **Synchronous Power Generating Module** with a **Completion Date** after 1 September 2022 and any **Generating Unit** or **Synchronous Power Generating Module** governor control systems subject to a control system change or **Modification** after 1 September 2022, the **Generator** should supply the control system model in accordance with PC.A.9. For the avoidance of doubt, governor control system models as detailed in PC.A.9 maybe submitted for any **Generating Unit** regardless of **Completion Date** as an alternative to governor block diagrams. The control system model shall include but not limited to, the governor and prime mover dynamics such as steam flow, boiler, water flow which could impact on representation of the requirements required by the Grid Code. Additional the data items listed under Option 2 are also required.

Option 1

(i) Governor Parameters (for Reheat **Steam Units**)

HP governor average gain MW/Hz

Speeder motor setting range

HP governor valve time constant

HP governor valve opening limits

HP governor valve rate limits

Reheater time constant (**Active Energy** stored in reheater)

IP governor average gain MW/Hz

IP governor setting range

IP governor valve time constant

IP governor valve opening limits

IP governor valve rate limits

Details of acceleration sensitive elements in HP & IP governor loop.

A governor block diagram showing transfer functions of individual elements.

(ii) Governor Parameters (for Non-Reheat **Steam Units** and **Gas Turbine Units**)

Governor average gain

Speeder motor setting range

Time constant of steam or fuel governor valve

Governor valve opening limits

Governor valve rate limits

Time constant of turbine

Governor block diagram

The following data items need only be supplied for **Large Power Stations**:

(iii) Boiler & Steam Turbine Data

Boiler Time Constant (Stored **Active Energy**) s

HP turbine response ratio:

proportion of **Primary Response** arising from HP turbine %

HP turbine response ratio:

proportion of High Frequency Response arising from HP turbine %

[End of Option 1]

Option 2

(i) Governor and associated prime mover Parameters - All **Generating Units** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**)

Governor Block Diagram showing transfer function of individual elements including acceleration sensitive elements.

Governor Time Constant (in seconds)

**Speeder Motor Setting Range** (%)

Average Gain (MW/Hz)

**Governor Deadband** need only be provided for **Large Power Stations** owned and operated by **GB Generators** (and both **Frequency Response Deadband** and **Frequency Response Insensitivity** should be supplied in respect of **Type C** and **D Power Generating Modules** within **Large Power Stations** and **Medium Power Stations** excluding **Embedded Medium Power Stations** not subject to a **Bilateral Agreement***) owned and oprated by **EU Code Generators**.

- Maximum Setting ±Hz

- Normal Setting ±Hz

- Minimum Setting ±Hz

Where the **Generating Unit** governor does not have a selectable **Governor Deadband** (or **Frequency Response Deadband** and **Frequency Response Insensitivity**)* facility as specified above, then the actual value of the **Governor Deadband** or (**Frequency Response Deadband** and **Frequency Response Insensitivity**)* need only be provided.

The block diagrams submitted after 1 January 2009 in respect of the governor system for **Generating Units** with a **Completion date** after 1 January 2009 or subject to a **Modification** to the governor system after 1 January 2009, should have been verified as far as reasonably practicable by simulation studies as representing the expected behaviour of the system.

(ii) Governor and associated prime mover Parameters - **Steam Units**

HP Valve Time Constant (in seconds)

HP Valve Opening Limits (%)

HP Valve Opening Rate Limits (%/second)

HP Valve Closing Rate Limits (%/second)

HP Turbine Time Constant (in seconds)

IP Valve Time Constant (in seconds)

IP Valve Opening Limits (%)

IP Valve Opening Rate Limits (%/second)

IP Valve Closing Rate Limits (%/second)

IP Turbine Time Constant (in seconds)

LP Valve Time Constant (in seconds)

LP Valve Opening Limits (%)

LP Valve Opening Rate Limits (%/second)

LP Valve Closing Rate Limits (%/second)

LP Turbine Time Constant (in seconds)

Reheater Time Constant (in seconds)

Boiler Time Constant (in seconds)

HP Power Fraction (%)

IP Power Fraction (%)

(iii) Governor and associated prime mover Parameters - **Gas Turbine Units**

Inlet Guide Vane Time Constant (in seconds)

Inlet Guide Vane Opening Limits (%)

Inlet Guide Vane Opening Rate Limits (%/second)

Inlet Guide Vane Closing Rate Limits (%/second)

Fuel Valve Constant (in seconds)

Fuel Valve Opening Limits (%)

Fuel Valve Opening Rate Limits (%/second)

Fuel Valve Closing Rate Limits (%/second)

Waste Heat Recovery Boiler Time Constant (in seconds)

(iv) Governor and associated prime mover Parameters - Hydro Generating Units

Guide Vane Actuator Time Constant (in seconds)

Guide Vane Opening Limits (%)

Guide Vane Opening Rate Limits (%/second)

Guide Vane Closing Rate Limits (%/second)

Water Time Constant (in seconds)

(v) Governor Parameters – Synchronous Electricity Storage Units

For **Synchronous Electricity Storage Modules** which are derived from compressed air energy storage systems, the following data should be provided.

For other **Synchronous Electricity Storage Modules**, data should be supplied as required by **The Company** in accordance with PC.A.7

Valve Actuator Time Constant (in seconds)

Valve Opening Limits (%)

Valve Opening Rate Limits (%/second)

Valve Closing Rate Limits (%/second)

[End of Option 2]

(e) Unit Control Options

The following data items need only be supplied with respect to **Large Power Stations**:

Maximum **Droop** %

Normal **Droop** %

Minimum **Droop** %

Maximum **Governor Deadband** or (maximum **Frequency Response Deadband** and maximum **Frequency Response Insensitivity***) ±Hz

Normal **Governor Deadband** or (normal **Frequency Response Deadband** and normal **Frequency Response Insensitivity***) ±Hz

Minimum **Governor Deadba**nd or (minimum **Frequency Response Deadband** and minimum **Frequency Response Insensitivity***) ±Hz

Maximum output **Governor Deadband** (or maximum output **Frequency Response Deadband** and maximum **Frequency Response Insensitivity***) ±MW

Normal output **Governor Deadband** (or normal output **Frequency Response Deadband** and normal output **Frequency Response Insensitivity***) ±MW

Minimum output **Governor Deadband** or (minimum output **Frequency Response Deadband** and minimum output **Frequency Response Insensitivity***) ±MW

**Frequency** settings between which Unit Load Controller **Droop** applies:

- Maximum Hz
- Normal Hz
- Minimum Hz

State if sustained response is normally selected.

(* **GB Generators** which are not required to satisfy the requirements of the **European Connection Conditions** are not required to supply **Frequency Response Insensitivity** or **Frequency Response Deadband** data but should instead supply **Governor Deadband** data). For the avoidance of doubt, **EU Code Generators** in respect of **Type C** and **Type D Power Generating Modules** are required to supply **Frequency Response Deadband** and **Frequency Response Insensitity** data).

(f) Plant Flexibility Performance

The following data items need only be supplied with respect to **Large Power Stations**, and should be provided with respect to each **Genset**:

# Run-up rate to **Registered Capacity**,

# Run-down rate from **Registered Capacity**,

# **Synchronising Generation**,

Regulating range

Load rejection capability while still **Synchronised** and able to supply **Load**.

Data items marked with a hash (#) should be applicable to a **Genset** which has been **Shutdown** for 48 hours.

* Data items marked with an asterisk are already requested under partx1, PC.A.3.3.1, to facilitate an early assessment by **The Company** as to whether detailed stability studies will be required before an offer of terms for a **CUSC Contract** can be made. Such data items have been repeated here merely for completeness and need not, of course, be resubmitted unless their values, known or estimated, have changed.

(g) Generating Unit Mechanical Parameters

It is occasionally necessary for **The Company** to assess the interaction between the **Total System** and the mechanical components of **Generating Units**. For **Generating Units** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**) with a **Completion Date** on or after 01 April 2015,

or;

with a **Completion Date** before 01 April 2015 when requested by **The Company** in accordance with good industry practice and without undue delay,

the following data items should be supplied:

The number of turbine generator masses.

Diagram showing the Inertia and parameters for each turbine generator mass ($kgm^2$) and Stiffness constants and parameters between each turbine generator mass for the complete drive train (Nm/rad).

Number of poles.

Relative power applied to different parts of the turbine (%).

Torsional mode frequencies (Hz).

Modal damping decrement factors for the different mechanical modes.

PC.A.5.4 Power Park Module, Non-Synchronous Generating Unit and Associated Control System Data

PC.A.5.4.1 The data submitted below are not intended to constrain any **Ancillary Services Agreement**

PC.A.5.4.2 The following **Power Park Unit**, **Power Park Module** and **Power Station** data should be supplied in the case of a **Power Park Module** not connected to the **Total System** by a **DC Converter** or **HVDC System** (and in the case of PC.A.5.4.2(f) any **OTSUA**):

Where a **Manufacturer's Data & Performance Report** exists in respect of the model of the **Power Park Unit**, the **User** may subject to **The Company's** agreement, opt to reference the **Manufacturer's Data & Performance Report** as an alternative to the provision of data in accordance with PC.A.5.4.2 except for:

(1) the section marked thus # at sub paragraph (b); and

(2) all of the harmonic and flicker parameters required under sub paragraph (h); and

(3) all of the site specific model parameters relating to the voltage or frequency control systems required under sub paragraphs (d) and (e),

which must be provided by the **User** in addition to the **Manufacturer's Data & Performance Report** reference.

(a) **Power Park Unit** model

A mathematical model of each type of **Power Park Unit** (including **Electricity Storage Units**) capable of representing its transient and dynamic behaviour under both small and large disturbance conditions. The model shall include non-linear effects and represent all equipment relevant to the dynamic performance of the **Power Park Unit** as agreed with **The Company**. The model shall be suitable for the study of balanced, root mean square, positive phase sequence time-domain behaviour, excluding the effects of electromagnetic transients, harmonic and sub-harmonic frequencies.

The model shall accurately represent the overall performance of the **Power Park Unit** over its entire operating range including that which is inherent to the **Power Park Unit** and that which is achieved by use of supplementary control systems providing either continuous or stepwise control. Model resolution should be sufficient to accurately represent **Power Park Unit** behaviour both in response to operation of **Transmission System** protection and in the context of longer-term simulations.

The overall structure of the model shall include:

(i) any supplementary control signal modules not covered by (c), (d) and (e) below.

(ii) any blocking, deblocking and protective trip features that are part of the **Power Park Unit** (e.g. “crowbar”).

(iii) any other information required to model the **Power Park Unit** behaviour to meet the model functional requirement described above.

The model shall be submitted in the form of a transfer function block diagram and may be accompanied by dynamic and algebraic equations.

This model shall display all the transfer functions and their parameter values, any non wind-up logic, signal limits and non-linearities.

The submitted **Power Park Unit** model and the supplementary control signal module models covered by (c), (d) and (e) below shall have been validated and this shall be confirmed by the **Generator**. The validation shall be based on comparing the submitted model simulation results against measured test results. Validation evidence shall also be submitted and this shall include the simulation and measured test results. The latter shall include appropriate short-circuit tests. In the case of an **Embedded Medium Power Station** not subject to a **Bilateral Agreement** the **Network Operator** will provide **The Company** with the validation evidence if requested by **The Company**. The validation of the supplementary control signal module models covered by (c), (d) and (e) below applies only to a **Power Park Module** with a **Completion Date** after 1 January 2009 or **Power Park Modules** within a **Power Generating Module**.

(b) **Power Park Unit** parameters

* Rated MVA
* **Rated MW**
* Rated terminal voltage
* Average site air density (kg/m$^3$), maximum site air density (kg/m$^3$) and minimum site air density (kg/m$^3$) for the year (as applicable)

  Year for which the air density is submitted (as applicable)

  Number of pole pairs (as applicable)

  Blade swept area (m$^2$) (as applicable)

  Gear box ratio (as applicable)

  Mechanical drive train (as applicable)

  For each **Power Park Unit**, details of the parameters of the drive train (as applicable) represented as an equivalent two mass model should be provided. This model should accurately represent the behaviour of the complete drive train for the

purposes of power system analysis studies and should include the following data items:-

Equivalent inertia constant (MWsec/MVA) of the first mass (e.g. wind turbine rotor and blades) at minimum, synchronous and rated speeds

Equivalent inertia constant (MWsec/MVA) of the second mass (e.g. generator rotor) at minimum, synchronous and rated speeds

Equivalent shaft stiffness between the two masses (Nm/electrical radian)

Additionally, for **Power Park Units** that are induction generators (e.g. squirrel cage, doubly-fed) driven by wind turbines:

* Stator resistance
* Stator reactance
* Magnetising reactance.
* Rotor resistance.(at starting)
* Rotor resistance.(at rated running)
* Rotor reactance (at starting)
* Rotor reactance (at rated running)

Additionally for doubly-fed induction generators only:

The generator rotor speed range (minimum and maximum speeds in RPM)

The optimum generator rotor speed versus wind speed submitted in tabular format

Power converter rating (MVA)

The rotor power coefficient ($C_p$) versus tip speed ratio ($\lambda$) curves for a range of blade angles (where applicable) together with the corresponding values submitted in tabular format. The tip speed ratio ($\lambda$) is defined as $\Omega R/U$ where $\Omega$ is the angular velocity of the rotor, R is the radius of the wind turbine rotor and U is the wind speed.

The electrical power output versus generator rotor speed for a range of wind speeds over the entire operating range of the **Power Park Unit**, together with the corresponding values submitted in tabular format.

The blade angle versus wind speed curve together with the corresponding values submitted in tabular format.

The electrical power output versus wind speed over the entire operating range of the **Power Park Unit**, together with the corresponding values submitted in tabular format.

Transfer function block diagram, including parameters and description of the operation of the power electronic converter and fault ride through capability (where applicable). For any **Power Park Unit**s in a **Power Park Module** with a **Completion Date** after 1 September 2022 and any **Power Park Units** subject to a control system change or **Modification** after 1 September 2022 control system models in accordance with PC.A.9 should be supplied. For the avoidance of doubt, a **User** may submit control system models as detailed in PC.A.9 for any **Power Park Unit** regardless of **Power Park Module Completion Date** as an alternative to this paragraph.

For a **Power Park Unit** consisting of a synchronous machine in combination with a back to back **DC Converter** or **HVDC System**, or for a **Power Park Unit** not driven by a wind turbine, the data to be supplied shall be agreed with **The Company** in accordance with PC.A.7.

(c) Torque / speed and blade angle control systems and parameters

For the type of **Power Park Unit** (as applicable), details of the torque / speed controller and blade angle controller in the case of a wind turbine and power limitation functions (where applicable) described in block diagram form showing transfer functions and parameters of individual elements.

(d) Voltage/**Reactive Power**/**Power Factor** control system parameters

For the **Power Park Unit** and **Power Park Module** details of voltage/**Reactive Power**/**Power Factor** controller (and **PSS** if fitted) described in block diagram form showing transfer functions and parameters of individual elements.

(e) **Frequency** control system parameters

For the **Power Park Unit** and **Power Park Module** details of the **Frequency** controller described in block diagram form showing transfer functions and parameters of individual elements.

(f) **Protection**

Details of settings for the following **Protection** relays (to include): Under **Frequency**, over **Frequency**, under voltage, over voltage, rotor over current, stator over current, high wind speed shut down level.

(g) Complete **Power Park Unit** model, parameters and controls

(i) For any **Power Park Unit**s in a **Power Park Module** with a **Completion Date** after 1 September 2022 and any **Power Park Units** and/or **Power Park Module(s)** subject to a control system change or **Modification** after 1 September 2022, control system models in accordance with PC.A.9 should be supplied covering the full information required under PC.A.5.4.2 (a), (b), (c), (d), (e) and (f).

(ii) For any **Power Park Units** in a **Power Park Module** with a **Completion Date** before 1 September 2022 as an alternative to PC.A.5.4.2 (a), (b), (c), (d), (e) and (f), is the submission of a single complete model that consists of the full information required under PC.A.5.4.2 (a), (b), (c), (d), (e) and (f) provided that all the information required under PC.A.5.4.2 (a), (b), (c), (d), (e) and (f) individually is clearly identifiable. For the avoidance of doubt, a **User** may submit control system models as detailed in PC.A.9 for any **Power Park Unit** or **Power Park Module** regardless of **Completion Date** as an alternative to this clause.

(h) Harmonic and flicker parameters

When connecting a **Power Park Module**, it is necessary for **The Company** to evaluate the production of flicker and harmonics on the **National Electricity Transmission System** and **User's Systems**. At **The Company's** reasonable request, the **User** (a **Network Operator** in the case of an **Embedded Power Park Module** not subject to a **Bilateral Agreement**) is required to submit the following data (as defined in IEC 61400-21 (2001)) for each **Power Park Unit**:-

Flicker coefficient for continuous operation.

Flicker step factor.

Number of switching operations in a 10 minute window.

Number of switching operations in a 2 hour window.

Voltage change factor.

Current Injection at each harmonic for each **Power Park Unit** and for each **Power Park Module**.

* Data items marked with an asterisk are already requested under part 1, PC.A.3.3.1, to facilitate an early assessment by **The Company** as to whether detailed stability studies will be required before an offer of terms for a **CUSC Contract** can be made. Such data items have been repeated here merely for completeness and need not, of course, be resubmitted unless their values, known or estimated, have changed.

PC.A.5.4.3 DC Converter and HVDC Systems

PC.A.5.4.3.1 For a **DC Converter** at a **DC Converter Station** or an **HVDC System** connected to the **Total System** by a **DC Converter** or **HVDC System** (or in the case of **OTSUA** which includes an **OTSDUW DC Converter**) the following information for each **DC Converter**, **HVDC System** and **DC Network** should be supplied:

(a) **DC Converter** and **HVDC System** parameters

* **Rated MW** per pole for transfer in each direction;
* **DC Converter** type (i.e. current or voltage source (including a **HVDC Converter** in an **HVDC System**));
* Number of poles and pole arrangement;
* Rated DC voltage/pole (kV);
* Return path arrangement;

(b) **DC Converter** and **HVDC System** transformer parameters

Rated MVA

Nominal primary voltage (kV);

Nominal secondary (converter-side) voltage(s) (kV);

Winding and earthing arrangement;

Positive phase sequence reactance at minimum, maximum and nominal tap;

Positive phase sequence resistance at minimum, maximum and nominal tap;

Zero phase sequence reactance;

Tap-changer range in %;

number of tap-changer steps;

(c) **DC Network** parameters

Rated DC voltage per pole;

Rated DC current per pole;

Single line diagram of the complete **DC Network** and **HVDC System**;

Details of the complete **DC Network**, including resistance, inductance and capacitance of all DC cables and/or DC lines and **HVDC System**;

Details of any DC reactors (including DC reactor resistance), DC capacitors and/or DC-side filters that form part of the **DC Network** and/or **HVDC System**;

(d) AC filter reactive compensation equipment parameters

Note: The data provided pursuant to this paragraph must not include any contribution from reactive compensation plant.

Total number of AC filter banks.

Type of equipment (e.g. fixed or variable)

Single line diagram of filter arrangement and connections;

**Reactive Power** rating for each AC filter bank, capacitor bank or operating range of

each item of reactive compensation equipment, at rated voltage;

Performance chart showing **Reactive Power** capability of the **DC Converter** and **HVDC System**, as a function of MW transfer, with all filters and reactive compensation plant, belonging to the **DC Converter Station** or **HVDC System** working correctly.

Note: Details in PC.A.5.4.3.1 are required for each **DC Converter** connected to the **DC Network** and **HVDC System**, unless each is identical or where the data has already been submitted for an identical **DC Converter** or **HVDC System** at another **Connection Point**.

Note: For a **Power Park Module** and **DC Connected Power Park Module** connected to the **Grid Entry Point** or (**User System Entry Point** if **Embedded**) by a **DC Converter** or **HVDC System** the equivalent inertia and fault infeed at the **Power Park Unit** should be given.

DC Converter and HVDC System Control System Models

PC.A.5.4.3.2 The following data is required by **The Company** to represent **DC Converters** and associated **DC Networks** and **HVDC Systems** (and including **OTSUA** which includes an **OTSDUW DC Converter**) in dynamic power system simulations,

(a) For any any **DC Converters** and **HVDC Systems** with a **Completion Date** before 1 September 2022 in which the AC power system is typically represented by a positive sequence equivalent, it is acceptable to represent **DC Converters** and **HVDC Systems** by simplified equations rather than to the switching device level.

(i) Static $V_{DC}$-$I_{DC}$ (DC voltage - DC current) characteristics, for both the rectifier and inverter modes for a current source converter. Static $V_{DC}$-$P_{DC}$ (DC voltage - DC power) characteristics, for both the rectifier and inverter modes for a voltage source converter. Transfer function block diagram including parameters representation of the control systems of each **DC Converter** and of the **DC Converter Station** and the **HVDC System**, for both the rectifier and inverter modes. A suitable model would feature the **DC Converter** or **HVDC Converter** firing angle as the output variable.

(ii) Transfer function block diagram representation including parameters of the **DC Converter** or **HVDC Converter** transformer tap changer control systems, including time delays

(iii) Transfer function block diagram representation including parameters of AC filter and reactive compensation equipment control systems, including any time delays.

(iv) Transfer function block diagram representation including parameters of any **Frequency** and/or load control systems.

(v) Transfer function block diagram representation including parameters of any small signal modulation controls such as power oscillation damping controls or sub-synchronous oscillation damping controls, that have not been submitted as part of the above control system data.

(vi) Transfer block diagram representation of the **Reactive Power** control at converter ends for a voltage source converter.

In addition and where not provided for above, **HVDC System Owners** and **Generators** in respect of **OTSDUW DC Converters** who are also **EU Code Users** shall also provide the following dynamic simulation sub-models

(i) **HVDC Converter** unit models

(ii) AC component models

(iii) DC Grid models

(iv) Voltage and power controller

(v) Special control features if applicable (eg power oscillation damping (POD) function, subsynchronous torsional interaction (SSTI) control;

(vi) Multi terminal control, if applicable

(vii) **HVDC System** protection models as agreed between **The Company** and the **HVDC System Owner**

**HVDC System Owners** are also required to supply an equivalent model of the control system when adverse control interactions may result with **HVDC Converter Stations** and other connections in close proximity if requested by **The Company**. The equivalent model shall contain all necessary data for the realistic simulation of the adverse control interactions.

(b) For any **DC Converters** and **HVDC Systems** with a **Completion Date** after 1 September 2022 and any **DC Converters** and **HVDC Systems** subject to a control system change or **Modification** after 1 September 2022, control system models in accordance with PC.A.9 should be supplied covering the full functionality required under PC.A.5.4.3.2 (a).

For the avoidance of doubt a **User** may submit control system models as detailed in PC.A.9 for any **DC Converters** and **HVDC Systems** regardless of **Completion Date** as an alternative to PC.A.5.4.3.2(a).

Plant Flexibility Performance

PC.A.5.4.3.3 The following information on plant flexibility and performance should be supplied (and also in respect of **OTSUA** which includes an **OTSDUW DC Converter**):

(i) Nominal and maximum (emergency) loading rate with the **DC Converter** or **HVDC Converter** in rectifier mode.

(ii) Nominal and maximum (emergency) loading rate with the **DC Converter** or **HVDC Converter** in inverter mode.

(iii) Maximum recovery time, to 90% of pre-fault loading, following an AC system fault or severe voltage depression.

(iv) Maximum recovery time, to 90% of pre-fault loading, following a transient **DC Network** fault.

Harmonic Assessment Information

PC.A.5.4.3.4 **DC Converter** owners and **HVDC System Owners** shall provide such additional further information as required by **The Company** in order that compliance with CC.6.1.5 or ECC.6.1.5 can be demonstrated.

* Data items marked with an asterisk are already requested under part 1, PC.A.3.3.1, to facilitate an early assessment by **The Company** as to whether detailed stability studies will be required before an offer of terms for a **CUSC Contract** can be made. Such data items have been repeated here merely for completeness and need not, of course, be resubmitted unless their values, known or estimated, have changed.

PC.A.5.5 Response Data For Frequency Changes

The information detailed below is required to describe the actual frequency response capability profile as illustrated in Figure CC.A.3.1 of the **Connection Conditions** or Figure ECC.A.3.1 of the **European Connection Conditions**, and need only be provided for each:

(i) **Genset** at **Large Power Stations**; and

(ii) **Generating Unit** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**), **Power Park Module** (including a **DC Connected Power Park Module**) or **CCGT Module** at a **Medium Power Station** or **DC Converter Station** or **HVDC System** that has agreed to provide **Frequency** response in accordance with a **CUSC Contract**.

In the case of (ii) above for the rest of this PC.A.5.5 where reference is made to **Gensets**, it shall include such **Generating Units** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**), **CCGT Modules**, **Power Park Modules** (including **DC Connected Power Park Module**s), **HVDC Systems** and **DC Converters** as appropriate, but excludes **OTSDUW Plant and Apparatus** utilising **OTSDUW DC Converters**.

In this PC.A.5.5, for a **CCGT Module** with more than one **Generating Unit**, the phrase **Minimum Generation** or **Minimum Regulating Level** applies to the entire **CCGT Module** operating with all **Generating Units** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**) **Synchronised** to the **System**. Similarly for a **Power Park Module** (including a **DC Connected Power Park Module**) with more than one **Power Park Unit**, the phrase **Minimum Generation** or **Minimum Regulating Level** applies to the entire **Power Park Module** operating with all **Power Park Units Synchronised** to the **System**.

PC.A.5.5.1 MW Loading Points At Which Data Is Required

Response values are required at six MW loading points (MLP1 to MLP6) for each **Genset**. **Primary** and **Secondary Response** values need not be provided for MW loading points which are below **Minimum Generation** or **Minimum Stable Operating Level**. MLP1 to MLP6 must be provided to the nearest MW.

Prior to the **Genset** being first **Synchronised**, the MW loading points must take the following values :

| | |
|---|---|
| MLP1 | **Designed Minimum Operating Level** or **Minimum Regulating Level** |
| MLP2 | **Minimum Generation** or **Minimum Stable Operating Level** |
| MLP3 | 70% of **Registered Capacity** or **Maximum Capacity** |
| MLP4 | 80% of **Registered Capacity** or **Maximum Capacity** |
| MLP5 | 95% of **Registered Capacity** or **Maximum Capacity** |
| MLP6 | **Registered Capacity** or **Maximum Capacity** |

When data is provided after the **Genset** is first **Synchronised**, the MW loading points may take any value between the **Designed Minimum Operating Level** or **Minimum Regulating Level** and **Registered Capacity** or **Maximum Capacity** but the value of the **Designed Minimum Operating Level** or **Minimum Regulating Level** must still be provided if it does not form one of the MW loading points.

PC.A.5.5.2 Primary And Secondary Response To Frequency Fall

**Primary** and **Secondary Response** values for a -0.5Hz ramp are required at six MW loading points (MLP1 to MLP6) as detailed above

PC.A.5.5.3 High Frequency Response To Frequency Rise

**High Frequency Response** values for a +0.5Hz ramp are required at six MW loading points (MLP1 to MLP6) as detailed above.

PC.A.5.5.4 Each **Generator** or **Defence Service Provider** or **Restoration Contractor** or **Non-Embedded Customer** in respect of an **Electricity Storage Module**, shall provide **Frequency** response curves that demonstrate the ability of their **Electricity Storage Modules** to transition from a mode analogous to **Demand** to a mode analogous to generation (excluding **Auxiliary Supplies**) within a period of 20 seconds or less in accordance with the requirements of ECC.6.3.7.2.3, unless the provisions of ECC.6.3.7.2.3.1 apply where the requirements of OC6.6.6. relate.

PC.A.5.6 Mothballed Power Generating Module, Mothballed Generating Unit, Mothballed Power Park Module (including DC Connected Power Park Modules), Mothballed HVDC Systems or Mothballed DC Converter at a DC Converter Station And Alternative Fuel Information

Data identified under this section PC.A.5.6 must be submitted as required under PC.A.1.2 and at **The Company's** reasonable request.

In the case of **Embedded Medium Power Stations** not subject to a **Bilateral Agreement, Embedded HVDC Systems** not subject to a **Bilateral Agreement** and **Embedded DC Converter Stations** not subject to a **Bilateral Agreement**, upon request from **The Company** each **Network Operator** shall provide the information required in PC.A.5.6.1, PC.A.5.6.2, PC.A.5.6.3 and PC.A.5.6.4 on respect of such **Embedded Medium Power Stations** and **Embedded DC Converters Stations** and **Embedded HVDC Systems** with their **System**.

PC.A.5.6.1 Mothballed Generating Unit Information

**Generators**, **HVDC System Owners** and **DC Converter Station** owners must supply with respect to each **Mothballed Power Generating Module**, **Mothballed Generating Unit**, **Mothballed Power Park Module** (including a **DC Connected Power Park Module**), **Mothballed HVDC System** or **Mothballed DC Converter** at a **DC Converter Station** the estimated **MW** output which could be returned to service within the following time periods from the time that a decision to return was made:

< 1 month;

1-2 months;

2-3 months;

3-6 months;

6-12 months; and

>12 months.

The return to service time should be determined in accordance with **Good Industry Practice** assuming normal working arrangements and normal plant procurement lead times. The MW output values should be the incremental values made available in each time period as further described in the **DRC**.

PC.A.5.6.2 **Generators**, **HVDC System Owners** and **DC Converter Station** owners must also notify **The Company** of any significant factors which may prevent the **Mothballed Power Generating Module**, **Mothballed Generating Unit**, **Mothballed Power Park Module** (including **DC Connected Power Park Modules**), **Mothballed HVDC Systems** or **Mothballed DC Converter** at a **DC Converter Station** achieving the estimated values provided under PC.A.5.6.1 above, excluding factors relating to **Transmission Entry Capacity**.

PC.A.5.6.3 Alternative Fuel Information

The following data items must be supplied with respect to each **Generating Unit** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**) whose main fuel is gas.

For each alternative fuel type (if facility installed):

(a) Alternative fuel type e.g. oil distillate, alternative gas supply

(b) For the changeover from main to alternative fuel:

- Time to carry out off-line and on-line fuel changeover (minutes).
- Maximum output following off-line and on-line changeover (MW).
- Maximum output during on-line fuel changeover (MW).
- Maximum operating time at full load assuming typical and maximum possible stock levels (hours).
- Maximum rate of replacement of depleted stocks (MWh electrical/day) on the basis of **Good Industry Practice**.
- Is changeover to alternative fuel used in normal operating arrangements?

- Number of successful changeovers carried out in the last of **The Company's Financial Year** (choice of 0, 1-5, 6-10, 11-20, >20).

(c) For the changeover back to main fuel:

- Time to carry out off-line and on-line fuel changeover (minutes).
- Maximum output during on-line fuel changeover (MW).

PC.A.5.6.4 **Generators** must also notify **The Company** of any significant factors and their effects which may prevent the use of alternative fuels achieving the estimated values provided under PC.A.5.6.3 above (e.g. emissions limits, distilled water stocks etc.)

PC.A.5.7 System Restoration Related Information

PC.A.5.7.1 Data identified under this section PC.A.5.7.1 must be submitted as required under PC.A.1.2. This information may also be requested by **The Company** during **System Restoration** and should be provided by **Generators**, **HVDC System Owners** and **DC Converter Station Owners** where reasonably possible. For the avoidance of doubt, **Generators** in this section PC.A.5.7.1 means each **Generator** in respect of their **BM Unit** at any directly connected **Power Station** or **Large Power Station** (excluding **Generators** in respect of **Embedded Medium Power Stations** and **Embedded Small Power Stations**).

The data items/text in (a) and (b) below must be supplied, by each **Generator** and **HVDC System Owner** and **DC Converter Station** owner to **The Company**. In the case of **Generators**, the data supplied should be with respect to each **BM Unit** at any directly connected **Power Station** or **Large Power Station**. For the avoidance of doubt, the data required under PC.A.5.7.1(a) and (b) below, i) does not need to be supplied in respect of **Restoration Contractors Plant** and ii), only needs to be supplied in respect of each **BM Unit** at a **Large Power Station** or any directly connected **Power Station** and does not need to include **Generating Unit** data;

(a) The expected time for each **BM Unit** to be **Synchronised** following a **Total Shutdown** or **Partial Shutdown**. The assessment should include the **Power Stations** or **HVDC Systems** or **DC Converter Stations** ability to re-synchronise all **BM Units**, if all were running immediately prior to the **Total Shutdown** or **Partial Shutdown** once auxiliary supplies have been restored, or supplies have been restored to the **User's Site** where the **Plant** was running immediately prior to the **Shutdown**) and at time intervals of 12 hours, 24 hours, 36 hours, 48 hours and 72 hours before the **BM Unit** had been **Shutdown**. Additionally this should highlight any specific issues (i.e. those that would have an impact on the **BM Unit's** time to be **Synchronised**) that may arise, as time progresses without external supplies being restored or the availability of primary fuel supplies. In submitting this data, **Generators**, **HVDC System Owners** and **DC Converter Station** owners should be aware of the requirements in CC.7.11 or ECC.7.11.

(b) **Block Loading Capability**. This should be provided in either graphical or tabular format showing the estimated block loading capability from 0MW to **Registered Capacity** and the time between each incremental step. Any particular **Active Power** loading points at which the **BM Unit** should be operated until further changes in output can be accommodated should also be identified. The data of each **BM Unit** should be provided for the condition of a **Generating Unit** (which was running immediately prior to the **Shutdown**) and at time intervals of 12 hours, 24 hours, 36 hours, 48 hours and 72 hours before the **BM Unit** had been **Shutdown**. In the case of an **HVDC System** or **DC Converter Station**, data should be provided when the **HVDC System** or **DC Converter Station** (which was running immediately prior to the **Shutdown**) and at time intervals of 12 hours, 24 hours, 36 hours, 48 hours and 72 hours prior to the **HVDC System** or **DC Converter Station** had been **Shutdown**. The block loading assessment should be done against a frequency variation of 47.5Hz – 52Hz.

PC.A.5.7.2 Where a **Network Operator** has a **Distribution Restoration Zone Plan** in place, the data specified in this section shall be submitted as required under PC.A.1.2 by **Network Operators** to **The Company** annually by calendar week 28. This information may also be requested by **The Company** from the relevant **Network Operator** during **System Restoration** and should be provided by **Network Operators** where reasonably practicable. **Restoration Contractors** party to a **Distribution Restoration Zone Plan** shall, where reasonably practicable, submit the relevant information to the **Network Operator** who shall then supply the relevant information to **The Company**. The following data shall be provided;

(a) The expected time for each **Restoration Contractor's Plant** to **Re-Synchronise** to the **Network Operator's System** following a **Total Shutdown** or **Partial Shutdown**. The assessment should include the **Restoration Contractor's** ability to **Re-Synchronise** all their **Plant**, if all were running immediately prior to the **Total Shutdown** or **Partial Shutdown**. Additionally, the data and supporting text should highlight any specific issues (eg those that would affect the time before which the **Restoration Contractor's Plant** could be energised) that may arise as time progresses from **Shutdown** without external supplies being restored or the availability of primary fuel supplies..

(b) The **Restoration Contractor's Plants Block Loading Capability** as required in PC.A.5.7.1(b).

PC.A.5.7.3 From 31st December 2026 onwards, all **Users** and **Restoration Contractors** are required to confirm annually they comply with the applicable requirements of OC5.7. In the case of **Generators**, **HVDC System Owners**, **DC Converter** owners, **Non-Embedded Customers**, and **Network Operators** this confirmation shall be provided in their Week 24 submission. From 1st January 2024 until 31st December 2026, evidence to support the work **Generators**, **HVDC System Owners**, **DC Converter** owners, **Non-Embedded Customers**, and **Network Operators** are carrying out to achieve these requirements on or after 31st December 2026 shall be provided in their Week 24 submission.

PC.A.5.7.4 From 1st January 2025 onwards, **Restoration Contractors**, **Generators**, **HVDC System Owners** and **DC Converter** owners, shall supply the governor setting information in accordance with the applicable requirements of CC.6.3.7(g), (h) and (i) or ECC.6.3.7.3.8.

PC.A.5.8 Grid Forming Related Information

PC.A.5.8.1 The following data need only be supplied by **Users** (be they a **GB Code User** or **EU Code User**) or **Non-CUSC Parties** who wish to offer a **Grid Forming Capability** as provided for ECC.6.3.19.3. Where such a **Grid Forming Capability** is provided then the following data items and models are to be supplied.

(i) Each **GBGF-I** shall be designed so as not to interact and affect the operation, performance, safety or capability of other **User's Plant** and **Apparatus** connected to the **Total System**. To achieve this requirement, each **User** shall be required to submit a **Network Frequency Perturbation Plot** and **Nichols Chart** (or equivalent as agreed with **The Company**) which shall be assessed in accordance with the requirements of ECP.A.3.9.3.

Each **User** or **Non-CUSC Party** is required to supply a high level equivalent architecture diagram of their **Grid Forming Plant** as shown in Figure PC.A.5.8.1 together with the equivalent linear classical block diagram model (using the Laplace Operator) of their **Grid Forming Plant** which should preferably be in the general form shown in Figure PC.A.5.8.1 (a) or Figure PC.A.5.8.1 (b). When submitting either Figure PC.A.5.8.1 (a) or Figure PC.A.5.8.1 (b), each **User** or **Non-CUSC Party** can use their own design, that may be very different to Figures PC.A.5.8.1 (a) or PC.A.5.8.1 (b), but should contain all relevant functions that can include simulation models and other equivalent data and documentation.

Each **User** or **Non-CUSC Party** shall provide a model of their **Grid Forming Plant** which provides a true and accurate reflection of its **Grid Forming Capability**.

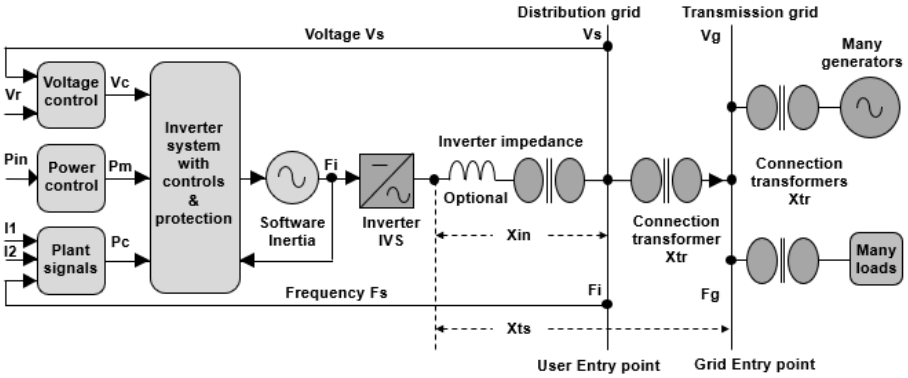



Figure PC.A.5.8.1

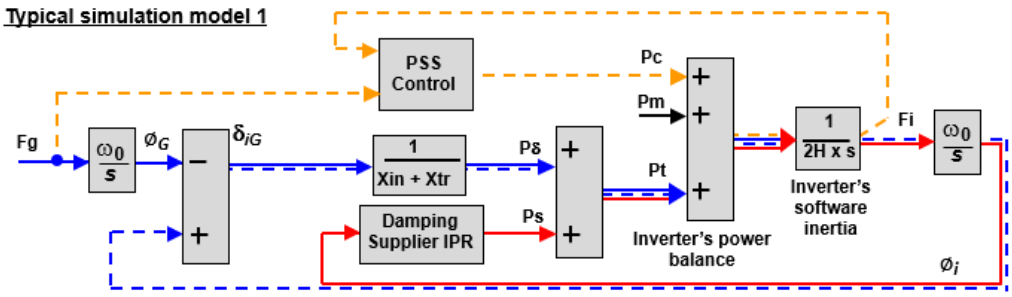



Figure PC.A.5.8.1 (a) Preferred simplified diagram of a **GBGF-I** with a **Power System Stabiliser** "**PSS**" that can add damping to the **GBGF-I**'s closed loop function shown by the solid red line and the dotted blue line.

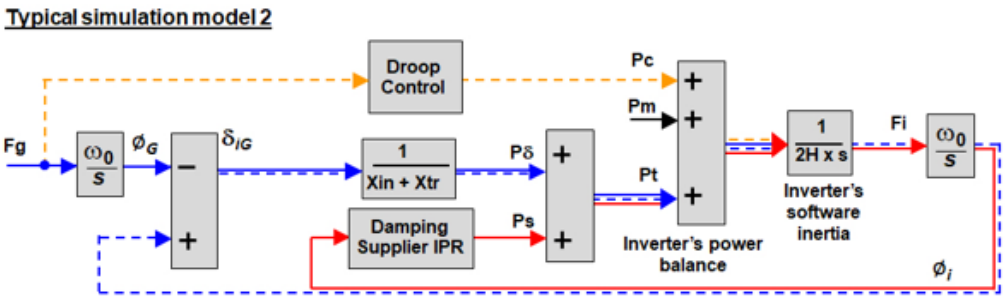



Figure PC.A.5.8.1 (b) – Preferred simplified diagram of a system with a droop control ability that can add **Control-Based Active Droop Power**. This diagram does not add extra closed loop damping to the **GBGF-I's** closed loop function shown by the solid red line and the dotted blue line.

(ii) In order to participate in the **Grid Forming Capability** market, **User's** and **Non-CUSC Parties** are required to provide data of their **GBGF-I** in accordance with Figures PC.A.5.8.1(a) and PC.A.5.8.1(b). **Users** and **Non-CUSC Parties** in respect of **Grid Forming Plants** should indicate if the data is submitted on a unit or aggregated basis. Table PC.A.5.8.1(a) defines the notation used in Figure PC.5.8.1

| Parameter | Symbol | Units |
|---|---|---|
| The primary reactance of the **Grid Forming Unit**, in pu. | Xin or Xts | pu on MVA **Rating of Grid Forming Unit** |
| The additional reactance, in pu, between the terminals of the **Grid Forming Unit** and the **Grid Entry Point** or **User System Entry Point** (if **Embedded**). | $X_{tr}$ | pu on MVA **Rating of Grid Forming Unit** |
| The rated angle between the **Internal Voltage Source** and the input terminals of the **Grid Forming Unit**. | | radians |
| The rated angle between the **Internal Voltage Source** and **Grid Entry Point** or **User System Entry Point** (if **Embedded**). | | radians |
| The rated voltage and phase of the **Internal Voltage Source** of the **Grid Forming Unit**. | | Voltage - pu<br>Phase - radians |
| The rated electrical angle between current and voltage at the input to the Grid transformer. | | radians |

Table PC.A.5.8.1

(iii) In order to participate in a **Grid Forming Capability** market, **User's** and **Non-CUSC Parties** are also required to provide the data of their **GBGF-I** in accordance with Table PC.A.5.8.1.2 to **The Company**. The details and arrangements for **Users** and **Non-CUSC Parties** participating in this market shall be published on **The Company's Website**.

| Quantity | Units | Range (where Applicable) | User Defined Parameter |
|---|---|---|---|
| Type of **Grid Forming Plant** (eg **Generating Unit**, **Electricity Storage Module**, **Dynamic Reactive Compensation Equipment** etc) | N/A | | |

| | | | |
|---|---|---|---|
| Maximum Continuous Rating at **Registered Capacity** or **Maximum Capacity** | MVA | | |
| Primary reactance Xin or Xts (see Table PC.A.5.8.1) | pu on MVA | | |
| Additional reactance $X_{tr}$ (See Table PC.A.5.8.1) | pu on MVA | | |
| **Maximum Capacity** | MW | | |
| **Active ROCOF Response Power** (MW) injected or absorbed at 1Hz/s **System Frequency** change (which is the maximum frequency change for linear operation of the **Grid Forming Plant**) | MW | | |
| **Phase Jump Angle Withstand** | degrees | | 60 degrees specified |
| **Phase Jump Angle limit** | degrees | | 5 degrees recommended |
| **Phase Jump Power** (MW) at the rated angle | MW | | |
| **Defined Active Damping Power** for a **Grid Oscillation Value** of 0.05 Hz peak to peak at 1 Hz | MW | | |
| The cumulative energy delivered for a 1Hz/s **System Frequency** fall from 52 Hz to 47 Hz. This is the total **Active Power** transient output of the **Grid Forming Plant** | MWs or MJ | | |
| **Inertia Constant** (**H**) using equation 1 or declared in accordance with the simulation results of ECP.A.3.9.4 | MWs/MVA | | |
| **Inertia Constant** (**He**) using equation 2 or declared in accordance with the simulation results of ECP.A.3.9.4 | MWs/MVA | | |
| Continuous Overload Capability | % on MVA | | |
| Short Term duration Overload capability | | | |
| Duration of Short Term Overload Capability | s | | |
| **Peak Current Rating** | Pu | | |

| | | | |
|---|---|---|---|
| Nominal **Grid Entry Point** or **User System Entry Point** voltage | kV | | |
| **Grid Entry Point** or **User System Entry Point** | - Location | | |
| Continuous or defined time duration MVA Rating | MVA | | |
| Continuous or defined time duration MW Rating | MW | | |
| For a **GBGF-I** the inverters maximum **Internal Voltage Source** (**IVS**) for the worst case condition – for example operation at maximum exporting **Reactive Power** at the maximum AC **System** voltage | pu | | |
| Maximum Three Phase Short Circuit Infeed at **Grid Entry Point** or **User System Entry Point** | kA | | |
| Maximum Single Phase Short Circuit Infeed at **Grid Entry Point** or **User System Entry Point** | kA | | |
| Will the **Grid Forming Plant** contribute to any other form of commercial service – for example Dynamic Containment, Firm Frequency Response, | Details to be provided | | |
| **Equivalent Damping Factor.** | Z | | 0.2 to 5.0 allowed |

Table PC.A.5.8.2

H = Installed MWs / Rated installed MVA

(equation 1)

He = (**Active ROCOF Response Power** at 1 Hz / s x **System Frequency**) / ( Installed MVA x 2 )

(equation 2)

PC.A.6 USERS' SYSTEM DATA

PC.A.6.1 Introduction

PC.A.6.1.1 Each **User**, whether connected directly via an existing **Connection Point** to the **National Electricity Transmission System** or seeking such a direct connection, or providing terms for connection of an **Offshore Transmission System** to its **User System** to **The Company** or undertaking **OTSDUW**, shall provide **The Company** with data on its **User System** or **OTSDUW Plant and Apparatus** which relates to the **Connection Site** containing the **Connection Point** (or **Interface Points** or **Connection Points** in the case of **OTSUA**) both current and forecast, as specified in PC.A.6.2 to PC.A.6.6.

PC.A.6.1.2 Each **User** must reflect the system effect at the **Connection Site(s)** of any third party **Embedded** within its **User System** whether existing or proposed.

PC.A.6.1.3 PC.A.6.2, and PC.A.6.4 to PC.A.6.7 consist of data which is only to be supplied to **The Company** at **The Company's** reasonable request. In the event that **The Company** identifies a reason for requiring this data, **The Company** shall write to the relevant **User**(s), requesting the data, and explaining the reasons for the request. If the **User**(s) wishes, **The Company** shall also arrange a meeting at which the request for data can be discussed, with the objective of identifying the best way in which **The Company's** requirements can be met. In respect of **EU Code User**(s) only, **The Company** may request the need for electromagnetic transient simulations at **The Company's** reasonable request. **Users** with **EU Grid Supply Points** may be required to provide electromagnetic transient simulations in relation to those **EU Grid Supply Points** at **The Company**'s reasonable request.

Where **The Company** makes a request to a **User** for dynamic models under PC.A.6.7, each relevant **User** shall ensure that the models supplied in respect of their **Plant** and **Apparatus** reflect the true and accurate behaviour of the **Plant** and **Apparatus** as built and verified through the **Compliance Processes** (**CP**'s) or **European Compliance Processes** (**ECP**).

PC.A.6.2 Transient Overvoltage Assessment Data

PC.A.6.2.1 It is occasionally necessary for **The Company** to undertake transient overvoltage assessments (e.g. capacitor switching transients, switchgear transient recovery voltages, etc). At **The Company's** reasonable request, each **User** is required to provide the following data with respect to the **Connection Site** (and in the case of **OTSUA**, **Interface Points** and **Connection Points**), current and forecast, together with a **Single Line Diagram** where not already supplied under PC.A.2.2.1, as follows:

(a) busbar layout plan(s), including dimensions and geometry showing positioning of any current and voltage transformers, through bushings, support insulators, disconnectors, circuit breakers, surge arresters, etc. Electrical parameters of any associated current and voltage transformers, stray capacitances of wall bushings and support insulators, and grading capacitances of circuit breakers;

(b) Electrical parameters and physical construction details of lines and cables connected at that busbar. Electrical parameters of all plant e.g., transformers (including neutral earthing impedance or zig-zag transformers, if any), series reactors and shunt compensation equipment connected at that busbar (or to the tertiary of a transformer) or by lines or cables to that busbar;

(c) Basic insulation levels (BIL) of all **Apparatus** connected directly, by lines or by cables to the busbar;

(d) characteristics of overvoltage **Protection** devices at the busbar and at the termination points of all lines, and all cables connected to the busbar;

(e) fault levels at the lower voltage terminals of each transformer connected directly or indirectly to the **National Electricity Transmission System** (including **OTSUA** at each **Interface Point** and **Connection Point**) without intermediate transformation;

(f) the following data is required on all transformers operating at **Supergrid Voltage** throughout **Great Britain** and, in Scotland and **Offshore**, also at 132kV or greater (including **OTSUA**): three or five limb cores or single phase units to be specified, and operating peak flux density at nominal voltage;

(g) an indication of which items of equipment may be out of service simultaneously during **Planned Outage** conditions.

PC.A.6.3 User's Protection Data

PC.A.6.3.1 Protection

The following information is required which relates only to **Protection** equipment which can trip or inter-trip or close any **Connection Point** circuit-breaker or any **Transmission** circuit-breaker (or in the case of **OTSUA**, any **Interface Point** or **Connection Point** circuit breaker). This information need only be supplied once, in accordance with the timing requirements set out in PC.A.1.4(b), and need not be supplied on a routine annual basis thereafter, although **The Company** should be notified if any of the information changes;

(a) a full description, including estimated settings, for all relays and **Protection** systems installed or to be installed on the **User's System**;

(b) a full description of any auto-reclose facilities installed or to be installed on the **User's System**, including type and time delays;

(c) a full description, including estimated settings, for all relays and **Protection** systems or to be installed on the generator, generator transformer, **Station Transformer** and their associated connections;

(d) for **Generating Units** (including **Synchronous Generating Units** forming part of a **Synchronous Power Generating Module** but excluding **Power Park Units**) or **Power Park Modules** (including **DC Connected Power Park Modules**) or **HVDC Systems** or **DC Converters** at a **DC Converter Station** or **OTSDUW Plant and Apparatus** having (or intended to have) a circuit breaker at the generator terminal voltage, clearance times for electrical faults within the **Generating Unit** (including **Synchronous Generating Units** forming part of a **Synchronous Power Generating Module** but excluding a **Power Park Unit**) or **Power Park Module** (including **DC Connected Power Park Modules**) zone, or within the **OTSDUW Plant and Apparatus**;

(e) the most probable fault clearance time for electrical faults on any part of the **User's System** directly connected to the **National Electricity Transmission System** including **OTSDUW Plant and Apparatus**; and

(f) in the case of **OTSDUW Plant and Apparatus**, synchronisation facilities and delayed auto reclose sequence schedules (where applicable).

(g) **Restoration Contractors** and **Network Operators** shall provide the above **Protection** data where different settings are used in respect of their **Plant** and **Apparatus** which are associated with a **Restoration Plan**.

PC.A.6.4 Harmonic Studies

PC.A.6.4.1 It is occasionally necessary for **The Company** to evaluate the production/magnification of harmonic distortion on the **National Electricity Transmission System** and **User's Systems** (and **OTSUA**), especially when **The Company** is connecting equipment such as capacitor banks. At **The Company's** reasonable request, each **User** is required to submit data with respect to the **Connection Site** (and in the case of **OTSUA**, each **Interface Point** and **Connection Point**), current and forecast, and where not already supplied under PC.A.2.2.4 and PC.A.2.2.5, as follows:

PC.A.6.4.2 Overhead lines and underground cable circuits of the **User's Subtransmission System** must be differentiated and the following data provided separately for each type:

Positive phase sequence resistance;

Positive phase sequence reactance;

Positive phase sequence susceptance;

and for all transformers connecting the **User's Subtransmission System** and **OTSDUW Plant and Apparatus** to a lower voltage:

Rated MVA;

Voltage Ratio;

Positive phase sequence resistance;

Positive phase sequence reactance;

and at the lower voltage points of those connecting transformers:

Equivalent positive phase sequence susceptance;

Connection voltage and MVAr rating of any capacitor bank and component design parameters if configured as a filter;

Equivalent positive phase sequence interconnection impedance with other lower voltage points;

The minimum and maximum **Demand** (both MW and MVAr) that could occur;

Harmonic current injection sources in Amps at the Connection voltage points. Where the harmonic injection current comes from a diverse group of sources, the equivalent contribution may be established from appropriate measurements;

Details of traction loads, eg connection phase pairs, continuous variation with time, etc;

An indication of which items of equipment may be out of service simultaneously during **Planned Outage** conditions.

PC.A.6.5 Voltage Assessment Studies

It is occasionally necessary for **The Company** to undertake detailed voltage assessment studies (e.g., to examine potential voltage instability, voltage control co-ordination or to calculate voltage step changes). At **The Company's** reasonable request, each **User** is required to submit the following data where not already supplied under PC.A.2.2.4 and PC.A.2.2.5:

For all circuits of the User's Subtransmission System (and any OTSUA):-

Positive Phase Sequence Reactance;

Positive Phase Sequence Resistance;

Positive Phase Sequence Susceptance;

MVAr rating of any reactive compensation equipment;

and for all transformers connecting the **User's Subtransmission System** to a lower voltage (and any **OTSUA**):

Rated MVA;

Voltage Ratio;

Positive phase sequence resistance;

Positive Phase sequence reactance;

Tap-changer range;

Number of tap steps;

Tap-changer type: on-load or off-circuit;

AVC/tap-changer time delay to first tap movement;

AVC/tap-changer inter-tap time delay;

and at the lower voltage points of those connecting transformers (and any **OTSUA**):-

Equivalent positive phase sequence susceptance;

MVAr rating of any reactive compensation equipment;

Equivalent positive phase sequence interconnection impedance with other lower voltage points;

The maximum **Demand** (both MW and MVAr) that could occur;

Estimate of voltage insensitive (constant power) load content in % of total load at both winter peak and 75% off-peak load conditions.

PC.A.6.6 Short Circuit Analysis

PC.A.6.6.1 Where prospective short-circuit currents on **Transmission** equipment are greater than 90% of the equipment rating, and in **The Company's** reasonable opinion more accurate calculations of short-circuit currents are required, then at **The Company's** request each **User** is required to submit data with respect to the **Connection Site** (and in the case of **OTSUA**, each **Interface Point** and **Connection Point**), current and forecast, and where not already supplied under PC.A.2.2.4 and PC.A.2.2.5, as follows:

PC.A.6.6.2 For all circuits of the **User's Subtransmission System** (and any **OTSUA**):

Positive phase sequence resistance;

Positive phase sequence reactance;

Positive phase sequence susceptance;

Zero phase sequence resistance (both self and mutuals);

Zero phase sequence reactance (both self and mutuals);

Zero phase sequence susceptance (both self and mutuals);

and for all transformers connecting the **User's Subtransmission System** to a lower voltage (and any **OTSUA**):

Rated MVA;

Voltage Ratio;

Positive phase sequence resistance (at max, min and nominal tap);

Positive Phase sequence reactance (at max, min and nominal tap);

Zero phase sequence reactance (at nominal tap);

Tap changer range;

Earthing method: direct, resistance or reactance;

Impedance if not directly earthed;

and at the lower voltage points of those connecting transformers (and any **OTSUA**):

The maximum **Demand** (in MW and MVAr) that could occur;

Short-circuit infeed data in accordance with PC.A.2.5.6 unless the **User**'s lower voltage network runs in parallel with the **User**'s **Subtransmission System**, when to prevent double counting in each node infeed data, a $\pi$ equivalent comprising the data items of PC.A.2.5.6 for each node together with the positive phase sequence interconnection impedance between the nodes shall be submitted.

PC.A.6.7 Dynamic Models

PC.A.6.7.1 It is occasionally necessary for **The Company** to evaluate the dynamic performance of **User's Plant** and **Apparatus** at each **EU Grid Supply Point** or in the case of **EU Code Users**, their **System**. At **The Company's** reasonable request and as agreed between **The Company** and the relevant **Network Operator** or **Non-Embedded Customer**, each **User** is required to provide the following data. Where such data is required, **The Company** will work with the **Network Operator** or **Non-Embedded Customer** to establish the scope of the dynamic modelling work and share the required information where it is available:-

(a) Dynamic model structure and block diagrams including parameters, transfer functions and individual elements (as applicable);

(b) Power control functions and block diagrams including parameters, transfer functions and individual elements (as applicable);

(c) Voltage control functions and block diagrams including parameters, transfer functions and individual elements (as applicable);

(d) Converter control models and block diagrams including parameters, transfer functions and individual elements (as applicable).

PC.A.7 ADDITIONAL DATA FOR NEW TYPES OF POWER STATIONS, DC CONVERTER STATIONS, OTSUA AND CONFIGURATIONS

Notwithstanding the **Standard Planning Data** and **Detailed Planning Data** set out in this Appendix, as new types of configurations and operating arrangements of **Power Stations**, **HVDC Systems**, **DC Converter Stations** and **OTSUA** emerge in future, **The Company** may reasonably require additional data to represent correctly the performance of such **Plant** and **Apparatus** on the **System**, where the present data submissions would prove insufficient for the purpose of producing meaningful **System** studies for the relevant parties.

## PART 3 - DETAILED PLANNING DATA

PC.A.8 To allow a **User** to model the **National Electricity Transmission System**, **The Company** will provide, upon request, the following **Network Data** to **Users**, calculated in accordance with **Good Industry Practice**:

To allow a **User** to assess undertaking **OTSDUW** and except where provided for in Appendix F, **The Company** will provide upon request the following **Network Data** to **Users**, calculated in accordance with **Good Industry Practice**:

PC.A.8.1 Single Point of Connection

For a **Single Point of Connection** to a **User's System** (and **OTSUA**), as a Transmission System voltage source, the data (as at the HV side of the **Point of Connection** (and in the case of **OTSUA**, each **Interface Point** and **Connection Point**) reflecting data given to **The Company** by **Users**) will be given to a **User** as follows:

The data items listed under the following parts of PC.A.8.3:

(a) (i), (ii), (iii), (iv), (v) and (vi) and the data items shall be provided in accordance with the detailed provisions of PC.A.8.3 (b) - (e).

PC.A.8.2 Multiple Point of Connection

For a **Multiple Point of Connection** to a **User's System** equivalents suitable for use in loadflow and fault level analysis shall be provided. These equivalents will normally be in the form of a π model or extension with a source (or demand for a loadflow equivalent) at each node and a linking impedance. The boundary nodes for the equivalent shall be either at the **Connection Point** (and in the case of **OTSDUW**, each **Interface Point** and **Connection Point**) or (where **The Company** agrees) at suitable nodes (the nodes to be agreed with the **User**) within the **National Electricity Transmission System**. The data at the **Connection Point** (and in the case of **OTSDUW**, each **Interface Point** and **Connection Point**) will be given to a **User** as follows:

The data items listed under the following parts of PC.A.8.3:-

(a) (i), (ii), (iv), (v), (vi), (vii), (viii), (ix), (x) and (xi)

and the data items shall be provided in accordance with the detailed provisions of PC.A.8.3 (b) - (e).

When an equivalent of this form is not required **The Company** will not provide the data items listed under the following parts of PC.A.8.3:-

(a) (vii), (viii), (ix), (x) and (xi)

PC.A.8.3 Data Items

(a) The following is a list of data utilised in this part of the **PC**. It also contains rules on the data which generally apply.

(i) symmetrical three-phase short circuit current infeed at the instant of fault from the **National Electricity Transmission System**, ($I_1$");

(ii) symmetrical three-phase short circuit current from the **National Electricity Transmission System** after the subtransient fault current contribution has substantially decayed, ($I_1$');

(iii) the zero sequence source resistance and reactance values at the **Point of Connection** (and in case of **OTSUA**, each **Interface Point** and **Connection Point**), consistent with the maximum infeed below;

(iv) the pre-fault voltage magnitude at which the maximum fault currents were calculated;

(v) the positive sequence X/R ratio at the instant of fault;

(vi) the negative sequence resistance and reactance values of the **National Electricity Transmission System** seen from the **Point of Connection** (and in case of **OTSUA**,

each **Interface Point** and **Connection Point**), if substantially different from the values of positive sequence resistance and reactance which would be derived from the data provided above;

(vii) the initial positive sequence resistance and reactance values of the two (or more) sources and the linking impedance(s) derived from a fault study constituting the (π) equivalent and evaluated without the **User** network and load and where appropriate without elements of the **National Electricity Transmission System** between the **User** network and agreed boundary nodes (and in case of **OTSUA**, each **Interface Point** and **Connection Point**);

(viii) the positive sequence resistance and reactance values of the two (or more) sources and the linking impendence(s) derived from a fault study, considering the short circuit current contributions after the subtransient fault current contribution has substantially decayed, constituting the (π) equivalent and evaluated without the **User** network and load, and where appropriate without elements of the **National Electricity Transmission System** between the **User** network and agreed boundary nodes (and in case of **OTSUA**, each **Interface Point** and **Connection Point**);

(ix) the corresponding zero sequence impedance values of the (π) equivalent produced for use in fault level analysis;

(x) the **Demand** and voltage at the boundary nodes and the positive sequence resistance and reactance values of the linking impedance(s) derived from a loadflow study considering **National Electricity Transmission System** peak **Demand** constituting the (π) loadflow equivalent; and,

(xi) where the agreed boundary nodes are not at a **Connection Point** (and in case of **OTSUA**, **Interface Point** or **Connection Point**), the positive sequence and zero sequence impedances of all elements of the **National Electricity Transmission System** between the **User** network and agreed boundary nodes that are not included in the equivalent (and in case of **OTSUA**, each **Interface Point** and **Connection Point**).

(b) To enable the model to be constructed, **The Company** will provide data based on the following conditions.

(c) The initial symmetrical three phase short circuit current and the transient period three phase short circuit current will normally be derived from the fixed impedance studies. The latter value should be taken as applying at times of 120ms and longer. Shorter values may be interpolated using a value for the subtransient time constant of 40ms. These fault currents will be obtained from a full **System** study based on load flow analysis that takes into account any existing flow across the point of connection being considered.

(d) **The Company** will provide the appropriate supergrid transformer data for the **National Electricity Transmission System** associated with equivalent voltage source data.

(e) The positive sequence X/R ratio and the zero sequence impedance value will correspond to **The Company's** source network only, that is with the section of network if any with which the equivalent is to be used excluded. These impedance values will be derived from the condition when all **Generating Units** (including **Synchronous Generating Units** forming part of a **Synchronous Power Generating Module**) are **Synchronised** to the **National Electricity Transmission System** or a **User's System** and will take account of active sources only including any contribution from the load to the fault current. The passive component of the load itself or other system shunt impedances should not be included.

(f) A **User** may at any time, in writing, specifically request for an equivalent to be prepared for an alternative **System** condition, for example where the **User's System** peak does not correspond to the **National Electricity Transmission System** peak, and **The Company** will, insofar as such request is reasonable, provide the information as soon as reasonably practicable following the request.

PC.A.9 **CONTROL SYSTEM MODEL REQUIREMENTS FOR USERS**

PC.A.9.1 OBJECTIVE

PC.A.9.1.1 Control and protection system models, along with other **Plant** and **Apparatus** information are required by this **PC**, with supporting documentation provided to **The Company** in order for **The Company** and **Transmission Licensees** to assess the impact of the **User's Plant and Apparatus** on the transient performance, security and stability of the **Transmission System**.

PC.A.9.1.2 The control and protection system models submitted by the **User** shall be representative of the **User's Plant and Apparatus** at the **Connection** Point appropriate to the type of model eg. RMS or EMT. All control and protection system models must take into account all communication, controller and processing delays relevant to modelling the performance of the **User's Plant and Apparatus**. If all **Power Park Units** or **DC Convertors** or **HVDC Converters** contained within the **Users Plant and Apparatus** are not identical, the control system model shall account for this by accurately representing the overall performance of the **Users Plant and Apparatus** at the **Connection Point**.

PC.A.9.1.3 The control and protection system models shall include representation of all relevant functionality required by the Grid Code including services provided to **The Company**. For example, this includes voltage control, LFSM-O, LFSM-U, frequency response, fault ride through, fast fault current injection, protection and automatic switching of shunt devices. Where modes of operation are selectable, the ability to select the mode of operation shall be included within the control system model. Additional guidance on relevant functionality will be published on **The Company** website.

PC.A.9.2. SCOPE

PC.A.9.2.1 All **Users** shall provide root mean-square (RMS) models which represent the **Users Plant and Apparatus** and controllers in balanced, RMS, positive phase-sequence, time domain studies.

PC.A.9.2.2 All **Generators**, **HVDC Convertor Station Owners**, or **HVDC System Owners** directly connected to the **Transmission System** or **Generators** with **Large Power Stations** and **HVDC Convertor Station** Owners or **HVDC System Owners** with **DC Converter Stations** or **HVDC Systems** embedded within a **User** system which employ convertors/invertors to import or export power to or from the **System** shall provide Electro-Magnetic Transient (EMT) models which represent the **Users Plant and Apparatus** in electromagnetic transient studies on the transmission and distribution system. For the avoidance of doubt this includes **Generators** who own and operate a **Power Park Module** comprising doubly fed induction generators and may include the excitation and governor control systems associated with **Synchronous Generating Units** if these impact on the types of study described on **The Company** website.

PC.A.9.2.3 **The Company** may specify requirements for other models in the **Bilateral Agreement** if required for specific connections in accordance with good industry practice. For example Real Time Dynamic Simulator (RTDS) Models may be required for protection co-ordination.

PC.A.9.3 Balanced Root Mean Squared (RMS) Control System Model

PC.A.9.3.1 The balanced, root mean-square positive sequence time-domain models shall be able to calculate how aspects, (including but not limited to; **Active Power** and **Reactive Power)** of the **User's Plant and Apparatus** vary due to changes in **System Frequency** and voltage at the **Connection Point**.

PC.A.9.3.2 The RMS models shall include all electrical and mechanical phenomena that impact on the **Active Power** and/or **Reactive Power** of the **User's Plant and Apparatus** for sub-transient, transient and synchronous dynamics within the context of an RMS study assumptions up to and including **Primary** and **Secondary Response** timeframes or when post-event steady state conditions have been achieved.

PC.A.9.3.3 The **User** shall provide RMS models in the software package specified in PC.A.9.8.1.

PC.A.9.3.4 The RMS models maybe either a User specific model or a standard open-source models, such as a standard WECC, IEEE or IEC control system model available in the software format as specified by **The Company** provided this model represents the **User's Plant and Apparatus** at the **Connection Point**. Where the **User** is referencing a standard model, the **User** will submit an unambiguous reference to the model and a full set of parameters for the control system model representing the control system performance of the real **Plant and Apparatus**.

PC.A.9.3.4.1 Where a **User** specific model is provided sufficient information shall be provided by the **User** to allow for **The Company** to redevelop RMS models in the event of future software environment changes or version updates. All models shall be accompanied with appropriate documentation with sufficient detail as specified and deemed complete by **The Company** (such agreement not to be unreasonably withheld).

PC.A.9.3.4.2 Where a **User** specific model is provided the **User** shall provide information:

(i) a full description of the models structure, functionality and the **User's Plant and Apparatus** represented.

(ii) inputs/outputs and functionality,

(iii) the information described in PC.A.5 relevant to the technology modelled.

PC.A.9.3.5 **The Company** may, when necessary, require the **User** to provide details of the proper operation of its complete RMS system representation or to facilitate its understanding of the results of a RMS dynamic simulation or request additional information concerning the RMS control system model. This should take place no later than the issuance of the FON.

PC.A.9.3.5 The performance requirements for the RMS models are included in Appendix PC.A.9.8

PC.A.9.4 **Electromagnetic Transient (EMT) Model**

PC.A.9.4.1 The three-phase electromagnetic transient control and supporting informtion shall include all material aspects of the **User's Plant and Apparatus** that affect the voltage and current outputs, including those of the control and protection response from the **User's Plant and Apparatus**. The models shall represent phenomena that materially affect the voltage and **Frequency** on the **Total System** over timeframes of sub-cycle up to 50 cycles including, but not limited to, switching electronic devices, transformer saturation and equipment energisation.

PC.A.9.4.2 The **User** shall provide EMT models in the software package specified in PC.A.9.9.1.

PC.A.9.4.3 The performance requirements for the EMT control system model are included in Appendix PC.A.9.9

PC.A.9.5 Replica Control Systems, RTDS, RSCAd

PC.A.9.5.1 Where required by the Bilateral Agreement, the **User** shall provide replica and/or suitable Real Time Dynamic Simulator models. The details of any such rmodels will be included in the Bilateral Agreement.

PC.A.9.6 CONFIDENTIALITY AND SHARING

PC.A.9.6.1 CONFIDENTIALITY AND SHARING RMS TYPE MODELS

PC.A.9.6.1.1 The models, supporting documentation and associated data are provided to **The Company** in order to carry out its duties to meet its **ESO Licence** and Grid Code obligations. In that regard, **the Company** is entitled to share the models, supporting documentation and associated data with the **Transmission Licensees**. **The Company** and/or **Transmission Licensees** may share the models with companies/contractors employed by **the Company** or **Transmission Licensees** to carry out licensed activities. Where such data is shared with third parties working with **The Company** or **Transmission Licensees**, this data will be shared as provided in GC.12.

PC.A.9.6.1.2 It is the responsibility of the **User** to provide the RMS models, supporting documentation and associated data to **The Company**. **The Company** will accept the models, supporting documentation and associated data from a manufacturer as a **Manufacturers Data and Performance Report** (See ECP.10). **The Company** will only accept this information from a third party manufacturer provided the third party manufacturer agrees to enter into **The Company's** standard confidentiality agreement for **User**s for sharing of the model as outlined in PC.A.9.6.1. In the event the third party manufacturer is unable to enter into **The Company's** standard confidentiality agreement, the **User** shall be responsible for the provision of the RMS models, supporting documentation and associated data to **The Company**.

PC.A.9.6.1.3 It may also be necessary for **The Company** to share a representative RMS model with another **User** to comply with applicable Grid Code requirements (e.g. ECC.6.3.17.1.5 and ECC.6.3.17.2.3) and Bilateral Agreement. For these purposes the **User** must recorded in the **Compliance Statements** either:

(i) A declaration that the models submitted for compliance purposes may be shared; or,

(ii) provide an equivalent encrypted version of the model that may be shared. In this event the **User** shall demonstrate that the performance of the models and the encrypted model are comparable.

PC.A.9.6.1.4 The **User** shall notify **The Company** of any changes to RMS models in accordance with PC.A.1.2. Unless specified otherwise in the **Bilateral Agreement**, RMS models must be submitted:

(i) at least 3 months prior to date requested for issue of the **Interim Operational Notification**

(ii) at least 1 month prior to date of issue of a **Limited Operational Notification**

for the **Users Plant and Apparatus**.

PC.A.9.6.2 CONFIDENTIALITY AND SHARING EMT TYPE MODELS

PC.A.9.6.2.1 The EMT model, supporting documentation and associated data are provided to **The Company** in order to carry out its duties to meet its **ESO Licence** and Grid Code obligations. In that regard, **the Company** is entitled to share the EMT models, supporting documentation and associated data with the **Transmission Licensees**. **The Company** and/or **Transmission Licensees** may share the EMT model with companies/contractors employed by **the Company** or **Transmission Licensees** to carry out licensed activities. Where such data is shared with third parties working with **The Company** or **Transmission Licensees**, this data will be shared and protected as provided in GC.12.

PC.A.9.6.2.2 It is the responsibility of the **User** to provide the EMT models, supporting documentation and associated data to **The Company**. **The Company** will accept the EMT models, supporting documentation and associated data from a manufacturer as a **Manufacturers Data and Performance Report** (See ECP.10). **The Company** will only accept this information from a third party manufacturer provided the third party manufacturer agrees to enter into **The Company's** standard confidentiality agreement for **User**s for sharing of the model as outlined in PC.A.9.6.2. In the event the third party manufacturer is unable to enter into **The Company's** standard confidentiality agreement, the **User** shall be responsible for the provision of the EMT models, supporting documentation and associated data to **The Company**.

PC.A.9.6.2.3 It may be necessary for **The Company** to share a representative EMT model with another **User** to comply with applicable Grid Code requirements (e.g. ECC.6.3.17.1.5 and ECC.6.3.17.2.3) and Bilateral Agreement. For these purposes the **User** must record in the **Compliance Statements** either:

(i) a declaration that the EMT model submitted for compliance purposes (PC.A.9.6.2.1) may be shared with another **User** for the purpose of fulfilling relevant Grid Code requirements; or,

(ii) provide an equivalent EMT model that maybe shared with another **User** for the purpose of fulfilling relevant Grid Code requirements. In this event the **User** shall declare that the performance of the equivilent EMT model is adequate for the purposes of fulfilling relevant Grid Requirements as published on **The Company** website.

PC.A.9.6.2.4 Where it is necessary for **The Company** to share a representative EMT model with another **User**, the **User** in receipt of the model shall:

(i) limit of the use of the EMT model to a specific purpose agreed with **The Company** (e.g. simulation requirements to demonstrate compliance with Grid Code including ECC.6.3.17.1 and ECC.6.3.17.2 and Bilateral Agreement)

(ii) control access to the EMT model to only those individuals who are strictly necessary for the execution of the specific purpose.

(iii) establish and maintain security measures to restrict access to and prevent distribution of the EMT model (e.g. single computer terminal containing the EMT model and restricting access to file areas where the model resides)

(iv) ensure any publication is only for demonstrating compliance with the specific purpose agreed with **The Company** and shall not include any data directly derived from the EMT model

(v) not disclose the EMT model

(vi) destroy all copies of the EMT model and supporting material in a confidentially secure manner after the execution of the specific purpose is complete. Destruction of the EMT model and supporting material shall be confirmed to **The Company** in writing.

PC.A.9.6.2.5 The **User** shall notify **The Company** of any changes to EMT models in accordance with PC.A.1.2. Unless specified otherwise in the **Bilateral Agreement**, EMT models must be submitted:

(i) at least 3 months prior to date requested for issue of the **Interim Operational Notification**

(ii) at least 1 month prior to date of issue of a **Limited Operational Notification**

for the **Users Plant and Apparatus**.

PC.A.9.7 VALIDATION

PC.A.9.7.1 The **User** shall submit evidence that the models have been validated demonstrating that the models under simulation conditions is representative of the **User's Plant and Apparatus** under equivalent conditions. Validation of models before commissioning may be against test results at other comparable sites, Factory Acceptance Tests of comparable equipment, or type test results to show that the responses shown by the models are representative of the **Users Plant and Apparatus**. Results from model validation in accordance internationaly recommended standards (for example IEC) where applicable are also acceptable.

PC.A.9.7.2 A User may request agreement from **The Company** on the process for validating the models. In particular, for **Users Plant and Apparatus** where Factory Acceptance Testing is to be carried out details of any additional model validation at this stage should be agreed in a timely manner prior to the testing being carried out. Tests should generally include steady state **Reactive Power** capability, voltage control, **Fault Ride Through** and **Frequency** response.

PC.A.9.7.3 After final compliance testing as required under the **CP** or **ECP**, the **User** shall carry out validation of the model simulation results against measurements from final compliance testing in accordance with CP.A.3 or ECP.A.3, to ensure the model responses are representative of the **Users Plant and Apparatus.**

PC.A.9.7.4 If these tests show the models are not representative of the **User's Plant and Apparatus**, the **User** shall provide updated models, supporting documentation and associated data to ensure the responses shown by the model is representative of the responses shown by **User's Plant and Apparatus** during testing.

PC.A.9.7.5 In the event **The Company** identifies through lifetime monitoring (OC5) that that the response of the models are not representative of the **User's Plant and Apparatus**, **The Company** shall notify the **User**. The **User** shall provide the revised models, supporting documentation and associated data whose response is representative of the **Users Plant and Apparatus** as soon as reasonably practicable, but in any case no longer than 54 days after notification by **The Company**. In the event of revised models not being made available a **Limited Operational Notification** (as detailed in CP.9 or ECP.9 as applicable) may be issued with appropriate restrictions.

PC.A.9.7.6 The **User** is responsible for ensuring the models remain representative of the **User's Plant and Apparatus** throughout the operational lifetime of the **User's Plant and Apparatus**. In the event of the **User** modifying hardware/software which affects the control and/or operation of the **Users Plant and Apparatus**, the **User** shall provide **The Company** with updated models, supporting documentation and associated data to enable **The Company** to assess the impact of the modification of the **Users Plant and Apparatus** on the **Total System**. Such changes may require other compliance activity as described in the **CP** or **ECP** as applicable.

PC.A.9.7.7 The **User** shall demonstrate that the representation of a **User's Plant and Apparatus** and models perform correctly in a sample network model published by **The Company** before being accepted. The **User** should represent the **User's Plant and Apparatus** modelled in accordance with the **Single Line Diagram** and parameters submitted under the **Planning Code** and **DRC** in Schedules 1, 5 or 18 aggregating multiple **Power Park Units** and the collector grid to a single **Power Park Unit** representing a **Power Park Module**.

PC.A.9.8 RMS MODEL PERFORMANCE SPECIFICATION

PC.A.9.8.1 The RMS models shall be provided in the format required by **The Company**. **The Company** shall publish on **The Company** website acceptable software versions. **The Company** will act reasonable in determining acceptable software versions or compatible formats. In accordance with good industry practice **The Company** will consult with the industry prior to changing the format required. Prior to the start of model development the **User** may request formal agreement from **The Company** of the software version.The RMS models shall be compatible with Objectives as outlined in Grid Code PC.A.9.1 Additional guidance on RMS model is published on **The Company** website.

PC.A.9.8.2 GENERAL

PC.A.9.8.2.1 User RMS models shall interface with the software in a manner that is consistent with the behaviour of standard library models.

PC.A.9.8.2.1 The models shall use standard library functional blocks representing using standard Laplace block diagram format to the extent practicable.. Where user defined functional blocks have been submitted the **User** must provide **The Company** with the relevant documentation for the model including transfer block diagrams and an explanation of any coding to the satisfaction of **The Company**.

PC.A.9.8.2.2 The use of any "black boxes" encrypted code or external DLLs is not acceptable. An additional RMS model with these features maybe provided for comparison but for the avoidance of doubt does not meet the requirements of PC.A.9.

PC.A.9.8.2.3 The **User** shall specify the operating ranges for the model and shall be consistent with the real physical values and the actual performance of the **Plant and Apparatus**. This may include **Reactive Power** limits and allowable voltage ranges with control mode and **Droop** settings configured according to the usual operation. This information shall be provided either on the appropriate per unit base or in physical units.

PC.A.9.8.2.4 The RMS model must compile without errors. Warnings must be kept to a minimum.

PC.A.9.8.3 INITIALISATION

PC.A.9.8.3.1 The RMS model shall be self contained. The combined load-flow and dynamic model shall solve with minimal warnings without the need for manual adjustment or to run external software routines that adjust parameters in either the load-flow case or the dynamic case or both. External software or automation routines to integrate the model are not acceptable.

PC.A.9.8.3.2 The RMS model shall automatically initialise its parameters from load flow simulations without errors and with minimal warnings , must not result in run time errors and run with minimal warnings , and there must not be any interactions or conflicts with other models. The RMS models initialisation shall be invariant to simulation start time (i.e. not require the simulation to be initialised at a particular time). External software or automation routines to initialise the model are not acceptable.

PC.A.9.8.3.3 The RMS model is expected to be numerically stable and must adequately represent the expected equipment behaviour over the operational range of the **Plant and Apparatus** at the **Connection Point**. This includes the full load and **Reactive Power** range of the **Plant and Apparatus**, the range of system voltage and **frequency** operating range (described in Grid Code CC.6.1/ECC.6.1), short circuit levels and X/R ratio at the **Connection Point** where it would be in operation. These values maybe requested from **The Company or** the **Distribution Network Owner** during the compliance process. If necessary, the **User** shall provide a supplementary model for specific conditions. All information on the model capabilities shall be addressed in the model documentation provided to **The Company**.

PC.A.9.8.4 OUTPUT MESSAGES

PC.A.9.8.4.1 It is not acceptable for the models to crash catastrophically and provide no documentary evidence as to why the simulation failed.

PC.A.9.8.4.2 RMS models shall allow all appropriate internal variables to be requested for output for the duration of the simulation.

PC.A.9.8.4.3 In the case where the **User's Plant** trips during simulation, the relevant RMS models shall set the flag that indicates that the **User's Plant** has tripped.

PC.A.9.8.4.4 For protection events (e.g. crow bar controller operation) the simulation events, including initial detection, operation, and time-out, should be reported to the PowerFactory output window during the simulation.

PC.A.9.8.5 Integration Time Step

PC.A.9.8.5.1 The dynamic model must support time domain simulations with a minimum integration step size of 0.01 s.

PC.A.9.8.5.2 The models must not include algorithms that require use of a particular integration step size (for example the control system model should not fail to solve, or the response be materially different for an integration step size of 0.005 s).

PC.A.9.8.5.3 Time constants below 0.01 s should only be included if their inclusion is critical to the performance of the dynamic model and should be agreed with **The Company**. In this case, an alternative model may be requested according to PC.A.9.8.3.3, if required.

PC.A.9.8.5.4 Internal integration algorithms should only be included if their inclusion is critical to meeting the accuracy requirements, and should not materially detract from model simulation speed performance.

PC.A.9.9 EMT MODEL PERFORMANCE SPECIFICATION

PC.A.9.9.1 The **User** shall provide EMT models in the format required by **The Company**. **The Company** shall maintain a list of acceptable software versions, and compiler version which shall be published on **The Company** website. **The Company** will act reasonable in determining acceptable software versions or compatible formats. In accordance with good industry practice **The Company** will consult with the industry prior to changing the format required. The EMT models shall be compatible with Objectives as outlined in Grid Code PC.A.9.1 and **The Company** shall also publish on **The Company** website a description of the types of study that **The Company** and **Transmission Licensees** will use the EMT control system models in. Additional guidance on EMT model is also published on **The Company** website.

PC.A.9.9.2 The EMT models maybe encrypted. The scope, behaviour and performance of all encrypted elements must be documented. Documentation should include behaviour and performance of all encrypted inner and outer loop control functionality such as voltage control, frequency control, protection systems, convertor controls and phase locked loop controllers (PLL). Aspects of the control system may be omitted provided the study objectives published by **The Company** in accordance with PC.A.9.4.2 are met in which case the documentation should explain any functionality not included in the EMT control system model.

PC.A.9.9.3 The EMT model shall:

i) have adjustable operational control parameters. For example this would be expected to include setpoints, control drops, operational limits, relay thresholds. The **User** may seek agreement from **The Company** on the list of adjustable parameters prior to submission of the model.

ii) be based on plant design and validated against testing of the **Plant and Apparatus** (See Model Validation )

iii) include all control systems from outer loop control down to inner and switching functions

iv) represent all electrical, mechanical and control features appropriate for the **Plant** and **Apparatus** including switching algorithums of power convertors applicable to studies described by **The Company**.

v) Have all appropriate protection systems modelled for power system transient stability analysis including balanced and unbalanced fault conditions, **Frequency** and voltage disturbances configured to match the site specific installation of the **Plant** and **Apparatus**. Any protections which relate to multiple disturbances should have an option to be disabled.

vi) Allow **Plant** and **Apparatus** to be scaled where appropriate in accordance with good industry practice. For example representation of multiple **Power Park Units** by a single equivalent unit.

vii) Have time steps which must be appropriate for the accurate representation of the switching algorithms used in the **Plant and Apparatus** and compatible with study time steps down to 10us.

viii) Be portable between network models which may be any size between a single machine infinite bus power system representation and a full multi node power system network depending on the studies that need to be undertaken.

ix) Allow multiple instances within a network and be compatible with other control system models within a network.

x) Be capable of self initiation to **User** defined terminal conditions within 4 seconds of the simulation time when connected to an equivalent Thevenin source. In the case of complex models **The Company** may agree a self initiation simulation time within 6 seconds.

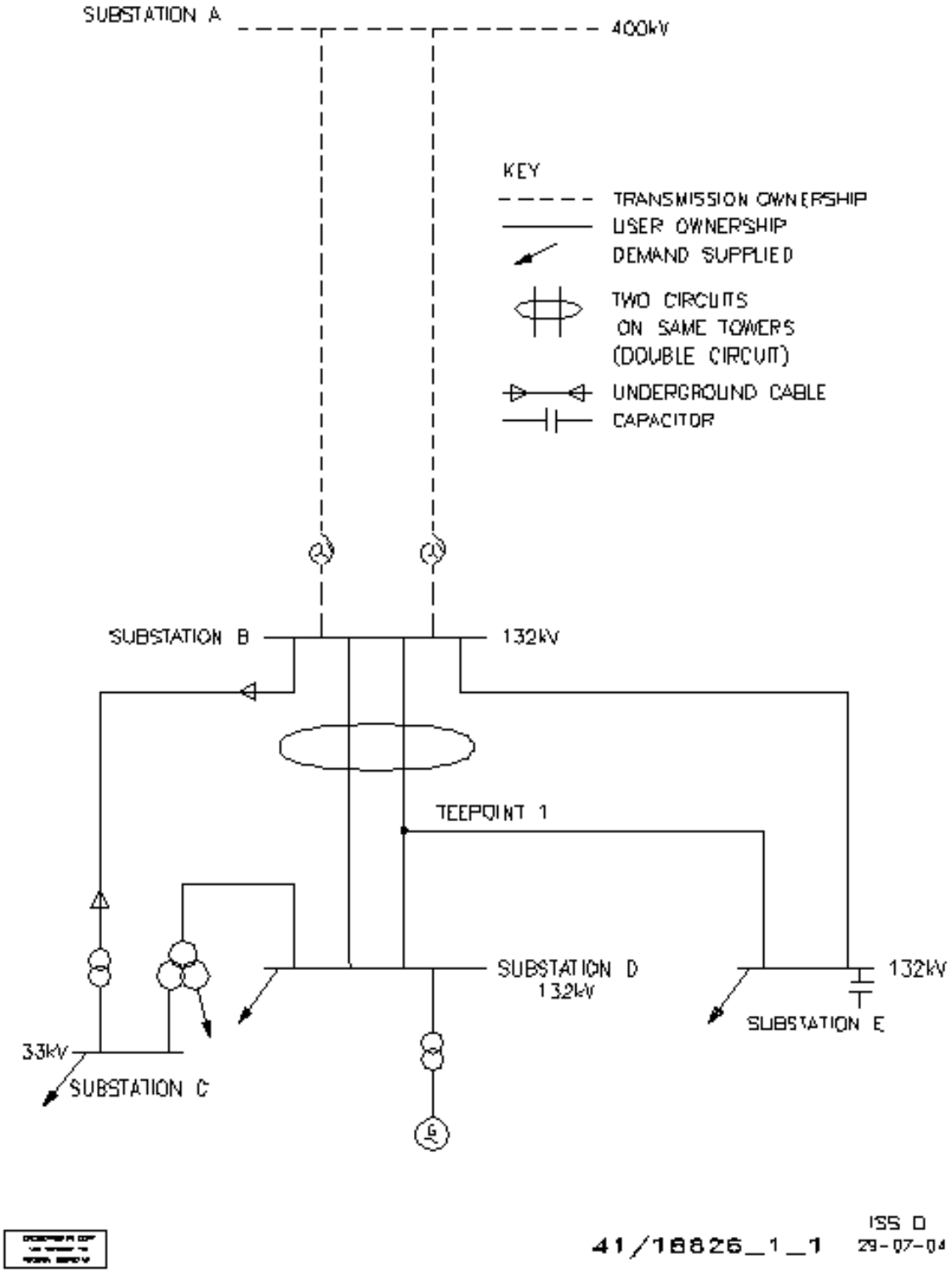
xi) Warn the **User** by way of an output message when **System** conditions exceed the operational limits of the **Plant** and **Apparatus** or are not valid for continued operation.

xii) Be able to be initialised from a snapshot of network conditions

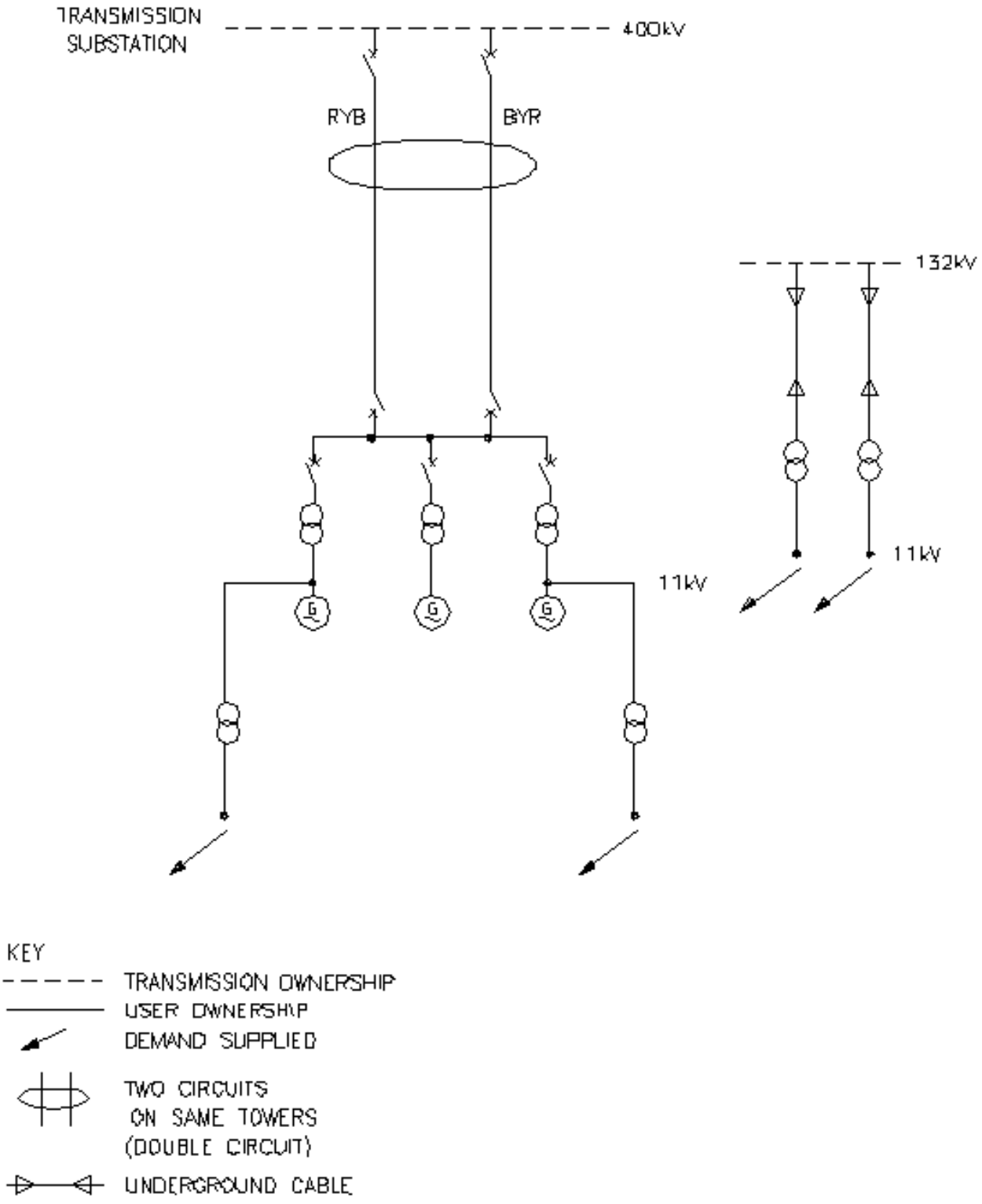
## APPENDIX B - SINGLE LINE DIAGRAMS

PC.B.1 The diagrams below show three examples of single line diagrams, showing the detail that should be incorporated in the diagram. The first example is for an **Network Operator** connection, the second for a **Generator** connection, the third for a **Power Park Module** electrically equivalent system.

**Network Operator** Single Line Diagram



**Generator** Single Line Diagram

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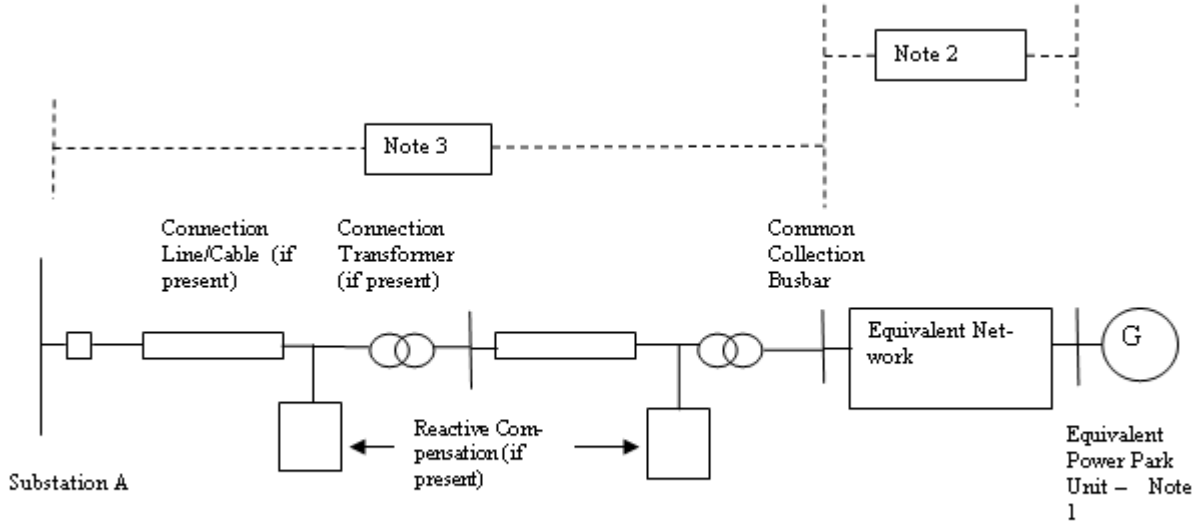
**Power Park Module** Single Line Diagram




Notes:

(1) The electrically equivalent **Power Park Unit** consists of a number of actual **Power Park Units** of the same type ie. any equipment external to the **Power Park Unit** terminals is considered as part of the equivalent network. **Power Park Units** of different types shall be included in separate electrically equivalent **Power Park Units**. The total number of equivalent **Power Park Units** shall represent all of the actual **Power Park Units** in the **Power Park Module** (which could be a **DC Connected Power Park Module**).

(2) Separate electrically equivalent networks are required for each different type of electrically equivalent **Power Park Unit**. The electrically equivalent network shall include all equipment between the **Power Park Unit** terminals and the **Common Collection Busbar**.

(3) All **Plant** and **Apparatus** including the circuit breakers, transformers, lines, cables and reactive compensation plant between the **Common Collection Busbar** and Substation A shall be shown.

## APPENDIX C - TECHNICAL AND DESIGN CRITERIA

PC.C.1 Planning and design of the **SPT** and **SHETL Transmission Systems** is based generally, but not totally, on criteria which evolved from joint consultation among various **Transmission Licensees** responsible for design of the **National Electricity Transmission System**.

PC.C.2 The above criteria are set down within the standards, memoranda, recommendations and reports and are provided as a guide to system planning. It should be noted that each scheme for reinforcement or modification of the **Transmission System** is individually designed in the light of economic and technical factors associated with the particular system limitations under consideration.

PC.C.3 The tables below identify the literature referred to above, together with the main topics considered within each document.

### PART 1 – SHETL's TECHNICAL AND DESIGN CRITERIA

| ITEM No. | DOCUMENT | REFERENCE No. |
|---|---|---|
| 1 | National Electricity Transmission System Security and Quality of Supply Standard | Version [ ] |
| 2 | System Phasing | TPS 13/4 |
| 3 | Not used | |
| 4 | Voltage fluctuations and the connection of disturbing equipment to transmission systems and distribution networks in the United Kingdom | EREC P28 Issue 2 |
| 5 | EHV or HV Supplies to Induction Furnaces<br><br>Voltage unbalance limits.<br>Harmonic current limits. | ER P16 (Supported by ACE Report No.48) |
| 6 | Planning Levels for Harmonic Voltage Distortion and the Connection of Non-Linear Loads to Transmission Systems and Public Electricity Supply Systems in the United Kingdom<br><br>Harmonic distortion (waveform).<br>Harmonic voltage distortion.<br>Harmonic current distortion.<br>Stage 1 limits.<br>Stage 2 limits.<br>Stage 3 Limits<br>Addition of Harmonics<br>Short Duration Harmonics<br>Site Measurements | ER G5 (Supported by ACE Report No.73) |
| 7 | AC Traction Supplies to British Rail<br><br>Type of supply point to railway system.<br>Estimation of traction loads.<br>Nature of traction current.<br>System disturbance estimation.<br>Earthing arrangements. | ER P24 |

| ITEM No. | DOCUMENT | REFERENCE No. |
|---|---|---|
| 8 | Operational Memoranda | (SOM) |
| | Main System operating procedure. | SOM 1 |
| | Operational standards of security. | SOM 3 |
| | Voltage and reactive control on main system. | SOM 4 |
| | System warnings and procedures for instructed load reduction. | SOM 7 |
| | Continuous tape recording of system control telephone messages and instructions. | SOM 10 |
| | Emergency action in the event of an exceptionally serious breakdown of the main system. | SOM 15 |
| 9 | Planning Limits for Voltage Unbalance in the United Kingdom. | ER P29 |

The applicable **SHETL's** technical and design criteria shall also be used in the design and development of a **Competitively Appointed Transmission Licensee's System** having a **Competitively Appointed Transmission Licensee's Interface Point** to **SHETL's Transmission System**.

**PART 2 - SPT's TECHNICAL AND DESIGN CRITERIA**

| ITEM No. | DOCUMENT | REFERENCE No. |
|---|---|---|
| 1 | National Electricity Transmission System Security and Quality of Supply Standard | Version [ ] |
| 2 | System Phasing | TDM 13/10,002 Issue 4 |
| 3 | Not used | |
| 4 | Voltage fluctuations and the connection of disturbing equipment to transmission systems and distribution networks in the United Kingdom | EREC P28 Issue 2 |
| 5 | EHV or HV Supplies to Induction Furnaces<br><br>Voltage Unbalance limits.<br>Harmonic current limits. | ER P16 (Supported by ACE Report No.48) |
| 6 | Planning Levels for Harmonic Voltage Distortion and the Connection of Non-Linear Loads to Transmission Systems and Public Electricity Supply Systems in the United Kingdom<br><br>Harmonic distortion (waveform).<br>Harmonic voltage distortion.<br>Harmonic current distortion.<br>Stage 1 limits.<br>Stage 2 limits.<br>Stage 3 Limits<br>Addition of Harmonics<br>Short Duration Harmonics<br>Site Measurements | ER G5 (Supported by ACE Report No.73) |
| 7 | AC Traction Supplies to British Rail<br><br>Type of supply point to railway system.<br>Estimation of traction loads.<br>Nature of traction current.<br>System disturbance estimation.<br>Earthing arrangements. | ER P24 |

The applicable **SPT's** technical and design criteria shall also be used in the design and development of a **Competitively Appointed Transmission System** having a **Competitively Appointed Transmission Licensee Interface Point** to **SPT's Transmission System**.

## APPENDIX D - DATA NOT DISCLOSED TO A RELEVANT TRANSMISSION LICENSEE

PC.D.1 Pursuant to PC.3.4, **The Company** will not disclose to a **Relevant Transmission Licensee** data items specified in the below extract:

| PC REFERENCE | DATA DESCRIPTION | UNITS | DATA CATEGORY |
|---|---|---|---|
| PC.A.3.2.2 (f) (i) | **(i)** For **GB Code Users**<br><br>The **Generator Performance Chart** at the **Generating Unit** stator terminals<br><br>**(ii)** For **EU Code Users:-**<br><br>The **Power Generating Module Performance Chart**, and **Synchronous Generating Unit Performance Chart;** | | **SPD** |
| PC.A.3.2.2 (b) | **Output Usable** (on a monthly basis) | MW | **SPD** |
| PC.A.5.3.2 (d) Option 1 (iii) | GOVERNOR AND ASSOCIATED PRIME MOVER PARAMETERS<br><br>Option 1<br><br>BOILER & STEAM TURBINE DATA | | |
| | Boiler time constant (Stored **Active Energy**) | S | **DPD II** |
| | HP turbine response ratio: (Proportion of **Primary Response** arising from HP turbine) | % | **DPD II** |
| | HP turbine response ratio: (Proportion of **High Frequency Response** arising from HP turbine) | % | **DPD II** |
| Part of PC.A.5.3.2 (d) Option 2 (i) | Option 2<br><br>All **Generating Units (**including **Synchronous Generating Units** forming part of a **Synchronous Power Generating Module**)<br><br>**Governor Deadband** or<br>(**Frequency Response Deadband** and **Frequency Response Insensitivity**)***** | | |
| | - Maximum Setting | ±Hz | **DPD II** |
| | - Normal Setting | ±Hz | **DPD II** |
| | - Minimum Setting | ±Hz | **DPD II** |
| | *(Note **GB Generators** who are not required to satisfy the requirements of the **European Connection Conditions** do not need to supply **Frequency Response Deadband** or **Frequency Response Insensitivity** data). | | |
| Part of PC.A.5.3.2 (d) Option 2 (ii) | **Steam Units** | | |

| PC REFERENCE | DATA DESCRIPTION | UNITS | DATA CATEGORY |
|---|---|---|---|
| | Reheater Time Constant | sec | **DPD II** |
| | Boiler Time Constant | sec | **DPD II** |
| | HP Power Fraction | % | **DPD II** |
| | IP Power Fraction | % | **DPD II** |
| Part of PC.A.5.3.2 (d) Option 2 (iii) | **Gas Turbine Units**<br><br>Waste Heat Recovery Boiler Time Constant | | |
| Part of PC.A.5.3.2 (e) | UNIT CONTROL OPTIONS | | |
| | Maximum droop | % | **DPD II** |
| | Minimum droop | % | **DPD II** |
| | Maximum **Governor Deadband** or (Maximum Frequency **Response Deadband** and Maximum **Frequency Response Insensitivity**)* | ±Hz | **DPD II** |
| | Normal **Governor Deadband** or (normal **Frequency Response Deadband** and normal **Frequency Response Insensitivity)*** | ±Hz | **DPD II** |
| | Minimum **Governor Deadband** or (minimum **Frequency ResponseDeadband** and minimum **Frequency Response Insensitivity**)* | ±Hz | **DPD II** |
| | Maximum Output **Governor Deadband** or (Maximum Output **Frequency Response Deadband** and Maximum Output **Frequency Response Insensitivity**)* | ±MW | **DPD II** |
| | Normal Output **Governor Deadband** or (Normal Output **Frequency Response Deadband** and Normal Output **Frequency Response Insensitivity)*** | ±MW | **DPD II** |
| | Minimum Output **Governor Deadband** or (Minimum Output **Frequency Response Deadband** and Minimum Output **Frequency Response Insensitivity**)* | ±MW | **DPD II** |
| | (Note **Generators** who are not required to satisfy the requirements of the **European Connection Conditions** do not need to supply **Frequency Response Deadband** and **Frequency Response Insensitivity** data).<br><br>Frequency settings between which Unit Load Controller droop applies: | | |
| | Maximum | Hz | **DPD II** |
| | Normal | Hz | **DPD II** |
| | Minimum | Hz | **DPD II** |
| | Sustained response normally selected | Yes/No | **DPD II** |

| PC REFERENCE | DATA DESCRIPTION | UNITS | DATA CATEGORY |
|---|---|---|---|
| PC.A.3.2.2 (f) (ii) | Performance Chart of a **Power Park Modules** (including **DC Connected Power Park Modules**) at the connection point | | **SPD** |
| PC.A.3.2.2 (b) | **Output Usable** (on a monthly basis) | MW | **SPD** |
| PC.A.3.2.2 (e) and (j) | **DC CONVERTER STATION** AND **HVDC SYSTEM** DATA | | |
| | **ACTIVE POWER** TRANSFER CAPABILITY (PC.A.3.2.2) | | |
| | Import MW available in excess of **Registered Import Capacity**. | MW | **SPD** |
| | Time duration for which MW in excess of **Registered Import Capacity** is available | Min | **SPD** |
| | Export MW available in excess of **Registered Capacity**. | MW | **SPD** |
| | Time duration for which MW in excess of **Registered Capacity** is available | Min | **SPD** |
| Part of PC.A.5.4.3.3 | LOADING PARAMETERS | | |
| | MW Export | MW | **SPD** |
| | Nominal loading rate | MW/s | **DPD I** |
| | Maximum (emergency) loading rate | MW/s | **DPD I** |
| | MW Import | | |
| | Nominal loading rate | MW/s | **DPD I** |
| | Maximum (emergency) loading rate | MW/s | **DPD I** |

## APPENDIX E - OFFSHORE TRANSMISSION SYSTEM AND OTSDUW PLANT AND APPARATUS TECHNICAL AND DESIGN CRITERIA

PC.E.1 In the absence of any relevant **Electrical Standards**, **Offshore Transmission Licensees** and **Generators** undertaking **OTSDUW** are required to ensure that all equipment used in the construction of their network is:

(i) Fully compliant and suitably designed to any relevant **Technical Specification**;

(ii) Suitable for use and operation in an **Offshore** environment, where such parts of the **Offshore Transmission System** and **OTSDUW Plant and Apparatus** are located in **Offshore Waters** and are not installed in an area that is protected from that **Offshore** environment, and

(iii) Compatible with any relevant **Electrical Standards** or **Technical Specifications** at the **Offshore Grid Entry Point** and **Interface Point**.

PC.E.2 The table below identifies the technical and design criteria that will be used in the design and development of an **Offshore Transmission System** and **OTSDUW Plant and Apparatus**.

| ITEM No. | DOCUMENT | REFERENCE No. |
|---|---|---|
| 1 | National Electricity Transmission System Security and Quality of Supply Standard | Version [ ] |
| 2* | Voltage fluctuations and the connection of disturbing equipment to transmission systems and distribution networks in the United Kingdom | EREC P28 Issue 2 |
| 3* | Planning Levels for Harmonic Voltage Distortion and the Connection of Non-Linear Loads to Transmission Systems and Public Electricity Supply Systems in the United Kingdom | ER G5 |
| 4* | Planning Limits for Voltage Unbalance in the United Kingdom | ER P29 |

* Note:- Items 2, 3 and 4 above shall only apply at the **Interface Point**.

## APPENDIX F - OTSDUW DATA AND INFORMATION AND OTSDUW NETWORK DATA AND INFORMATION

PC.F.1 Introduction

PC.F.1.1 Appendix F specifies data requirements to be submitted to **The Company** by **Users** and **Users** by **The Company** in respect of **OTSDUW**.

PC.F.1.2 Such **User** submissions shall be in accordance with the **OTSDUW Development and Data Timetable** in a **Construction Agreement**.

PC.F.1.3 Such submissions shall be issued to **The Company** with the offer of a **CUSC Contract** in the case of the data in Part 1 and otherwise in accordance with the **OTSDUW Development and Data Timetable** in a **Construction Agreement**.

PC.F.2. OTSDUW Network Data and Information

PC.F.2.1 With the offer of a **CUSC Contract** under the **OTSDUW Arrangements The Company** shall provide:

(a) the site specific technical design and operational criteria for the **Connection Site**;

(b) the site specific technical design and operational criteria for the **Interface Point**, and

(c) details of **The Company's** preliminary identification and consideration of the options available for the **Interface Point** in the context of the **User's** application for connection or modification, the preliminary costs used by **The Company** in assessing such options and the **Offshore Works Assumption**s including the assumed **Interface Point** identified during these preliminary considerations.

PC.F.2.2 In accordance with the **OTSDUW Development and Data Timetable** in a **Construction Agreement The Company** shall provide the following information and data to a **User**:

(a) equivalent of the fault infeed or fault level ratings at the Interface Point (as identified in the **Offshore Works Assumptions**)

(b) notification of numbering and nomenclature of the **HV Apparatus** comprised in the **OTSDUW**;

(i) past or present physical properties, including both actual and designed physical properties, of **Plant** and **Apparatus** forming part of the **National Electricity Transmission System** at the Interface Point at which the **OTSUA** will be connected to the extent it is required for the design and construction of the **OTSDUW**, including but not limited to:

(ii) the voltage of any part of such **Plant** and **Apparatus**;

(iii) the electrical current flowing in or over such **Plant** and **Apparatus**;

(iv) the configuration of any part of such **Plant** and **Apparatus**

(v) the temperature of any part of such **Plant** and **Apparatus**;

(vi) the pressure of any fluid forming part of such **Plant** and **Apparatus**

(vii) the electromagnetic properties of such **Plant** and **Apparatus**; and

(viii) the technical specifications, settings or operation of any **Protection Systems** forming part of such **Plant** and **Apparatus**.

(c) information necessary to enable the **User** to harmonise the **OTSDUW** with construction works elsewhere on the **National Electricity Transmission System** that could affect the **OTSDUW**;

(d) information related to the current or future configuration of any circuits of the **Onshore Transmission System** with which the **OTSUA** are to connect;

(e) any changes which are planned on the **National Electricity Transmission System** in the current or following six **Financial Years** and which will materially affect the planning or development of the **OTSDUW**.

PC.F.2.3 At the **Users** reasonable request, additional information and data in respect of the **National Electricity Transmission System** shall be provided.

PC.F.2.4 OTSDUW Data And Information

PC.F.2.4.1 In accordance with the **OTSDUW Development and Data Timetable** in a **Construction Agreement**, the **User** shall provide to **The Company**, the following information and data relating to the **OTSDUW Plant and Apparatus** in accordance with Appendix A of the **Planning Code**.

**< END OF PLANNING CODE >**

# OPERATING CODE NO. 9
**(OC9)**

## CONTINGENCY PLANNING

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OC9.1 INTRODUCTION

**Operating Code No.9** ("**OC9**") covers the processes and procedures by which **The Company** in coordination and liaison with **Users**, will restore the **Total System** or parts of the **System** following a **Total Shutdown** or **Partial Shutdown**.

OC9.1.1 Approach to System Restoration

**The Company** is obliged through its Licence to achieve **System Restoration** within the parameters of the **Electricity System Restoration Standard**.

Electricity **System Demand** in the context of the "**Electricity System Restoration Standard**", is considered by **The Company** to be the forecast peak **National Demand** which would have occurred within the 24 hour period following the start of the **Total Shutdown** or **Partial Shutdown** had the **Total Shutdown** or **Partial Shutdown** not occurred. Under the **Electricity System Restoration Standard**, 60% of peak **National Demand** is to be restored across all **System Restoration Regions** in 24 hours and 100% peak **National Demand** is to be restored across **System Restoration Regions** in 5 days.

Following a **Total Shutdown** or **Partial Shutdown**, there are two ways in which the **Total System** (or the disconnected part of the **System** in the case of a **Partial Shutdown**) can be re-established. These being a top-down approach using **Local Joint Restoration Plans** or a bottom-up approach using **Distribution Restoration Zone Plans**.

Any **Local Joint Restoration Plan** and/or **Distribution Restoration Zone Plan** comprising common **Transmission Licensees's**, **Network Operator's** or **Restoration Contractor's** assets cannot be activated at the same time. However, this would not preclude a **Local Joint Restoration Plan** or **Distributed Restoration Zone Plan** from being activated at the same site(s) where there is segregation between them.

OC9.1.2 Re-Synchronisation of Power Islands

Following the establishment of **Power Islands** (either through the implementation of **Local Joint Restoration Plans** or **Distribution Restoration Zone Plans**), **The Company** will then co-ordinate the **Re-Synchronisation** of parts of the **Total System** which have become **Out of Synchronism** with each other irrespective of whether or not a **Total Shutdown** or **Partial Shutdown** has occurred.

OC9.1.3 Joint System Incident Procedure

A **Joint System Incident** procedure requires the establishment of communication routes and arrangements between senior management representatives of **The Company** and **Users** involved in, or who may be involved in, an actual or potential serious or widespread disruption to the **Total System** or a part of the **Total System**, which requires, or may require, urgent managerial response, day or night, but which does not fall within the provisions of OC9.1.5.

OC9.1.4 **Relevant Transmission Licensees** shall comply with OC9.4 and OC9.5 as provided for in STCP 06-1 and any relevant **Local Joint Restoration Plan** or **Distribution Restoration Zone Plan** or OC9 **De-Synchronised Island Procedure** where and to the extent that such matters apply to them.

OC9.1.5 Directions Issued by the Secretary of State

It should be noted that under section 96 of the **Act**, the **Secretary of State** may give directions to **The Company** and/or any **Generator** and/or any **Supplier**, for the purpose of "mitigating the effects of any civil emergency which may occur" (ie. for the purposes of planning for a civil emergency); a civil emergency is defined in the **Act** as "any natural disaster or other emergency which, in the opinion of the **Secretary of State**, is or may be likely to disrupt electricity supplies". Under the Energy Act 1976, the **Secretary of State** has powers to make orders and give directions controlling the production, supply, acquisition or use of electricity, where an Order in Council under section 3 is in force declaring that there is an actual or imminent emergency affecting electricity supplies. In the event that any such directions are given, or orders made under the **Energy Act 1976**, the provisions of the **Grid Code** will be suspended in so far as they are inconsistent with them.

OC9.2 OBJECTIVE

The overall objectives of **OC9** are:

OC9.2.1 To achieve the requirements of the **Electricity System Restoration Standard**, taking into account the capability of **Restoration Contractor's Plant** and **Apparatus** as well as other **Users' Plant** and **Apparatus** capabilities, including **Embedded Generating Units** and **External Interconnections** and the operational constraints of the **Total System**.

OC9.2.2 To initiate the restoration process through the activation of **Local Joint Restoration Plans** and/or **Distribution Restoration Zone Plans** followed by the subsequent **Re-Synchronisation** and expansion of **Power Islands**.

OC9.2.3 To achieve the **Re-Synchronisation** of parts of the **Total System** which have become **Out of Synchronism** with each other.

OC9.2.4 To ensure that communication routes and arrangements are available to enable senior management representatives of **The Company** and **Users**, who are authorised to make binding decisions on behalf of **The Company** or the relevant **User**, as the case may be, to communicate with each other in the situation described in OC9.1.3.

OC9.2.5 To describe the role that **The Company**, **Relevant Transmission Licensees**, **Network Operators** and **Restoration Contractors** may have in the restoration processes as detailed in the relevant **OC9 De-Synchronised Island Procedures**, **Local Joint Restoration Plans** and **Distribution Restoration Zone Plans**.

OC9.2.6 To identify and address as far as possible the events and processes necessary to enable the restoration of the **Total System**, after a **Total Shutdown** or **Partial Shutdown**. This is likely to require the following key processes to be implemented, typically, but not necessarily, in the order given below:

(i) Selectively implement **Local Joint Restoration Plans**

(ii) Selectively implement **Distribution Restoration Zone Plans** in conjunction with **Network Operators**

(iii) Expand **Power Islands** to supply **Power Stations**

(iv) Expand and merge **Power Islands** leading to **Total System** energisation

(v) Selectively reconnect **Demand**

(vi) Facilitate and co-ordinate returning the **Total System** back to normal operation

(vii) Resumption of the **Balancing Mechanism** if suspended in accordance with the provisions of the **BSC**.

OC9.3 SCOPE

OC9.3.1 **OC9** applies to **The Company** and to **Users**, which in **OC9** means:-

(a) **Generators**;

(b) **Network Operators**;

(c) **Non-Embedded Customers**;

(d) **HVDC System Owners**;

(e) **DC Converter** owners including **DC Converter Station** owners

(f) **Restoration Contractors**; and

(h) **Relevant Transmission Licensees** as provided for in the **STC**.

OC9.3.2 The procedure for the establishment of emergency support/contingency planning between **The Company** and **Externally Interconnected System Operators** is set out in the **Interconnection Agreement** with each **Externally Interconnected System Operator**.

OC9.4 SYSTEM RESTORATION

Total Shutdown and Partial Shutdown

OC9.4.1 A "**Total Shutdown**" is the situation existing when all generation has ceased and there is no electricity supply from **External Interconnections**. Therefore, the **Total System** has shutdown with the result that it is not possible for the **Total System** to begin to function again without **The Company's** directions relating to **System Restoration**.

OC9.4.2 A "**Partial Shutdown**" is the same as a **Total Shutdown** except that all generation has ceased in a separate part of the **Total System** and there is no electricity supply from **External Interconnections** or other parts of the **Total System** to that part of the **Total System**. 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 **The Company's** directions relating to **System Restoration**.

OC9.4.3 During a **Total Shutdown** or **Partial Shutdown** and during the subsequent recovery, the **Licence Standards** may not apply and the **Total System** may be operated outside normal voltage and **Frequency** standards.

OC9.4.4 In a **Total Shutdown** and in a **Partial Shutdown** and during the subsequent recovery, it is likely to be necessary for **The Company** to issue **Emergency Instructions** in accordance with BC2.9.

OC9.4.5 Contribution to System Restoration

**The Company** will initially start to restore the **System** following a **Total Shutdown** or **Partial Shutdown** by issuing instructions directly to **Restoration Contractors** through one or more **Local Joint Restoration Plans** as provided for in OC9.4.5.1 and/or by instructing **Network Operators** to activate one or more **Distribution Restoration Zone Plans** as provided for in OC9.4.5.2.

OC9.4.5.1 Local Joint Restoration

OC9.4.5.1.1 **Local Joint Restoration Plans** are dependent upon **Anchor Restoration Contractors** who upon instruction from **The Company** (or **Relevant Transmission Licensee** in Scotland), shall **Start-Up** their **Anchor Plant** from **Shutdown** and energise a part of the **Total System**, within two hours, without an external electrical power supply. **Local Joint Restoration Plans** may also be dependent upon **Top Up Restoration Contractors**. A **Local Joint Restoration Plan** may include more than one **Restoration Contractor** whose **Plant** has an **Anchor Plant Capability** or **Top Up Capability**. When a **Local Joint Restoration Plan** is activated, only one **Restoration Contractor** will operate as the **Anchor Generator** with the other **Restoration Contractors** potentially taking roles as **Top-Up Restoration Contractors**. The **Local Joint Restoration Plan** will detail how these responsibilities will be allocated.

OC9.4.5.1.2 **Local Joint Restoration Plans** will be produced jointly by **The Company**, **Relevant Transmission Licensees**, relevant **Restoration Contractors** and relevant **Network Operators** in accordance with the provisions of OC9.4.7.6.1(a). The **Local Joint Restoration Plan** will detail the agreed method and procedure by which **Anchor Plant** will energise part of the **Total System** and in combination with **Top Up Restoration Plant** (where necessary) to meet complementary local **Demand** so as to form a **Power Island**.

OC9.4.5.2 Distribution Restoration Zones

OC9.4.5.2.1 **Distribution Restoration Zone Plans** are dependent upon **Anchor Restoration Contractors** who, upon instruction from relevant **Network Operators**, shall **Start-Up** their **Anchor Plant** from **Shutdown** and energise a part of a **Network Operator's System** within eight hours, without an external electrical power supply. A **Distribution Restoration Zone Plan** may also be dependent upon **Top Up Restoration Contractors**.

OC9.4.5.2.2 For each **Distribution Restoration Zone**, a **Distribution Restoration Zone Plan** will be produced jointly by the **Network Operator**, **The Company**, **Relevant Transmission Licensee**, and **Restoration Contractors** in accordance with the provisions of OC9.4.7.6.1(b). The **Distribution Restoration Zone Plan** will detail the agreed method and procedure by which an **Anchor Plant** will energise part of the **Total System** and in combination with **Top Up Restoration Plant** (where necessary) meet complementary local **Demand** so as to form a **Power Island**. A **Distribution Restoration Zone Plan** may include more than one **Restoration Contractor** whose **Plant** has an **Anchor Plant Capability** or **Top Up Restoration Capability**. When a **Distribution Restoration Zone Plan** is activated, only one **Restoration Contractor** will operate as the **Anchor Restoration Contractor** with the other **Restoration Contractors** potentially taking roles as **Top-Up Restoration Contractors**. The **Distribution Restoration Zone Plan** will detail how these responsibilities will be allocated.

OC9.4.6 Situations requiring System Restoration

In the event of a **Total Shutdown** or **Partial Shutdown**, **The Company** will, as soon as reasonably practical, inform **Users** (or, in the case of a **Partial Shutdown**, **Users** which in **The Company's** opinion need to be informed) and the **BSCCo** that a **Total Shutdown**, or, as the case may be, a **Partial Shutdown**, exists and that **The Company** intends to implement **System Restoration**. **The Company** shall (as soon as is practicable) determine, in its reasonable opinion, the time and date with effect from which the **Total Shutdown** or **Partial Shutdown** commenced and notify the **BSCCo** of that time and date.

In the event of a **Total Shutdown** and following such notification, in accordance with the provisions of the **BSC**, the **BSCCo** will determine the **Settlement Period** with effect from which the **Balancing Mechanism** is suspended.

In the event of a **Partial Shutdown** and following such notification, the **Balancing Mechanism** will not be suspended until such time and date that the **Market Suspension Threshold** has been met, or deemed to have been met, in accordance with the provisions of the **BSC**. **The Company** shall carry out the monitoring activities required by paragraph G3.1 of the **BSC**.

Following determination by **The Company** pursuant to its obligations under the **BSC** that the **Market Suspension Threshold** has been met, or deemed to have been met, **The Company** shall (as soon as practicable) inform the **BSCCo** of that time and date at which the **Market Suspension Threshold** was met, or deemed to have been met, and the **BSCCo** will determine the **Settlement Period** in accordance with the provisions of the **BSC** with effect from which the **Balancing Mechanism** will be suspended.

Should **The Company** determine that the **Total System** is capable of returning to normal operation without meeting the **Market Suspension Threshold**, **The Company** will follow the procedure given in OC9.4.7.11.

**System Restoration** will conclude with effect from the time and date determined in accordance with OC9.4.7.6.3(d).

In respect of **Scottish Transmission Systems**, in exceptional circumstances, as specified in the **Local Joint Restoration Plan**, **SPT** or **SHETL**, may invoke such **Local Joint Restoration Plan** for its own **Transmission System**, **Scottish Offshore Transmission Systems** and relevant Scottish **Competitively Appointed Transmission Licensee's Transmission Systems**. Under such circumstances, **SPT** or **SHETL** may instruct relevant **Network Operators** to activate one or more **Distribution Restoration Zone Plans**.

OC9.4.7 SYSTEM RESTORATION PROCEDURE

OC9.4.7.1 The procedure necessary for a recovery from a **Total Shutdown** or **Partial Shutdown** is known as a **System Restoration**. 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 shutdown.

OC9.4.7.2 The complexities and uncertainties of recovery from a **Total Shutdown** or **Partial Shutdown** require that **OC9** is sufficiently flexible in order to accommodate the full range of **User's Plant** and **Apparatus** and **Total System** characteristics and operational possibilities, and this precludes the setting out in the **Grid Code** itself of concise chronological sequences. The overall strategy will, in general, include the overlapping phases of the use of generating **Plant**, at an isolated **Power Station**, or isolated **HVDC System** or isolated **DC Converter Station**, together with complementary local **Demand**, termed **Power Islands**, step by step integration of these **Power Islands** into larger sub-systems which includes utilising the procedures in OC9.5 (**Re-Synchronisation** of **Power Islands**) and eventually re-establishment of the complete **Total System**.

The Company Instructions

OC9.4.7.3 **The Company** will determine and instruct relevant **Users** to start **System Restoration**. These instructions will normally recognise any applicable **Local Joint Restoration Plan** and/or **Distribution Restoration Zone Plan**. **User's** shall abide by **The Company's** instructions during **System Restoration**, even if these conflict with the general overall strategy outlined in OC9.4.7.6.3 or any applicable **Local Joint Restoration Plan** and/or **Distribution Restoration Zone Plan** although a **User** may still reject an **Emergency Instruction** but only on safety grounds (relating to personnel or plant) and this must be notified to **The Company** immediately by telephone in accordance with the requirements of BC2.9.2.1. **The Company's** and/or **Network Operator's** instructions may (although this list should not be regarded as exhaustive) be issued to;-

(a) **Restoration Contractors** relating to the start of supplying **Active Power** and subsequent pick up of **Demand**;
(b) **Network Operators** or **Non-Embedded Customers** relating to the restoration of **Demand**;
(c) **Generators** or **HVDC System Owners** or **DC Converter Station** owners relating to the preparations for starting to supply **Active Power** when an external power supply is made available to it;
(d) **Network Operators** to activate a **Distribution Restoration Zone Plan**.

Each of the above cases may include the requirement to undertake switching.

In respect of **Scottish Transmission Systems**, **SPT** and **SHETL** will act on **The Company's** behalf in accordance with its duties under the relevant **Local Joint Restoration Plan** or **Distribution Restoration Zone Plan**. **Restoration Contractors** and **Competitively Appointed Transmission Licensees** in Scotland shall abide by **SPT's** or **SHETL's** instructions given in accordance with the **Local Joint Restoration Plan** or **Network Operator's** instructions given in accordance with the **Distribution Restoration Zone Plan**.

OC9.4.7.4 (a) **System Restoration** following a **Total Shutdown** or where the **Balancing Mechanism** has been suspended following a **Partial Shutdown**

During **System Restoration** where the **Balancing Mechanism** has been suspended, all instructions by **The Company** to **Users** will be deemed to be **Emergency Instructions** under BC2.9.2.2 (iii). All such **Emergency Instructions** will recognise any differing operational capabilities (however termed) set out in the relevant **Ancillary Services Agreement** in preference to the declared operational capability as registered pursuant to **BC1** (or as amended from time to time in accordance with the **BC**).

Instructions issued to **Network Operators** in England and Wales to activate a **Distribution Restoration Zone Plan** will be issued by **The Company** as **Emergency Instructions**. **Network Operators** will then proceed in accordance with the provisions of the **Distribution Restoration Zone Plan**. Such instructions will be deemed to be **Emergency Instructions** under BC2.9.2.2 (iii). The **Network Operator** will be responsible for the operation of the **Distribution Restoration Zone** which will take into account the capabilities of **Restoration Contractors' Plant** and **Apparatus** and other **Plant** and **Apparatus** within the **Network Operator's System**. A **Restoration Contractor** may reject an **Emergency Instruction** but only on safety grounds (relating to personnel or plant) and this must be notified to **The Network Operator** immediately. Such instructions shall be pursuant to the terms of the **Distribution Restoration Zone Plan**.

In Scotland **SPT** and/or **SHETL** as relevant may issue instructions (which shall be deemed to be **Emergency Instructions**) to relevant Scottish **Network Operators** to activate one or more **Distribution Restoration Zone Plans**. **Network Operators** in Scotland will be responsible for the operation of the relevant **Distribution Restoration Zone** which will take into account the capabilities of **Restoration Contractors' Plant** and **Apparatus** and other **Plant** and **Apparatus** within the **Network Operator's System**. A **Restoration Contractor** may reject an **Emergency Instruction** but only on safety grounds (relating to personnel or plant) and this must be notified to the relevant Scottish **Network Operator** immediately. Such instructions shall be pursuant to the terms of the **Distribution Restoration Zone Plan**.

(b) **System Restoration** following a **Partial Shutdown** where the **Balancing Mechanism** has not been suspended

During a **Partial Shutdown** where the **Balancing Mechanism** has not been suspended, all instructions to **Users** connected to the **Power Island** will be deemed to be **Emergency Instructions** under BC2.9.2.2 (iv). All such **Emergency Instructions** will recognise any differing operational capabilities (however termed) set out in the relevant **Ancillary Services Agreement** in preference to the declared operational capability as registered pursuant to **BC1** (or as amended from time to time in accordance with the **BC**).

During **System Restoration** where the **Balancing Mechanism** has not been suspended, **The Company** may issue instructions to **Network Operators** in England and Wales to activate a **Distribution Restoration Zone Plan**. Such instructions will be deemed to be **Emergency Instructions** under BC2.9.2.2 (iv). The **Network Operator** will be responsible for the operation of the **Distribution Restoration Zone** which will take into account the capabilities of **Restoration Contractor's Plant** and other **Plant** and **Apparatus** within the **Network Operator's System**. Such instructions would be pursuant to the terms of the **Distribution Restoration Zone Plan**.

In Scotland, **SPT** and/or **SHETL** as relevant may issue instructions (which would be deemed to be **Emergency Instructions**) to Scottish **Network Operators**, to activate on one or more **Distribution Restoration Zone Plans**.

OC9.4.7.5 Requirements to inform **The Company** and/or **Network Operator** where a **Genset**, **HVDC System**, **DC Converter** or **Restoration Contractor's Plant** and **Apparatus** cannot operate within its safe operating limits during the **Demand** restoration process

OC9.4.7.5.1 If following the successful initiation and subsequent termination of a **Local Joint Restoration Plan** or **Distribution Restoration Zone Plan** and during the wider **System Restoration** process, any **Genset** or **HVDC System** or **DC Converter Station** or **Restoration Contractor's Plant** and **Apparatus** cannot, because of the **Demand** being experienced, keep within its safe operating parameters, the **Generator** or **HVDC System Owner** or **DC Converter Station** owner or **Restoration Contractor** shall, inform **The Company** and relevant **Network Operator**. **The Company** or relevant **Network Operator** (as appropriate) will, where possible, either instruct **Demand** to be altered or will re-configure the **Total System** or will instruct a **User** or **Restoration Contractors** to re-configure its **System** in order to alleviate the problem being experienced by the **Genset** or **HVDC System** or **DC Converter or Restoration Contractor's Plant** and **Apparatus**. If a **Local Joint Restoration Plan** or **Distribution Restoration Zone Plan** is in operation, then the arrangements set out therein shall apply. In both scenarios, **The Company** and/or **Network Operator** accepts that any decision to keep a **Genset** or **HVDC System** or **DC Converter Station** or **Restoration Contractor's Plant** and **Apparatus** operating, if outside its safe operating parameters, is one for the **User** or **Restoration Contractor** concerned alone and accepts that the **User** or **Restoration Contractor** may change output on that **Genset** or **HVDC System** or **DC Converter** or **Restoration Contractor's Plant** and **Apparatus** if it 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 **User** or **Restoration Contractor** shall inform **The Company** and/or **Network Operator** as soon as reasonably practical (unless a **Local Joint Restoration Plan** and/or **Distribution Restoration Zone Plan** is in operation in which case the arrangements set out therein shall apply). In the case of a **Distribution Restoration Zone**, where the **Network Operator** experiences situations where any **Restoration Contractor's Plant** and **Apparatus** is unable to keep within safe operating parameters and this is likely to affect the integrity and progression of the **Distribution Restoration Zone**, the **Network Operator** shall inform **The Company** without delay.

OC9.4.7.6 Local Joint Restoration Plan and Distribution Restoration Zone Plan Establishment, Testing and Provisions

OC9.4.7.6.1 Restoration Plan Establishment

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

a) For a **Local Joint Restoration Plan**, **The Company** will identify the need to introduce or modify a **Local Joint Restoration Plan** and coordinate with the relevant parties as required in this OC9.4.7.6.1.

b) For a **Distribution Restoration Zone Plan** where **The Company** and a relevant **Network Operator** agree that introducing or modifying a **Distribution Restoration Zone** may be beneficial, **The Company**, the **Relevant Transmission Licensee** (where appropriate) and the **Network Operator** shall explore the possibility of establishing a **Distribution Restoration Zone Plan** as required in this OC9.4.7.6.1.

c) The **Company**, the **Relevant Transmission Licensee** (where appropriate) and the **Network Operator** 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 Contractors**, **The Company** and the **Network Operator**.

d) For a **Distribution Restoration Zone Plan** an initial feasibility assessment carried out jointly by **The Company** and **Network Operator** may result in **The Company** running a procurement / tender process. If after discussions or analysis, **The Company**, the **Relevant Transmission Licensee** (where appropriate) and **Network Operator** agree a **Distribution Restoration Zone Plan** is not viable, then no further work to develop the **Distribution Restoration Zone Plan** needs to be carried out.

e) Each **Restoration Plan** will be in relation to a specific **Anchor Plant** and may include one of more **Top Up Restoration Plants**.

f) 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 **Local Joint Restoration Plans** or **Distribution Restoration Zone Plans** 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.

g) The **Restoration Plan** will record which **Restoration Contractors** and which **Restoration Contractor's** sites are covered by the **Restoration Plan** and set out what is required from **The Company**, the **Network Operator**, each **Relevant Transmission Licensees** and each **Restoration Contractor** should a **System Restoration** situation arise.

h) **Restoration Plans** will allow for one of several **Restoration Contractors** to take the single role of **Anchor Generator** within the **Restoration Plan** and for others to provide **Top-Up Restoration Capabilities**. When the **Restoration Plan** is activated, one of the first tasks shall be the designation of the **Anchor Generator** and confirmation of which parties are acting as **Top Up Restoration Contractors**.

i) Each **Local Joint Restoration Plan** shall be prepared by **The Company**. Each **Distribution Restoration Zone Plan** shall be prepared by the relevant **Network Operator**. In both cases the **Restoration Plan** will be agreed between **Network Operator**, **The Company**, the **Relevant Transmission Licensee** and relevant **Restoration Contractors**.

j) Each page of the **Restoration Plan** shall bear a date of issue and the issue number.

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

l) The **Restoration Plan** shall then (if its accuracy has been confirmed) be signed on behalf of **The Company**, the **Network Operator**, each **Relevant Transmission Licensee** and each relevant **Restoration Contractor** by way of written confirmation of its accuracy.

m) Once agreed under this OC9.4.7.6.1, the procedure will become a **Restoration Plan** under the Grid Code and (subject to any change pursuant to this OC9) will apply to **The Company**, the **Network Operator**, the **Relevant Transmission Licensees** and the relevant **Restoration Contractors** as if it were part of the Grid Code.

n) A copy of each signed **Local Joint Restoration Plan** will be distributed by **The Company** to the **Network Operator**, each **Relevant Transmission Licensee** and to each **Restoration Contractor** accompanied by a note indicating the date of implementation.

o) A copy of each signed **Distribution Restoration Zone Plan** will be distributed by the **Network Operator** to **The Company**, each **Relevant Transmission Licensee** and to each **Restoration Contractor** accompanied by a note indicating the date of implementation.

p) **The Company**, **Network Operators**, the **Relevant Transmission Licensees** and **Restoration Contractors** must make the **Restoration Plan** readily available to the relevant operational staff.

q) Each **Restoration Plan** will include the test criteria to be satisfied by each **Restoration Contractor's Plant** and **Apparatus** when subject to the testing requirements of OC5.7.

r) If any party to a **Restoration Plan** becomes aware that a change is needed to that **Restoration Plan**, it shall, in the case of **Local Joint Restoration Plan**, contact **The Company** or in the case of a **Distribution Restoration Zone Plan**, the **Network Operator** to initiate a discussion between **The Company**, or the **Network Operator** and the relevant parties to seek to agree the relevant change. The principles applying to establishing or modifying a **Restoration Plan** under this OC9.4.7.6.1 shall apply to such discussions and to any consequent changes.

OC9.4.7.6.2 Restoration Plan Testing

**The Company**, **Relevant Transmission Licensees**, the **Network Operator** and the relevant **Restoration Contractors** shall conduct regular joint exercises of the **Restoration Plan** to which they are parties. The objectives of such exercises include:

- To test the effectiveness of the **Restoration Plan**;
- To provide for joint training of the parties in respect of the **Restoration Plan**;
- To maintain the parties' awareness and familiarity of the **Restoration Plan**;
- To promote understanding of each party's role under the **Restoration Plan**; and
- To identify any improvement areas which should be incorporated into the **Restoration Plan**.

**The Company** shall propose to the parties to a **Restoration Plan** a date for the exercise to take place. All the **Restoration Plan** 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 Plan** will be agreed by all parties, but will not be less than once every 3 years. These exercises shall be run as part of the wider assurance activities as provided for under OC5.7.4

OC9.4.7.6.3 Restoration Plan Provisions

The following provisions in this OC9.4.7.6.3 apply in relation to **Restoration Plans**. For **Local Joint Restoration Plans**, **The Company** (or in Scotland the relevant **Transmission Licensee** as assigned by **The Company** under STCP 06-1) are designated as the lead operator; for **Distribution Restoration Zone Plan**s, the **Network Operator** is the lead operator.

(a) Where the lead operator, issues instructions which conflict with a **Restoration Plan** these instructions will take precedence over the requirements of the **Restoration Plan** (as set out in OC9.4.7.6.1).

i.) 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.

ii.) 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 OC9.4.7.6.3(d) below.

(b) The preparation of each **Restoration Plan** shall include a check whether any network assets cited in another **Local Joint Restoration Plan** or another **Distribution Restoration Zone Plan** are included in the plan, and if so, all the **Local Joint Restoration Plans** or **Distribution Restoration Zone Plans** 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.

(c) The lead operator will advise other relevant parties of the 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 party will then operate in accordance with the provisions of the **Restoration Plan**.

(d) Operation of the **Restoration Plan** shall be terminated by the lead operator either when:

i.) the **Restoration Plan** has been successfully implemented and the resulting **Power Island** has been synchronised to another **Power Island** following instruction from **The Company**. In this case, the arrangements for synchronising the **Power Island** to the **System** will be set out in the **Restoration Plan**; or

ii.) the **Restoration Plan** has not been / is not being successfully implemented. In this circumstance, provided for in OC9.4.7.6.3(a), if an agreement is not reached on whether or not to apply the remainder of the plan or if **The Company**, in coordination with the other parties, confirms that it does not wish the remainder of the **Restoration Plan** to apply, the **Restoration Plan** shall be terminated. In this case **The Company** and the **Network Operator** in conjunction with the **Restoration Contractors** 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.

OC9.4.7.7 Local Joint Restoration Plan Operation

Following a **Total Shutdown** or **Partial Shutdown** the following shall apply:

OC9.4.7.7.1 Where **The Company**, as part of **System Restoration**, has given an instruction to a **Restoration Contractor** to initiate **Start-Up**, the relevant **Restoration Contractor** will prepare to **Start-Up** their **Plant** in accordance with the **Local Joint Restoration Plan**.

OC9.4.7.7.2 **The Company** will advise the relevant **Network Operator** of the requirement to switch its **User System** so as to segregate its **Demand** and to carry out such other actions as set out in the **Local Joint Restoration Plan**. The relevant **Network Operator** will then operate in accordance with the provisions of the **Local Joint Restoration Plan**.

OC9.4.7.7.3 **The Company**, in coordination with **Relevant Transmission Licensees**, will ensure that switching carried out on the **National Electricity Transmission System** and other actions are as set out in the **Local Joint Restoration Plan**.

OC9.4.7.7.4 Following notification from the **Anchor Restoration Contractor** that their **Anchor Plant** is ready to accept load and, where provided for in the **Local Joint Restoration Plan**, **Top Up Restoration Contractors** are in a position to subsequently synchronise to the **Total System** as soon as external site supplies are restored, **The Company** will instruct the **Anchor Restoration Contractor** (as provided for in OC9.4.5.2.2) to energise part of the **Total System**. The **Anchor Restoration Contractor** and the relevant **Network Operator** will then, in accordance with the requirements of the **Local Joint Restoration Plan**, establish communication and agree the output of the relevant **Anchor Plant** and the connection of **Demand** so as to establish a **Power Island**. As part of establishing a **Power Island**, **The Company** may instruct one or more **Top Up Restoration Contractors** to subsequently synchronise their **Plant** and **Apparatus** to the **System** to facilitate supplying more **Demand** in the **Power Island** in accordance with the requirements of the **Local Joint Restoration Plan**. During this period, **Restoration Contractors** will be required to regulate the output of their relevant **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**. The **Restoration Contractor's 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 **Local Joint Restoration Plan**.

OC9.4.7.7.5 Operation in accordance with the **Local Joint Restoration Plan** will be terminated by **The Company** or **SPT** and/or **SHETL** in Scotland (by notifying the **Network Operator** and relevant **Restoration Contractors**) immediately after successfully connecting the **Power Island** to another **Power Island**, or to the **User System** of another **Network Operator**, or to the synchronising of **Gensets** at other **Power Stations** (which are not owned and operated by **Restoration Contractors**) or **HVDC Systems** or **DC Converter Stations**. Operation in accordance with the **Local Joint Restoration Plan** will also terminate in the circumstances provided for in OC9.4.7.6.3(d) if an agreement is not reached or if **The Company** states that it does not wish the remainder of the **Local Joint Restoration Plan** to apply. **Users** will then comply with the **Bid-Offer Acceptances** or **Emergency Instructions** of **The Company**.

OC9.4.7.8 Distribution Restoration Zone Operation

Following a **Total** or **Partial Shutdown** the following shall apply:

OC9.4.7.8.1 Where **The Company** wishes a **Network Operator** to activate a **Distribution Restoration Zone Plan**, **The Company** will issue an **Emergency Instruction** to that **Network Operator** for it to activate the relevant **Distribution Restoration Zone Plan** whilst also informing the **Relevant Transmission Licensee**. In Scotland the instruction to a Scottish **Network Operator** to activate a Scottish **Distribution Restoration Zone Plan** would be given by **SPT** and/or **SHETL** as relevant. For the avoidance of doubt, **The Company** will issue instructions to initiate **System Restoration** in Scotland via STCP 06-1 which includes arrangements for the activation of Scottish **Distribution Restoration Zone Plans**.

OC9.4.7.8.2 Upon receipt of an **Emergency Instruction** from **The Company** (or instruction from **SPT** and/or **SHETL** as relevant), the **Network Operator** will confirm and acknowledge receipt in accordance with the requirements of BC2.9.2 and activate a **Distribution Restoration Zone Plan** as provided for in OC9.4.7.6.1(b). All instructions to relevant **Restoration Contractors** party to the **Distribution Restoration Zone Plan** will be issued by the **Network Operator**.

OC9.4.7.8.3 The operation of the **Distribution Restoration Zone** will then continue in accordance with the **Distribution Restoration Zone Plan** until it is terminated in accordance with the requirements of OC9.4.7.6.3(d).

OC9.4.7.8.4 Where **The Company** issues an **Emergency Instruction** (or in Scotland where **SPT** and/or **SHETL** as relevant issues an instruction) to a **Network Operator** to activate a **Distribution Restoration Zone Plan**, the **Network Operator** will first issue instructions to the **Restoration Contractor** (as provided for in OC9.4.5.1.1) informing them of the requirement to prepare their **Anchor Plant** to re-energise a **Distribution Restoration Zone** (or part thereof) and will (if applicable) then consequently issue instructions to **Restoration Contractors** in respect of their **Top Up Restoration Plant** informing them of the requirement to prepare their **Top Up Restoration Plant** accordance with the **Distribution Restoration Zone Plan**. The **Network Operator** shall also liaise with the **Relevant Transmission Licensee** where they are party to the **Distribution Restoration Zone Plan** to ensure switching can take place in the appropriate timescales. The **Network Operator** in liaison with the **Restoration Contractor(s)** will discuss when their **Anchor Plant** and **Top Up Plant** are expected to be available. For the avoidance of doubt, the **Anchor Restoration Contractor** shall not start to re-energise the **Distribution Restoration Zone** until instructed by the **Network Operator** in accordance with OC9.4.7.8.10 and this instruction shall only be given once the **Network Operator** has configured its **System** and taken the necessary additional actions to prepare the **Distribution Restoration Zone** to be re-energised. This may include any automatic switching that takes place through the action of any **Distribution Restoration Zone Control System**. It is only then, that once external site supplies have been restored, and as appliable to the **Distribution Restoration Zone Plan**, that **Network Operators** will give instructions (by manual or automatic means) to **Restoration Contractors** in respect of **Top Up Restoration Plant** to synchronise to the **Network Operator's System** in accordance with OC9.4.7.8.10.

OC9.4.7.8.5 All relevant **Restoration Contractors** and where applicable **Relevant Transmission Licensees** will inform the **Network Operator** of the indicative time when their **Plant** and **Apparatus** will be ready to energise or synchronise to the **Distribution Restoration Zone**.

OC9.4.7.8.6 The **Network Operator** shall inform **The Company** (and the **Relevant Scottish Transmission Licensee** in the case of a Scottish **Distribution Restoration Zone**) and **Transmission Licensees** where they are party to the **Distribution Restoration Zone Plan** advising that it has contacted the appropriate **Restoration Contractors** in accordance with the **Distribution Restoration Zone Plan** and the expected time when the **Anchor Generator** will energise the **Distribution Restoration Zone**.

OC9.4.7.8.7 In addition to the requirements of OC9.4.7.8.4 to OC9.4.7.8.6, and in accordance with the **Distribution Restoration Zone Plan**, the **Network Operator** shall start to reconfigure its **System** (by manual or automatic means) such that it is ready to enable the **Anchor Restoration Contractor** to re-energise the **Distribution Restoration Zone** (or part thereof), and where provided for in the **Distribution Restoration Zone Plan**, the subsequent synchronisation of **Top Up Restoration Plant**. To enable this process to take place, the **Network Operator** may need to change the topology and status of its **System** which may include but shall not be limited to changing the status of circuit breakers in addition to switching between pre agreed control system and **Protection** settings. Reconfiguration of the **Network Operator's System** prior to re-energisation of the **Distribution Restoration Zone**, may be achieved by instructions carried out manually, switching carried out remotely from the **Network Operators Control Centre** or via fully automatic means which could include a **Distribution Restoration Zone Control System**. Where a **Transmission Licensee** is party to the **Distribution Restoration Zone Plan**, the **Network Operator** shall liaise with the **Relevant Transmission Licensee** as part of this process to ensure that parts of the **Transmission System** can be energised from the **Distribution Restoration Zone**.

OC9.4.7.8.8 Once the **Network Operator** (and where necessary in accordance with the **Relevant Transmission Licensee**) has reconfigured its **System** and associated **Plant** and **Apparatus** (including but not limited to **Protection** and control system settings) it will contact the **Anchor Restoration Contractor** (be it by manual or automatic means) and agree a time for the **Anchor Plant** to re-energise the **Distribution Restoration Zone** (or part thereof). Where the **Anchor Restoration Contractor** or **Network Operator** needs to change the agreed proposed re-energisation time as a result of an unforeseen event such as, but not limited to, a faulty item of **Plant** or **Apparatus**, safety issue or unavailability of personnel, the **Anchor Restoration Contractor** and/or **Network Operator** will agree a revised re-energisation time. The **Anchor Restoration Contractor** and the relevant **Network Operator** will in accordance with the requirements of the **Distribution Restoration Zone Plan**, establish communication and agree the planned output of the relevant **Anchor Plant** and the connection of **Demand** to plan the formation of the **Power Island**.

OC9.4.7.8.9 The **Network Operator** will inform **The Company** (or relevant **Scottish Transmission Licensee** in the case of a Scottish **Distribution Restoration Zone**) or **Relevant Transmission Licensee** where they are party to the **Distribution Restoration Zone Plan** of the time when the **Anchor Restoration Contractor** is estimated to re-energise a section of the **Network Operator's System**. Should this estimated time vary, the **Network Operator** will inform **The Company** (or relevant **Scottish Transmission Licensee** in the case of a Scottish **Distribution Restoration Zone**) to state the revised estimated re-energisation time and the reason for the change.

OC9.4.7.8.10 The **Restoration Contractor** shall contact the **Network Operator** once their **Anchor Plant** is ready to re-energise the network. The **Network Operator** shall then assess their network status, the estimated re-energisation time as detailed in OC9.4.7.8.8 and if conditions are suitable, the **Network Operator** will issue an instruction to the **Anchor Restoration Contractor** (by manual or automatic means) to re-energise the **Distribution Restoration Zone** (or part thereof). Following the issue of instructions to the **Anchor Restoration Contractor**, and successful re-energisation of the **Distribution Restoration Zone** (or part thereof) the **Network Operator** will instruct (by manual or automatic means) **Top Up Restoration Contractors** party to the **Distribution Restoration Zone Plan** to synchronise to the **Distribution Restoration Zone**. The **Network Operator** shall also inform the **Relevant Transmission Licensee** when an instruction has been issued to the **Restoration Contractor** where they are party to the **Distribution Restoration Zone Plan**.

OC9.4.7.8.11 Once the **Distribution Restoration Zone** (or part thereof) has been re-energised and feeding some local **Demand** or controllable **Demand** provided by a relevant **Restoration Contractor**, they will be required to follow instructions from the **Network Operator** (by manual or automatic means) in accordance with the **Distribution Restoration Zone Plan**. The **Network Operator** and/or **Distribution Restoration Zone Control System** shall issue instructions to **Restoration Contractors** as necessary to ensure the **Distribution Restoration Zone** continues to run in a stable manner. As part of this process, the **Network Operator**, in coordination with **Restoration Contractors**, shall ensure risks to the **Network Operator's System** or the **Restoration Contractor's Plant**, that could arise through disturbances in the **Distribution Restoration Zone**, are minimised as far as reasonably practicable. This may be assisted through a planned series of re-energisation steps within the **Distribution Restoration Zone**, taking account of the capability and performance of the **Restoration Contractor's Plant** at that time.

OC9.4.7.8.12 **Demand** within the **Distribution Restoration Zone** can be restored by manual or remote controlled switching, or automatically by a **Distribution Restoration Zone Control System**. If during the **Demand** restoration process, any relevant **Restoration Contractor's Plant** or **Apparatus** cannot keep within its safe operating parameters, because of the nature of the **Demand** being supplied, the relevant **Restoration Contractor** shall inform the **Network Operator** without undue delay who in turn shall inform **The Company**. In the case of a **Distribution Restoration Zone** in Scotland, the Scottish **Network Operator** shall inform the relevant **Scottish Transmission Licensee**.

In order to help alleviate issues the **Network Operator** or **Distribution Restoration Zone Control System** will, where possible:

i. Instruct relevant **Restoration Contractors** to alter their **Demand**; or

**ii.** re-configure the topology of the **Distribution Restoration Zone**; or

iii. will instruct the relevant **Restoration Contractor** forming part of the **Distribution Restoration Zone** to re-configure its **System**.

**The Company** and **Network Operator** (and **Relevant Transmission Licensee** in Scotland) accepts that any decision to keep a relevant **Restoration Contractor's Plant** or **Apparatus** operating, if outside its safe operating parameters, is one for the **Restoration Contractor** concerned alone. **The Company**, the **Network Operator**, and the **Relevant Scottish Transmission Licensee** (for **Distribution Restoration Zones** in Scotland) accepts that the relevant **Restoration Contractor's Plant** and **Apparatus** may have its operating point changed by the relevant **Restoration Contractor** if it 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 Contractor** shall inform the **Network Operator** as soon as reasonably practical. A **Restoration Contractor** may also reject an instruction issued by a **Network Operator** but only on safety grounds (relating to personnel or plant) and this must be notified to **Network Operator** immediately.

OC9.4.7.8.13 To stabilise the voltage and **Frequency** of the **Network Operator's System** and increase the **Demand** supplied within the **Distribution Restoration Zone**, the **Network Operator** may need to instruct (by manual or automatic means) additional relevant **Restoration Contractors** to **Synchronise** their **Plant** to the **Distribution Restoration Zone** which would be part of the **Distribution Restoration Zone Plan**. The **Network Operator** and/or the **Distribution Restoration Zone Control System** shall ensure **Restoration Contractors** are able (where applicable) to contribute to voltage and **Frequency** control and ensure that adequate positive and negative headroom is maintained on **Restoration Contractor's Plant** and **Apparatus** to enable the management of **Power Island** contingences. For the avoidance of doubt, **The Company** may require **Transmission Licensees** in Scotland to manage the **Frequency** and voltage of **Power Islands** in Scotland as provided for in STCP 06-1 or **Network Operators** to manage the **Frequency** and voltage of **Distribution Restoration Zones** whilst recognising **The Company** has overall responsibility to the wider restoration process in the **GB Synchronous Area**.

OC9.4.7.8.14 As the **Distribution Restoration Zone** supports increasing **Demand**, and as implementation of the **Distribution Restoration Zone Plan** progresses, the **Network Operator** may need to switch between predefined control and **Protection** settings as the need arises.

OC9.4.7.8.15 Expansion of a **Distribution Restoration Zone** to an unenergised **Transmission** busbar and to wider parts of the unenergised **Transmission System** could be part of the **Distribution Restoration Zone Plan** in addition to the requirements of OC9.5.

OC9.4.7.8.16 Operation in accordance with the **Distribution Restoration Zone Plan** will be terminated by the **Network Operator** in accordance OC9.4.7.6.3(d).

OC9.4.7.9 Expansion of Power Islands

**The Company** will instruct relevant **Users** to expand **Power Islands** to achieve larger **Power Islands** following the successful termination of **Local Joint Restoration Plans** and **Distribution Restoration Zone Plans**.

OC9.4.7.10 Interconnection of Power Islands

**The Company** will subsequently interconnect the expanded **Power Islands** detailed in OC9.4.7.9 to form larger **Power Islands** which will then be connected to form an integrated system as detailed in OC9.5 which is a fundamental component of the **Electricity System Restoration Standard**. This should eventually achieve the re-establishment of the **Total System** or that part of the **Total System** subject to the **Partial Shutdown**, as the case may be. The interconnection of **Power Islands** will utilise the provisions of all or part of OC9.5 (**Re-Synchronisation** of **De-synchronised Power Islands**) and in such a situation such provisions will be part of the **System Restoration**.

Return the Total System Back to Normal Operation

OC9.4.7.11 **The Company** shall, as soon as reasonably practical, inform **Users** and the **BSCCo** when the **Total System** could return to normal operation. Any such determination by **The Company** does not mean that the provisions of Section G paragraph 3 (**System Restoration**) of the **BSC** shall cease to apply.

In making the determination that the **Total System** could return to normal operation, **The Company**, would consider, amongst other things, the following areas:

(a) the extent to which the **National Electricity Transmission System** is contiguous and energised;

(b) the integrity and stability of the **National Electricity Transmission System** and its ability to operate in accordance with the **Licence Standards**;

(c) the impact that returning to normal may have on transmission constraints and the corresponding ability to maximise the **Demand** connected; and

(d) the volume of generation, **Electricity Storage** or **Demand** not connected to the **National Electricity Transmission System**; and

(e) the functionality of normal communication systems (ie electronic data communication facilities, **Control Telephony**, etc).

In the event that the **Balancing Mechanism** has been suspended, it will not resume until the start of the **Settlement Period** determined by the **BSC Panel** in accordance with paragraph G3.1.2(d)(i) of the **BSC**.

For the avoidance of doubt, until resumption of the **Balancing Mechanism, The Company** is likely to continue to issue **Emergency Instructions** in accordance with BC2.9.

**Users** shall use reasonable endeavours to submit **Physical notifications** ten hours prior to the start of the **Settlement Period** determined by the **BSC Panel** in accordance with paragraph G3.1.2(d)(i) of the BSC and as notified by **The Company** to **Users**, in preparation for a return to normal operations.

In the event that the **Balancing Mechanism** has not been suspended and **The Company** has

determined that the **Total System** has returned to normal operation, **The Company** shall inform **Users** and the **BSCCo** as soon as possible of the time and date at which (in **The Company's** determination) the **Total System** returned to normal operation.

Conclusion of System Restoration

OC9.4.7.12 The provisions of this **OC9** shall cease to apply with effect from either:

(a) Where the **Balancing Mechanism** was suspended, the start of the **Settlement Period** that the **Balancing Mechanism** resumed normal operation, as determined by the **BSC Panel** and notified by the **BSCCo** in accordance with the provisions of the **BSC**; or

(b) Where the **Balancing Mechanism** was not suspended, the end of the **Settlement Period** determined and notified by the **BSCCo** (in accordance with the provisions of the **BSC**) and corresponding to the time and date that **The Company** determined that the **Total System** had returned to normal operation.

Externally Interconnected System Operators

OC9.4.7.13 Unless an **Interconnector** has an **Anchor Restoration Contract**, **The Company** will, pursuant to the **Interconnection Agreement** with **Externally Interconnected System Operators**, agree with **Externally Interconnected System Operators** when their transmission systems can be **Re-Synchronised**, if they have become separated.

## OC9.5 RE-SYNCHRONISATION OF POWER ISLANDS

The provisions in this OC9.5 do not apply to the parts of the **Total System** that normally operate **Out of Synchronism** with the rest of the **National Electricity Transmission System**.

Further requirements, including the provision of information, applying to **Re-synchronisation** of a **Power Island** following any **Total Shutdown** or **Partial Shutdown** are detailed in OC9.5.6.

OC9.5.1 (a) Where parts of the **Total System** are **Out of Synchronism** with each other (each such part being termed a **Power Island**), but where there has been no **Total Shutdown** or **Partial Shutdown**, **The Company** will instruct **Users** to regulate generation or **Demand**, as the case may be, to enable the **Power Islands** to be **Re-Synchronised** and **The Company** will inform those **Users** when **Re-Synchronisation** has taken place.

(b) As part of that process, there may be a need to deal specifically with **Embedded** generation or storage in those **Power Islands**. This OC9.5 provides for how such **Embedded** generation or storage should be dealt with. In Scotland, this OC9.5 also provides for how **Transmission** connected generation in **Power Islands** should be dealt with.

(c) In accordance with the provisions of the **BC**, **The Company** may decide that, to enable **Re-Synchronisation**, it will issue **Emergency Instructions** in accordance with BC2.9 and it may be necessary to depart from normal **Balancing Mechanism** operation in accordance with **BC2** in issuing **Bid-Offer Acceptances**.

(d) The provisions of this OC9.5 shall also apply during **System Restoration** to the **Re-Synchronising** of parts of the **System** following a **Total** or **Partial Shutdown**, as indicated in OC9.4. In such cases, the provisions of OC9.5 shall apply when the relevant **Restoration Plan(s)** referred to in OC9.4.7.6.3(d) are terminated.

OC9.5.2 Island loading and generation data management

Generation in those **Power Islands** may be dealt with as described in OC.9.5.2.1 and OC9.5.2.2. The method deployed will vary in relation to any particular incident:-

OC9.5.2.1 Data Submission between Generators and Network Operators via The Company

(a) In this section, OC9.5.2.1, relevant loading and other operational parameters are exchanged indirectly between **Generators** and/or **HVDC System Owners** and **DC Converter Station Owners** and **Network Operators** via **The Company**.

(b) **The Company**, each **Generator**, **HVDC Owner** and/or **DC Converter Station** owner with **Synchronised** (or connected and available to generate although not **Synchronised**) **Genset(s)** in the **Power Island** and the **Network Operator** whose **User System** forms all or part of the **Power Island** shall exchange information as set out in this OC9.5.2.1 to enable **The Company** to issue a **Bid-Offer Acceptance** or an **Emergency Instruction** to that **Generator** and/or **HVDC System Owner** and/or **DC Converter Station Owner** in relation to its **Genset(s)** in the **Power Island** until **Re-Synchronisation** takes place, on the basis that it will (where practicable) seek to maintain the **Target Frequency**.

(c) The information to **The Company** from the **Generator** and/or **HVDC System Owner** and/or **DC Converter Station** owner will cover its relevant operational parameters as outlined in the **Balancing Codes** (**BC**) and from **The Company** to the **Generator** and/or **HVDC System Owner** and/or **DC Converter Station** owner will cover data on **Demand** and changes in **Demand** in the **Power Island**.

(d) The information from the **Network Operator** to **The Company** will comprise data on **Demand** in the **Power Island**, including data on any constraints within the **Power Island**.

(e) **The Company** will keep the **Network Operator** informed of the **Bid-Offer Acceptances** or **Emergency Instructions** it is issuing to **Embedded Genset(s)** within the **Network Operator's User System** forming part of the **Power Island**.

OC9.5.2.2 Direct Data Submission between Generators, HVDC System Owners, DC Converter Station Owners and Network Operators

(a) In this section, OC9.5.2.2, relevant loading and other operational parameters are exchanged directly between **Generators**, and/or **HVDC System Owners** and **DC Converter Station Owners** and **Network Operators**.

(b) **The Company** will issue an **Emergency Instruction** and/or a **Bid-Offer Acceptance**, to the **Generator** and/or **HVDC System Owner** and/or **DC Converter Station Owner** to "float" local **Demand** and maintain **Frequency** at **Target Frequency**. In this situation, the **Generator** and/or **HVDC System Owner** and/or **DC Converter Station** owner will be required to regulate the output of its **Genset(s)** at the **Power Station** in question to the **Demand** prevailing in the **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**.

(c) The **Network Operator** is required to be in contact with the **Generator** and/or **HVDC System Operator** and/or **DC Converter Station** owner so that the **Network Operator** can supply data to the **Generator** and/or **HVDC System Owner** and/or **DC Converter Station** owner on **Demand** changes within the **Power Island**.

(d) If more than one **Generating Unit** and/or **HVDC System** and**/**or **DC Converter** is **Synchronised** to the **Power Island**, or is connected to the **Power Island** and available to generate although not **Synchronised**, the **Network Operator** will need to liaise with **The Company** to agree which **Generating Units** and/or **HVDC Systems** and/or **DC Converter** stations will be utilised to accommodate changes in **Demand** in the **Power Island**. The **Network Operator** will then maintain contact with the relevant **Generator**(s) and/or **HVDC System Owner(s)** and/or **DC Converter Station Owner**(s) in relation to that **Plant**.

(e) The **Generator** at the **Power Station** and/or **HVDC System Owner** and/or **DC Converter Station** owner must contact the **Network Operator** if the level of **Demand** which it has been asked to meet as a result of the **Emergency Instruction** and/or **Bid-Offer Acceptance** to "float" and the detail on **Demand** passed on by the **Network Operator**, is likely to cause problems for safety reasons (whether relating to personnel or **Plant** and/or **Apparatus**) in the operation of its **Generating Unit(s)** or **HVDC System(s)** or **DC Converter Station(s)**, in order that the **Network Operator** can alter the level of **Demand** which that **Generator** and/or **HVDC System Owner** and/or **DC Converter Station** owner needs to meet. Any decision to operate outside any relevant parameters is one entirely for the **Generator** and/or **HVDC System Owner** and/or **DC Converter Station** owner.

OC9.5.2.3 Control Features

(a) A system may be established in relation to a part of the **National Electricity Transmission System** and a **Network Operator's User System**, if agreed between **The Company** and the **Network Operator** and any relevant **Generator(s)**, **HVDC System Owner** or **DC Converter Station** owner, whereby upon a defined fault(s) occurring, manual or automatic control features will operate to protect the **National Electricity Transmission System** and relevant **Network Operator's User System** and **Generator(s)**, **HVDC System Owner(s)** or **DC Converter Station Owner(s) Plant** and simplify the restoration of **Demand** in the **Power Island**.

(b) In agreeing the establishment of such a system of control features, **The Company** will need to consider its impact on the operation of the **National Electricity Transmission System**.

(c) **The Company** will work with **Network Operators** involved in the wider **System Restoration** process to help balance generation and **Demand**, and help ensure that it does not have a destabilising effect on the **Total System**.

OC9.5.2.4 Absence of Control Features System

If a system of control features under OC9.5.2.3 has not been agreed as part of an **OC9 De-Synchronised Island Procedure** under OC9.5.4 below, **The Company** may choose to utilise the procedures set out in OC9.5.2.1 or OC9.5.2.2, or may instruct the **Generators** or **HVDC System Owner** or **DC Converter Station** owners (or some of them in respect of the **Plant** they own or operate) in the **Power Island** to **De-Synchronise**.

OC9.5.3 Choice of Option

In relation to each of the methods set out in OC9.5.2, where a **Power Island** has come into existence and where an **OC9 De-Synchronised Island Procedure** under OC9.5.4 has been agreed, **The Company**, the **Network Operator** and the relevant **Generator(s)**, **HVDC System Owners** or **DC Converter Station** owners will operate in accordance with that **OC9 De-Synchronised Island Procedure** unless **The Company** considers that the nature of the **De-Synchronised Island** situation is such that either:-

(i) the **OC9 De-Synchronised Island Procedure** does not cover the situation; or

(ii) the provisions of the **OC9 De-Synchronised Island Procedure** are not appropriate,

in which case **The Company** will instruct the relevant **Users** and the **Users** will comply with **The Company's** instructions (which in the case of **Generators** and/or **HVDC System Owners** and/or **DC Converter Station** owners will relate to **Active Power** supplied to the **Power Island** and in the case of **Network Operators** will relate to **Demand**).

OC9.5.4 Agreeing Procedures

In relation to each relevant part of the **Total System**, **The Company**, the **Network Operator** and the relevant **Generator** and/or **HVDC System Owner** and/or **DC Converter Station** owner will discuss and may agree a local procedure (an "**OC9 De-Synchronised Island Procedure**").

Where the need for an **OC9 De-Synchronised Island Procedure** arises for the first time, the following provisions shall apply:

(a) **The Company**, the **Network Operator(s)** and the relevant **Generator(s)** and/or **HVDC System Owners** or **DC Converter Station** owners will discuss the need for, and the detail of, the **OC9 De-Synchronised Island Procedure**. As soon as the need for an **OC9 De-Synchronised Island Procedure** is identified by **The Company** or a **User**, and the party which identifies such a need will notify all affected **Users** (and **The Company**, if that party is a **User**), and **The Company** will initiate these discussions.

(b) Each **OC9 De-Synchronised Island Procedure** will be in relation to a specific **Grid Supply Point**, but if there is more than one **Grid Supply Point** involved, then the **OC9 De-Synchronised Island Procedure** may cover all relevant **Grid Supply Points**. In Scotland, the **OC9 De-Synchronised Island Procedure** may also cover parts of the **National Electricity Transmission System** connected to the **User's System(s)** and **Power Stations** and **HVDC Systems** and **DC Converter Station** owners directly connected to the **National Electricity Transmission System** which are also likely to form part of the **Power Island**.

(c) The **OC9 De-Synchronised Island Procedure** will:

(i) record which **Users** and which **User Sites** are covered by the **OC9 De-Synchronised Island Procedure**;

(ii) record which of the methods set out in OC9.5 shall apply, with any conditions as to applicability being set out as well;

(iii) set out what is required from **The Company** and each **User** should a **Power Island** arise;

(iv) set out what action should be taken if the **OC9 De-Synchronised Island Procedure** does not cover a particular set of circumstances and will reflect that in the absence of any specified action, the provisions of OC9.5.3 will apply;

(v) in respect of **Scottish Transmission Systems**, the **OC9 De-Synchronised Island** procedure may be produced with and include obligations on the **Relevant Scottish Transmission Licensee(s)**; and

(vi) in respect of **Scottish Transmission Systems**, where the **OC9 De-Synchronised Island Procedure** includes the establishment of a **Power Island**, describe the route for establishment of the **Power Island**.

(d) Each **OC9 De-Synchronised Island Procedure** shall be prepared by **The Company** to reflect the above discussions.

(e) Each page of the **OC9 De-Synchronised Island Procedure** shall bear a date of issue and the issue number.

(f) When an **OC9 De-Synchronised Island Procedure** is prepared, it shall be sent by **The Company** to the **Users** involved for confirmation of its accuracy.

(g) The **OC9 De-Synchronised Island Procedure** shall then be signed on behalf of **The Company** and on behalf of each relevant **User** by way of written confirmation of its accuracy.

(h) Once agreed under this OC9.5.4, the procedure will become an **OC9 De-Synchronised Island Procedure** under the **Grid Code** and (subject to any change pursuant to this OC9) will apply between **The Company**, **Relevant Transmission Licensee** and the relevant **Users** as if it were part of the **Grid Code**.

(i) Once signed, a copy will be distributed by **The Company** to each **User** which is a party accompanied by a note indicating the issue number and the date of implementation.

(j) **The Company** and **Users** must make the **OC9 De-Synchronised Island Procedure** readily available to the relevant operational staff.

(k) If a new **User** connects to the **Total System** and needs to be included with an existing **OC9 De-Synchronised Island Procedure**, **The Company** will initiate a discussion with that **User** and the **Users** which are parties to the relevant **OC9 De-Synchronised Island Procedure**. The principles applying to a new **OC9 De-Synchronised Island Procedure** under this OC9.5.4 shall apply to such discussions and to any consequent changes.

(l) If **The Company**, or any **User** which is a party to an **OC9 De-Synchronised Island Procedure**, becomes aware that a change is needed to that **OC9 De-Synchronised Island Procedure**, it shall (in the case of **The Company**) initiate a discussion between **The Company** and the relevant **Users** to seek to agree the relevant change. The principles applying to establishing a new **OC9 De-Synchronised Island Procedure** under this OC9.5.4 shall apply to such discussions and to any consequent changes. If a **User** becomes so aware, it shall contact **The Company** who will then initiate such discussions.

(m) If in relation to any discussions, agreement cannot be reached between **The Company** and the relevant **Users**, **The Company** will operate the **System** on the basis that it will discuss which of the methods set out in OC9.5.2.1 or OC9.5.2.2 would be most appropriate at the time, if practicable. The complexities and uncertainties of recovery from a **Power Island** means that **The Company** will decide, having discussed the situation with the relevant **Users** and taking into account the fact that the three methods may not cover the situation or be appropriate, the approach which is to be followed. **The Company** will instruct the relevant **Users** and the **Users** will comply with **The Company's** instructions as provided in OC9.5.3.

OC9.5.5 Where the **National Electricity Transmission System** is **Out of Synchronism** with the **Transmission System** of an **Externally Interconnected System Operator**, **The Company** will, pursuant to the **Interconnection Agreement** with that **Externally Interconnected System Operator**, agree with that **Externally Interconnected System Operator** when its **Transmission System** can be **Re-Synchronised** to the **National Electricity Transmission System**.

OC9.5.6 Further requirements regarding **Re-synchronisation** of **De-synchronised Islands** following any **Total Shutdown** or **Partial Shutdown**

Following any **Total Shutdown** or **Partial Shutdown**, **The Company** expects that it will be necessary to interconnect **Power Islands** utilising the provisions of OC9.5. The complexities and uncertainties of recovery from a **Total Shutdown** or **Partial Shutdown** requires the provisions of OC9.5 to be flexible, however, the strategies which **The Company** will, where practicable, be seeking to follow when **Re-synchronising Power Islands** following any **Total Shutdown** or **Partial Shutdown**, include the following:

(a) the provision of supplies to appropriate **Power Stations** to facilitate their synchronisation as soon as practicable;

(b) energisation of a skeletal **National Electricity Transmission System**;

(c) the strategic restoration of **Demand** in co-ordination with relevant **Network Operators**.

As highlighted in OC9.4.3, during a **Total Shutdown** or **Partial Shutdown** and during the subsequent recovery, which includes any period during which the procedures in this OC9.5 apply, the **Licence Standards** may not apply and the **Total System** may be operated outside normal voltage and **Frequency** standards.

OC9.5.7 To manage effectively and co-ordinate the restoration strategies of the **Total System** (any **Re-Synchronisation** of **Power Islands**) following any **Total Shutdown** or **Partial Shutdown**, requires **The Company** and relevant **Users** to undertake certain planning activities as set out below:

(a) **The Company** and **Network Operators** shall review on a regular basis the processes by which each **Power Island** will be interconnected. This is likely to cover an exchange of information regarding the typical size, location and timing requirements for **Demand** to be reconnected and also include details (ability to change/disable) of the low frequency trip relay settings of the **Demand** identified.

(b) Each **Generator** shall provide to **The Company** information to assist **The Company** in the formulation of the restoration strategies of **Power Island** expansion. This information shall be provided in accordance with PC.A.5.7.

OC9.6 JOINT SYSTEM INCIDENT PROCEDURE

OC9.6.1 A "**Joint System Incident**" is

(a) an **Event**, wherever occurring (other than on an **Embedded Small Power Station** or **Embedded Medium Power Station**), which, in the opinion of **The Company** or a **User**, has or may have a serious and/or widespread effect.

(b) In the case of an **Event** on a **User(s) System(s)** (other than on an **Embedded Small Power Station** or **Embedded Medium Power Station**), the effect must be on the **National Electricity Transmission System**, and in the case of an **Event** on the **National Electricity Transmission System**, the effect must be on a **User(s) System(s)** (other than on an **Embedded Small Power Station** or **Embedded Medium Power Station**).

Where an **Event** on a **User(s) System(s)** has or may have no effect on the **National Electricity Transmission System**, then such an **Event** does not fall within **OC9** and accordingly **OC9** shall not apply to it.

OC9.6.2 (a) (i) Each **User** (other than **Generators** which only have **Embedded Small Power Stations** and/or **Embedded Medium Power Stations**) will provide in writing to **The Company**, and

(ii) **The Company** will provide in writing to each **User** (other than **Generators** which only have **Embedded Small Power Stations** and/or **Embedded Medium Power Stations**), a telephone number or numbers at which, or through which, senior management representatives nominated for this purpose and who are fully authorised to make binding decisions on behalf of **The Company** or the relevant **User**, as the case may be, can be contacted day or night when there is a **Joint System Incident**.

(b) The lists of telephone numbers will be provided in accordance with the timing requirements of the **Bilateral Agreement** and/or **Construction Agreement** with that **User**, prior to the time that a **User** connects to the **National Electricity Transmission System** and must be up-dated (in writing) as often as the information contained in them changes.

OC9.6.3 Following notification of an **Event** under **OC7**, **The Company** or a **User**, as the case may be, will, if it considers necessary, telephone the **User** or **The Company**, as the case may be, on the telephone number referred to in OC9.6.2, to obtain such additional information as it requires.

OC9.6.4 Following notification of an **Event** under **OC7**, and/or the receipt of any additional information requested pursuant to OC9.6.3, **The Company** or a **User**, as the case may be, will determine whether or not the **Event** is a **Joint System Incident**, and, if so, **The Company** and/or the **User** may set up an **Incident Centre** in order to avoid overloading the existing, operational/control arrangements be they **The Company's** or **User's**.

OC9.6.5 Where **The Company** has determined that an **Event** is a **Joint System Incident**, **The Company** shall, as soon as possible, notify all relevant **Users** that a **Joint System Incident** has occurred and, if appropriate, that it has established an **Incident Centre** and the telephone number(s) of its **Incident Centre** if different from those already supplied pursuant to OC9.6.2.

OC9.6.6 If a **User** establishes an **Incident Centre** it shall, as soon as possible, notify **The Company** that it has been established and the telephone number(s) of the **Incident Centre** if different from those already supplied pursuant to OC9.6.2.

OC9.6.7 **The Company's Incident Centre** and/or the **User's Incident Centre** will not assume any responsibility for the operation of the **National Electricity Transmission System** or **User's System**, as the case may be, but will be the focal point in **The Company** or the **User**, as the case may be, for:

(a) the communication and dissemination of information between **The Company** and the senior management representatives of **User(s)**; or

(b) between the **User** and the senior management representatives of **The Company**, as the case may be,

relating to the **Joint System Incident**. The term "**Incident Centre**" does not imply a specially built centre for dealing with **Joint System Incidents**, but is a communications focal point. During a **Joint System Incident**, the normal communication channels, for operational/control communication between **The Company** and **Users** will continue to be used.

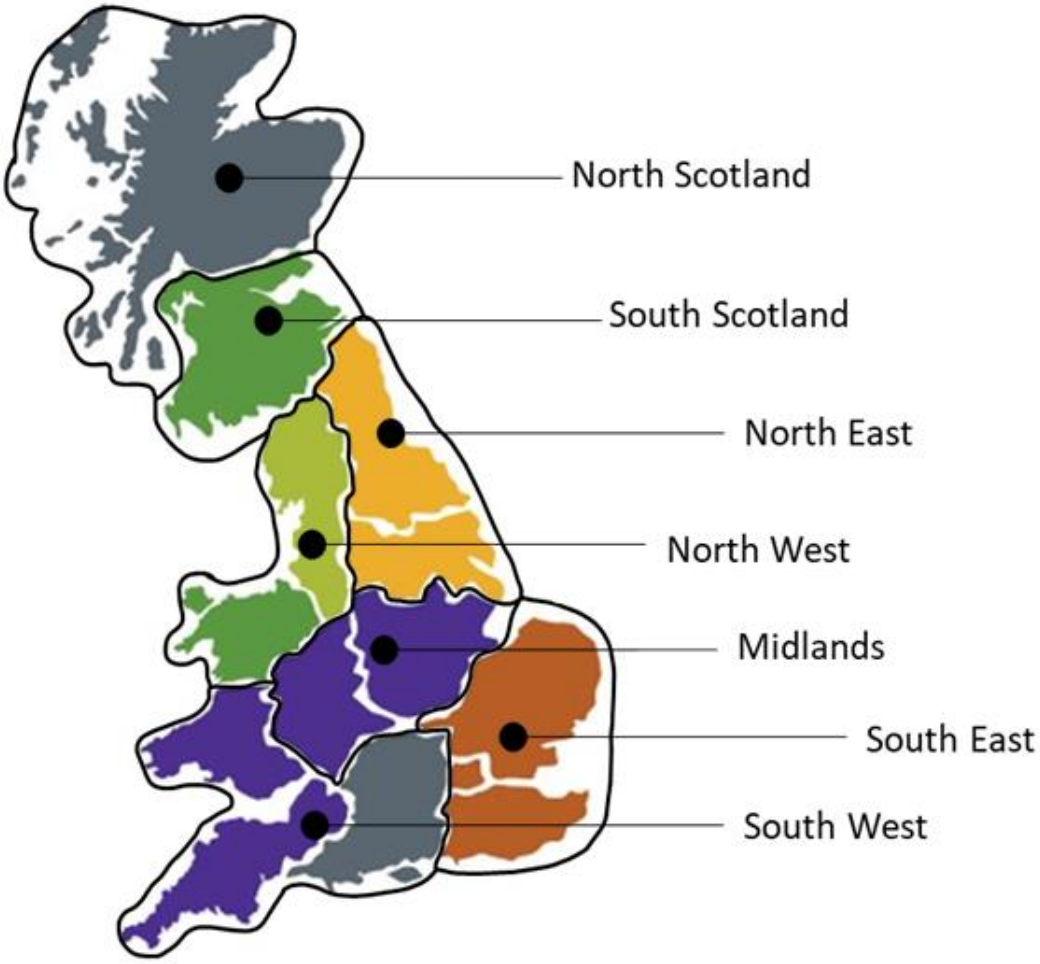
OC9.6.8 All communications between the senior management representatives of the relevant parties with regard to **The Company's** role in the **Joint System Incident** shall be made via **The Company's Incident Centre** if it has been established.

OC9.6.9 All communications between the senior management representatives of **The Company** and a **User** with regard to that **User's** role in the **Joint System Incident** shall be made via that **User's Incident Centre** if it has been established.

OC9.6.10 **The Company** will decide when conditions no longer justify the need to use its **Incident Centre** and will inform all relevant **Users** of this decision.

OC9.6.11 Each **User** which has established an **Incident Centre** will decide when conditions no longer justify the need to use that **Incident Centre** and will inform **The Company** of this decision.

**APPENDIX 1 – SYSTEM RESTORATION REGIONS**




**< END OF OPERATING CODE NO. 9 >**

# GENERAL CONDITIONS
**(GC)**

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GC.1 INTRODUCTION

GC.1.1 The **General Conditions** contain provisions which are of general application to all provisions of the Grid Code. Their objective is to ensure, to the extent possible, that the various sections of the Grid Code work together and work in practice for the benefit of all **Users**.

GC.2 SCOPE

GC.2.1 The **General Conditions** apply to all **Users** (including, for the avoidance of doubt, **The Company**).

GC.3 UNFORESEEN CIRCUMSTANCES

GC.3.1 If circumstances arise which the provisions of the Grid Code have not foreseen, **The Company** shall, to the extent reasonably practicable in the circumstances, consult promptly and in good faith all affected **Users** in an effort to reach agreement as to what should be done. If agreement between **The Company** and those **Users** as to what should be done cannot be reached in the time available, **The Company** shall determine what is to be done. Wherever **The Company** makes a determination, it shall do so having regard, wherever possible, to the views expressed by **Users** and, in any event, to what is reasonable in all the circumstances. Each **User** shall comply with all instructions given to it by **The Company** following such a determination provided that the instructions are consistent with the then current technical parameters of the particular **User's System** registered under the Grid Code. **The Company** shall promptly refer all such unforeseen circumstances and any such determination to the **Panel** for consideration in accordance with GC.4.2(e).

GC.4 NOT USED

GC.5 COMMUNICATION BETWEEN THE COMPANY AND USERS

GC.5.1 Unless otherwise specified in the Grid Code, all instructions given by **The Company** and communications (other than relating to the submission of data and notices) between **The Company** and **Users** (other than **Generators**, **DC Converter Station** owners or **Suppliers**) shall take place between the **The Company Control Engineer** based at the **Transmission Control Centre** notified by **The Company** to each **User** prior to connection, and the relevant **User Responsible Engineer/Operator**, who, in the case of a **Network Operator**, will be based at the **Control Centre** notified by the **Network Operator** to **The Company** prior to connection.

GC.5.2 Unless otherwise specified in the Grid Code, all instructions given by **The Company** and communications (other than relating to the submission of data and notices) between **The Company** and **Generators** and/or **DC Converter Station** owners and/or **Suppliers**, shall take place between the **The Company Control Engineer** based at the **Transmission Control Centre** notified by **The Company** to each **Generator** or **DC Converter Station** owner prior to connection, or to each **Supplier** prior to submission of **BM Unit Data**, and either the relevant **Generator's** or **DC Converter Station** owner's or **Supplier's Trading Point** (if it has established one) notified to **The Company** or the **Control Point** of the **Supplier** or the **Generator's Power Station** or **DC Converter Station**, as specified in each relevant section of the Grid Code. In the absence of notification to the contrary, the **Control Point** of a **Generator's Power Station** will be deemed to be the **Power Station** at which the **Generating Units** or **Power Park Modules** are situated.

GC.5.3 Unless otherwise specified in the Grid Code, all instructions given by **The Company** and communications (other than relating to the submission of data and notices) between **The Company** and **Users** will be given by means of the **Control Telephony** referred to in CC.6.5.2.

GC.5.4 If the **Transmission Control Centre** notified by **The Company** to each **User** prior to connection, or the **User Control Centre**, notified in the case of a **Network Operator** to **The Company** prior to connection, is moved to another location, whether due to an emergency or for any other reason, **The Company** shall notify the relevant **User** or the **User** shall notify **The Company**, as the case may be, of the new location and any changes to the **Control Telephony** or **System Telephony** necessitated by such move, as soon as practicable following the move.

GC.5.5 If any **Trading Point** notified to **The Company** by a **Generator** or **DC Converter Station** owner prior to connection, or by a **Supplier** prior to submission of **BM Unit Data**, is moved to another location or is shut down, the **Generator**, **DC Converter Station** owner or **Supplier** shall immediately notify **The Company**.

GC.5.6 The recording (by whatever means) of instructions or communications given by means of **Control Telephony** or **System Telephony** will be accepted by **The Company** and **Users** as evidence of those instructions or communications.

## GC.6 MISCELLANEOUS

### GC.6.1 Data and Notices

GC.6.1.1 Data and notices to be submitted either to **The Company** or to **Users** under the Grid Code (other than data which is the subject of a specific requirement of the Grid Code as to the manner of its delivery) shall be delivered in writing either by hand or sent by first-class pre-paid post, or by electronic mail to a specified address or addresses previously supplied by **The Company** or the **User** (as the case may be) for the purposes of submitting that data or those notices.

GC.6.1.2 References in the Grid Code to "in writing" or "written" include typewriting, printing, lithography, and other modes of reproducing words in a legible and non-transitory form and in relation to submission of data and notices includes electronic communications.

GC.6.1.3 Data delivered pursuant to paragraph GC.6.1.1, in the case of data being submitted to **The Company**, shall be addressed to the **Transmission Control Centre** at the address notified by **The Company** to each **User** prior to connection, or to such other Department within **The Company** or address, as **The Company** may notify each **User** from time to time, and in the case of notices to be submitted to **Users**, shall be addressed to the chief executive of the addressee (or such other person as may be notified by the **User** in writing to **The Company** from time to time) at its address(es) notified by each **User** to **The Company** in writing from time to time for the submission of data and service of notices under the Grid Code (or failing which to the registered or principal office of the addressee).

GC.6.1.4 All data items, where applicable, will be referenced to nominal voltage and **Frequency** unless otherwise stated.

## GC.7 OWNERSHIP OF PLANT AND/OR APPARATUS

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

## GC.8 SYSTEM CONTROL

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

GC.9 EMERGENCY SITUATIONS

**Users** should note that the provisions of the Grid Code may be suspended, in whole or in part, during a Security Period, as more particularly provided in the **Fuel Security Code**, or pursuant to any directions given and/or orders made by the **Secretary of State** under section 96 of the **Act** or under the Energy Act 1976.

GC.10 MATTERS TO BE AGREED

Save where expressly stated in the Grid Code to the contrary where any matter is left to **The Company** and **Users** to agree and there is a failure so to agree the matter shall not without the consent of both **The Company** and **Users** be referred to arbitration pursuant to the rules of the **London Court of International Arbitration**.

GC.11 GOVERNANCE OF ELECTRICAL STANDARDS

GC.11.1 In relation to the **Electrical Standards** the following provisions shall apply.

GC.11.2 (a) If a **User**, or in respect of the **Electrical Standards** in (b) to the annex, **The Company**, or in respect of the **Electrical Standards** in (a) to the annex, or in respect of the **Electrical Standards** in (c) or (d) to the annex, the **Relevant Scottish Transmission Licensee**, wishes to:-

(i) raise a change to an **Electrical Standard**;

(ii) add a new standard to the list of **Electrical Standards**;

(iii) delete a standard from being an **Electrical Standard**,

it shall activate the **Electrical Standards** procedure.

(b) The **Electrical Standards** procedure is the notification to the secretary to the **Panel** of the wish to so change, add or delete an **Electrical Standard**. That notification must contain details of the proposal, including an explanation of why the proposal is being made.

GC.11.3 Ordinary Electrical Standards Procedure

(a) Unless it is identified as an urgent **Electrical Standards** proposal (in which case GC.11.4 applies) or unless the notifier requests that it be tabled at the next **Panel** meeting, as soon as reasonably practicable following receipt of the notification, the **Panel** secretary shall forward the proposal, with a covering paper, to **Panel Members**.

(b) If no objections are raised within 20 Business Days of the date of the proposal, then it shall be deemed approved pursuant to the **Electrical Standards** procedure, and **The Company** shall make the change to the relevant **Electrical Standard** or the list of **Electrical Standards** contained in the Annex to this GC.11.

(c) If there is an objection (or if the notifier had requested that it be tabled at the next **Panel** meeting rather than being dealt with in writing), then the proposal will be included in the agenda for the next following **Panel** meeting.

(d) If there is broad consensus at the **Panel** meeting in favour of the proposal, **The Company** will make the change to the **Electrical Standard** or the list of **Electrical Standards** contained in the Annex to this GC.11.

(e) If there is no such broad consensus, including where the **Panel** believes that further consultation is needed, **The Company** will establish a **Panel** working group if this was thought appropriate and in any event **The Company** shall undertake a consultation of **Authorised Electricity Operators** liable to be materially affected by the proposal.

(f) Following such consultation, **The Company** will report back to **Panel Members**, either in writing or at a **Panel** meeting. If there was broad consensus in the consultation, then **The Company** will make the change to the **Electrical Standard** or the list of **Electrical Standards** contained in the Annex to this GC.11.

(g) Where following such consultation there is no broad consensus, the matter will be referred to the **Authority** who will decide whether the proposal should be implemented and will notify **The Company** of its decision. If the decision is to so implement the change, **The Company** will make the change to the **Electrical Standard** or the list of **Electrical Standards** contained in the Annex to this GC.11.

(h) In all cases where a change is made to the list of **Electrical Standards**, **The Company** will publish and circulate a replacement page for the Annex to this GC covering that list and reflecting the change.

GC.11.4 Urgent Electrical Standards Procedure

(a) If the notification is marked as an urgent **Electrical Standards** proposal, the **Panel** secretary will contact **Panel Members** in writing to see whether a majority who are contactable agree that it is urgent and in that notification the secretary shall propose a timetable and procedure which shall be followed.

(b) If such members do so agree, then the secretary will initiate the procedure accordingly, having first obtained the approval of the **Authority**.

(c) If such members do not so agree, or if the **Authority** declines to approve the proposal being treated as an urgent one, the proposal will follow the ordinary **Electrical Standards** procedure as set out in GC.11.3 above.

(d) If a proposal is implemented using the urgent **Electrical Standards** procedure, **The Company** will contact all **Panel Members** after it is so implemented to check whether they wish to discuss further the implemented proposal to see whether an additional proposal should be considered to alter the implementation, such proposal following the ordinary **Electrical Standards** procedure.

GC.12 CONFIDENTIALITY

GC.12.1 **Users** should note that although the Grid Code contains in certain sections specific provisions which relate to confidentiality, the confidentiality provisions set out in the **CUSC** apply generally to information and other data supplied as a requirement of or otherwise under the Grid Code. To the extent required to facilitate the requirements of the **EMR Documents**, **Users** that are party to the Grid Code but are not party to the **CUSC Framework Agreement** agree that the confidentiality provisions of the **CUSC** are deemed to be imported into the Grid Code.

GC.12.2 **The Company** has obligations under the **STC** to inform **Relevant Transmission Licensees** of certain data. **The Company** may pass on **User** data to a **Relevant Transmission Licensee** where:

(a) **The Company** is required to do so under a provision of Schedule 3 of the **STC**; and/or

(b) permitted in accordance with PC.3.4, PC.3.5 and OC2.3.2.

GC.12.3 **The Company** has obligations under the **EMR Documents** to inform **EMR Administrative Parties** of certain data. **The Company** may pass on **User** data to an **EMR Administrative Party** where **The Company** is required to do so under an **EMR Document**.

GC.12.4 **The Company** may use **User** data for the purpose of carrying out its **EMR Functions**.

GC.13 RELEVANT TRANSMISSION LICENSEES

GC.13.1 It is recognised that the **Relevant Transmission Licensees** are not parties to the Grid Code. Accordingly, notwithstanding that Operating Code No. 8 Appendix 1 ("OC8A") and Appendix 2 ("OC8B"), OC7.6, OC9.4 and OC9.5 refer to obligations which will in practice be performed by the **Relevant Transmission Licensees** in accordance with relevant obligations under the **STC**, for the avoidance of doubt all contractual rights and obligations arising under OC8A, OC8B, OC7.6, OC9.4 and OC9.5 shall exist between **The Company** and the relevant **User** and in relation to any enforcement of those rights and obligations OC8A, OC8B, OC7.6, OC9.4 and OC9.5 shall be so read and construed. The **Relevant Transmission Licensees** shall enjoy no enforceable rights under OC8A, OC8B, OC7.6, OC9.4 and OC9.5 nor shall they be liable (other than pursuant to the **STC**) for failing to discharge any obligations under OC8A, OC8B, OC7.6, OC9.4 and OC9.5.

GC.13.2 For the avoidance of doubt nothing in this Grid Code confers on any **Relevant Transmission Licensee** any rights, powers or benefits for the purpose of the Contracts (Rights of Third Parties) Act 1999.

GC.14 BETTA TRANSITION ISSUES

GC.14.1 NOT USED.

GC.15 EMBEDDED EXEMPTABLE LARGE AND MEDIUM POWER STATIONS

GC.15.1 This GC.15.1 shall have an effect until and including 31st March 2007.

(i) CC.6.3.2, CC.6.3.7, CC.8.1 and BC3.5.1; and

(ii) Planning Code obligations and other Connection Conditions; shall apply to a **User** who owns or operates an **Embedded Exemptable Large Power Station**, or a **Network Operator** in respect of an **Embedded Exemptable Medium Power Station**, except where and to the extent that, in respect of that **Embedded Exemptable Large Power Station** or **Embedded Exemptable Medium Power Station**, **The Company** agrees or where the relevant **User** and **The Company** fail to agree, where and to the extent that the **Authority** consents.

GC.16 SYSTEM DEFENCE PLAN, SYSTEM RESTORATION AND TEST PLAN

GC.16.1 In relation to the **System Defence Plan**, **System Restoration Plan** and **Test Plan** the following provisions shall apply.

GC.16.2 If a **User** or **The Company**, wishes to raise a change to the **System Defence Plan**, **System Restoration Plan** or **Test Plan**, they shall notify the **Panel Secretary** of the proposed change to the **System Defence Plan**, **System Restoration Plan** or **Test Plan**.

In respect of the **System Defence Plan** the proposal shall not change the characteristics of the service to be provided or the conditions for aggregation, as any such changes that relate to the terms and conditions for **Defence Service Providers**; as set out in Article 4 paragraph 4 of **Assimilated Law** (Commission Regulation (EU) 2017/2196), as amended by Statutory Instrument 533 (2019); is subject to a separate change procedure. That notification must contain details of the proposal, including an explanation of why the proposal is being made.

In respect of the **System Restoration Plan**, the proposal shall not change the characteristics of the service to be provided or conditions for aggregation or the target geographical distribution of power sources with **System Restoration** and island operation capabilities, as any such changes that relate to the terms and conditions for **Restoration Service Providers**; as set out in Article 4 paragraph 4 of **Assimilated Law** (Commission Regulation (EU) 2017/2196), as amended by Statutory Instrument 533 (2019); is subject to a separate change procedure. . That notification must contain details of the proposal, including an explanation of why the proposal is being made.

In respect of the **Test Plan**, the proposal shall include an explanation of why the proposal is being made.

Any such change proposals shall take into account the legitimate expectations, where necessary, of **User's**, **Defence Service Providers** or **Restoration Service Providers** based on the initially specified or agreed requirements or methodologies.

GC.16.3 Ordinary Procedure

(a) Unless it is identified as an urgent proposal (in which case GC.16.4 applies) or unless the notifier requests that it be tabled at the next **Panel** meeting, as soon as reasonably practicable following receipt of the notification, the **Panel Secretary** shall forward the proposal, with a covering paper, to **Panel Members** and a consultation of not less than one month shall be undertaken.

(b) For the **System Defence Plan** and the **System Restoration Plan** if no objections are raised following the consultation, then the modification shall be deemed approved, and **The Company** shall make the change to the **System Defence Plan** or the **System Restoration Plan**, and the **Panel Secretary** shall as soon as reasonably possible, publish it on **The Company's Website** and inform **Users** and other persons who may be interested.

(c) If there is an objection (or if the notifier had requested that it be tabled at the next **Panel** meeting rather than being dealt with in writing), then the proposal to change the **System Defence Plan** or **System Restoration Plan** or **Test Plan** will be included on the agenda for the next **Panel** meeting.

(d) For the **System Defence Plan** and the **System Restoration Plan** if there is a majority consensus at the **Panel** meeting in favour of the proposal, **The Company** will make the change to the **System Defence Plan** or the **System Restoration Plan** as soon as reasonably possible and the **Panel Secretary** shall publish it on **The Company's Website** and inform **Users** and other persons who may be interested.

(e) If there is no such majority consensus in respect of the **System Defence Plan** or the **System Restoration Plan** or the **Test Plan**, **The Company** will request guidance from the **Panel** on an appropriate way forward**.** If the **Panel** decides a working group is required then the procedure under GR15 shall apply unless otherwise directed by **The Authority**.

(f) In the case of a modification to the **Test Plan**, it shall be submitted to **The Authority** for approval. If approved **The Company** will make the change to the **Test Plan** as soon as reasonably possible and the **Panel Secretary** shall publish it on **The Company's Website** and inform **Users** and other persons who may be interested.

GC.16.4 Urgent Procedure

(a) If the notification to change the **System Defence Plan** or **System Restoration Plan** or **Test Plan** is marked as an urgent proposal, the **Panel Secretary** will contact **Panel Members** in writing to see whether a majority who are contactable agree that it is urgent and in that case the **Panel Secretary** shall propose a timetable and procedure which shall be followed. The **Panel Secretary** shall as soon as reasonably possible, publish the proposal on **The Company's Website** and inform **User's** and other persons who may be interested.

(b) If such **Panel Members** do so agree, then the **Panel Secretary** will initiate the procedure accordingly, having first obtained the approval of **The Authority** that urgency is warranted in accordance with the criteria set out in **The Authority's** published guidance.

(c) If such **Panel Members** do not so agree, or if **The Authority** declines to approve the proposal being treated as an urgent one, the proposal will follow the ordinary procedure as set out in GC.16.3.

(d) If a proposal to change the **System Defence Plan** or **System Restoration Plan** is developed using the urgent procedure, **The Company** will contact all **Panel Members** after it is agreed as being urgent to check whether they wish to discuss further the proposal to see whether an additional proposal should be considered to alter the implementation, such proposal following the ordinary procedure as provided for in GC.16.3 or, if agreed by **The Authority**, urgency as provided for in GC16.4.

## GC.17 DIRECTIONS RELATED TO NATIONAL SECURITY

GC.17.1 The **Secretary of State** may issue a direction to **The Company** as referred to in condition B4 of the **ESO Licence** where in the opinion of the **Secretary of State** there is a risk relating to national security that may detrimentally impact the resilience, safety or security of the energy system, or the continuity of essential services, and it is in the interest of national security that a direction should be issued to **The Company.**

GC.17.2 **The Company** must comply with any such direction that has been issued by the **Secretary of State**. **Users** should note that **The Company** is not required to comply with any other obligation in the **ESO licence** where and to the extent that compliance with that obligation would be inconsistent with the requirement to comply with such a direction, for the period set out in the direction. This includes the requirement set out in condition E3 of **ESO licence** to comply with this **Grid Code**.

GC.17.3 **The Company** is required under condition B4 of its **ESO Licence** to inform the **Secretary of State** of any conflict with the obligations as identified in GC.17.2 as soon as reasonably practicable after the conflict is identified. **The Company** will include in such a notice, details of any identified impact or non-compliance that will be caused or will be likely to be caused to **Users,** and in such a case will also seek clarification of whether this can be shared with the affected **User**.

GC.17.4 Where reasonably practicable and subject to the agreement of the **Secretary of State** to share any such specific details, **The Company** will inform affected **Users** as identified in GC.17.3 of what actions **The Company** will take or has taken, or not taken, to comply with a direction or amended direction (including when such a direction is revoked) and what identified impact or non-compliance this will or is likely to cause to the **User**.

GC.17.5 **The Company's** obligations under this code shall be suspended without liability where and to the extent that compliance with any such obligation would be inconsistent with the requirement upon **The Company** to comply with a direction.

GC.17.6 **A User's** obligations under this code shall be suspended without liability where and to the extent that the **User** is unable to comply with any such obligation as a result of any action taken, or not taken, by **The Company** to comply with a direction.

GC.17.7 The **Secretary of State** may at any time amend or revoke any direction issued to **The Company** as referred to in condition B4 of the **ESO Licence**

## GC.18 ADVISORY AND INFORMATION REQUESTS

GC.18.1 **The Company** is required to provide advice, analysis or information to the **Authority** or to a **Minister of the Crown** when requested in accordance with section 171 of the **Energy Act 2023** and condition D1 of the **ESO Licence** and **GSP Licence**.

GC.18.2 **The Company** may by notice request from **Users** such information as it reasonably requires in connection with the exercise of any of its functions, in accordance with section 172 of the **Energy Act 2023**. It will do so by the issue of an **Information Request Notice**. The purposes of this may include to assist in the fulfilment of a request for advice, analysis or information as set out in GC.18.1.

GC.18.3 **The Company** is required by condition D2 of the **ESO Licence** and **GSP Licence** to prepare, submit for approval by the **Authority** and publish on its website once approved an **Information Request Statement** that sets out further detail on the process **The Company** expects to follow when requesting information from other parties.

The **Information Request Statement** must include, but need not be limited to, the following matters as set out in condition D2.5 of the **ESO Licence** and **GSP Licence**:

(a) the process **The Company** expects to follow when issuing an **Information Request Notice**, including any further detail around the expected engagement between **The Company** and recipient of an **Information Request Notice**; and

(b) the details to be included in an **Information Request Notice** issued by **The Company**.

GC.18.4 A **User** to whom a request is made under GC.18.2 must, so far as reasonably practicable, provide the requested information within such reasonable period, and in such reasonable form and manner, as may be specified in the **Information Request Notice**.

GC.18.5 **The Company** must, unless the **Authority** otherwise consents, maintain for a period of 6 years and provide to the **Authority** where required a record of information requests as detailed in condition D2.12 of the **ESO Licence** and **GSP Licence** including

(a) a copy of the **Information Request Notice**;

(b) any subsequent variations to the original information requested;

(c) the recipient's response to the notice, including any refusal or challenges to the notice or requested information;

(d) the time taken for the recipient to provide the requested information;

(e) the manner and form the information was provided in; and

(f) the information provided in response to the notice, and whether such information complied, in **The Company**'s view, with the **Information Request Notice**

# ANNEX TO THE GENERAL CONDITIONS

The **Electrical Standards** are as follows:

(a) **Electrical Standards** applicable for **NGET's Transmission System**

| **The Relevant Electrical Standards Document (RES)** | | Reference | Issue | Date |
|---|---|---|---|---|
| Parts 1 to 3 | | | 3.0 | March 2018 |
| Part 4 – Specific Requirements | | | | |
| 1 | Back-Up Protection Grading across NGET's and other Network Operator Interfaces | PS(T)044(RES) | 1.0 | September 2014 |
| 2 | Ratings and General Requirements for Plant, Equipment, Apparatus and Services for the National Grid System and Connections Points to it. | TS 1 (RES) | 1.0 | February 2018 |
| 3 | Substations | TS 2.01 (RES) | 1.0 | February 2018 |
| 4 | Switchgear | TS 2.02 (RES) | 1.0 | October 2014 |
| 5 | Substation Auxiliary Supplies | TS 2.12 (RES) | 1.0 | October 2014 |
| 6 | Ancillary Light Current Equipment | TS 2.19 (RES) | 1.0 | October 2014 |
| 7 | Substation Interlocking Schemes | TS 3.01.01 (RES) | 1.0 | February 2018 |
| 8 | Earthing Requirements | TS 3.01.02 (RES) | 1.0 | October 2014 |
| 9 | Circuit Breakers | TS 3.02.01 (RES) | 2.0 | February 2018 |
| 10 | Disconnectors and Earthing Switches | TS 3.02.02 (RES) | 1.0 | October 2014 |
| 11 | Current Transformers for Protection and General Use on the 132kV, 275kV and 400kV Systems | TS 3.02.04 (RES) | 1.0 | October 2014 |
| 12 | Voltage Transformers | TS 3.02.05 (RES) | 1.0 | September 2016 |
| 13 | Bushings | TS 3.02.07 (RES) | 1.0 | October 2014 |
| 14 | Solid Core Post Insulators for Substations | TS 3.02.09 (RES) | 1.0 | October 2014 |
| 15 | Voltage Dividers | TS 3.02.12 (RES) | 1.0 | September 2016 |
| 16 | Gas Insulated Switchgear | TS 3.02.14 (RES) | 1.0 | October 2014 |
| 17 | Environmental and Test Requirements for Electronic Equipment | TS 3.24.15 (RES) | 1.0 | October 2014 |
| 18 | Busbar Protection | TS 3.24.34 (RES) | 1.0 | October 2014 |
| 19 | Circuit Breaker Fail Protection | TS 3.24.39 (RES) | 1.0 | October 2014 |
| 20 | Synchronising And Voltage Selection | TS.3.24.60 (RES) | 2.0 | January 2018 |
| 21 | System Monitor – Dynamic System Monitoring (DSM) | TS 3.24.70 (RES) | 2.0 | February 2018 |
| 22 | System Monitoring – Fault Recording | TS 3.24.71 (RES) | 1.0 | February 2018 |
| 23 | Protection & Control for HVDC Systems | TS 3.24.90 (RES) | 1.0 | October 2014 |
| 24 | Ancillary Services Business Monitoring | TS 3.24.95 (RES) | 2.0 | February 2018 |

| | | | | |
|---|---|---|---|---|
| 25 | Operational Data Transmission | TS 3.24.100 (RES) | 1.0 | February 2018 |
| 26 | Guidance for Working in Proximity to Live Conductors | TGN(E)186 (RES) | 1.0 | October 2018 |
| | | | | |
| Additional Requirements | | | | |
| | | | | |

(b) Electronic data communications facilities and other requirements applicable in all **Transmission Areas**.

| | | |
|---|---|---|
| Communications Standards for Electronic Data Communication Facilities and Automatic Logging Devices | Version 9 | 8th April 2025 |
| EDT Interface Specification | Issue 5 | 8th April 2025 |
| EDT Submitter Guidance Note | Issue 1 | 21st Dec 2001 |
| EDL Message Interface Specification | Issue 7 | 8th April 2025 |
| EDL Instruction Interface Valid Reason Codes | Issue 9 | 7th Nov 2024 |
| MODIS Interface Specification | Version 4 | 26th May 2015 |
| Control Telephony Electrical Standard | Issue 4 | 8th April 2025 |
| Distribution Restoration Zone Control System High Level Functional Requirements | 1.0 | 4th June 2024 |

(c) Scottish **Electrical Standards** applicable for **SPT's Transmission System**.

| | | |
|---|---|---|
| RES-01-100 | Relevant Electrical Standards for Plant, Equipment and Apparatus for connection to the SP Transmission System | Issue 1 |

(d) Scottish **Electrical Standards** applicable for **SHETL's Transmission System**.

| | | |
|---|---|---|
| 1. | NGTS 1: | Rating and General Requirements for Plant, Equipment, Apparatus and Services for the National Grid System and Direct Connection to it. Issue 3 March 1999. |
| 2. | NGTS 2.1: | Substations<br>Issue 2 May 1995 |
| 3. | NGTS 3.1.1: | Substation Interlocking Schemes.<br>Issue 1 October 1993. |
| 4. | NGTS 3.2.1: | Circuit Breakers and Switches.<br>Issue 1 September 1992. |
| 5. | NGTS 3.2.2: | Disconnectors and Earthing Switches.<br>Issue 1 March 1994. |
| 6. | NGTS 3.2.3: | Metal-Oxide surge arresters for use on 132, 275 and 400kV systems.<br>Issue 2 May 1994. |
| 7. | NGTS 3.2.4: | Current Transformers for protection and General use on the 132, 275 and 400kV systems.<br>Issue 1 September 1992. |
| 8. | NGTS 3.2.5: | Voltage Transformers for use on the 132, 275 and 400 kV systems.<br>Issue 2 March 1994. |
| 9. | NGTS 3.2.6: | Current and Voltage Measurement Transformers for Settlement Metering of 33, 66, 132, 275 and 400kV systems.<br>Issue 1 September 1992. |
| 10. | NGTS 3.2.7: | Bushings for the Grid Systems.<br>Issue 1 September 1992. |
| 11. | NGTS 3.2.9: | Post Insulators for Substations.<br>Issue 1 May 1996. |
| 12. | NGTS 2.6: | Protection<br>Issue 2 June 1994. |
| 13. | NGTS 3.11.1: | Capacitors and Capacitor Banks.<br>Issued 1 March 1993. |

# APPENDIX TO THE GENERAL CONDITIONS

PART A

NOT USED

PART B

GC.B.1 Introduction

GC.B.1.1 This Appendix Part B to the **General Conditions** deals with issues arising out of the transition associated with the approval and implementation of **Grid Code Modification Proposal** GC0112 (Modifications relating to the separation of **System** operations and **Transmission Owner** roles) The process and amendments referred to in this Appendix Part B took place before the designation of **The Company** as the **ISOP** and shall be construed accordingly, including where relevant being based on those arrangements that were in place at the time.

GC.B.1.2 This Appendix Part B sets out the arrangements such that:

B.1.2.1 the **Post GC0112 Grid Code** reflects the **Transfer of the System Operator Role**;

B.1.2.2 certain amendments are made to **Grid Code Related Agreements/Documents** to reflect the **Transfer of the System Operator Role**,

B.1.2.2 arrangements can be put in place prior to the **SO Transfer Date** to enable the transition of the operations with **NGET** under the **Pre GC0112 Grid Code** to operations with **The Company** under the **Post GC0112 Grid Code**; and

B.1.2.3 each **User** co-operates in relation to the transition.

GC.B.1.3 The provisions of the **Post GC0112 Grid Code** shall be suspended until the **SO Transfer Date** except for this Appendix Part B (and any related definitions within it) which will take immediate effect on the **Implementation Date** for **GC0112**.

GC.B.1.4 In this (and solely for the purposes of this) Appendix Part B the following terms have the following meaning:

B.1.4.1 the term "**Grid Code Related Agreements/Documents**" shall mean each or any of those agreements or documents entered into under or envisaged by the **Pre GC0112 Grid Code** prior to the **SO Transfer Date** which continue on and after the **SO Transfer Date**;

B.1.4.2 the term "**GC0112**" shall mean **Grid Code Modification Proposal 0112** (Amendments relating to the transfer of the system operator functions from **NGET** to **NGESO**);

B.1.4.3 the term "**NGET**" shall mean National Grid Electricity Transmission plc;

B.1.4.4 the term "**NGESO**" shall mean National Grid Electricity System Operator Limited (No. 11014226), the company name previously given to **The Company.";**

B.1.4.5 the term "**Post GC0112 Grid Code**" means the version of the Grid Code as amended by **GC0112**;

B.1.4.6 the term "**Pre GC Grid Code**" means the version of the Grid Code prior to amendment by **GC0112**;

B.1.4.7 the term "**SO Transfer Date**" means the date on which **NGET's Transmission Licence** is transferred in part to **NGESO** to reflect the **Transfer of the System Operator Role**; and

B.1.4.8 the term "**Transfer of the System Operator Role**" means the the transfer, by means of the transfer in part of **NGET's Transmission Licence**, of the system operator role to **NGESO/The Company**.

GC.B.1.5 Without prejudice to any specific provision under this Appendix Part B as to the time within which or the manner in which any party should perform its obligations under this Appendix Part B, where a party is required to take any step or measure under this Appendix Part B, such requirement shall be construed as including any obligation to:

B.1.5.1 take such step or measure as quickly as reasonably practicable; and

B.1.5.2 do such associated or ancillary things as may be necessary to complete such step or measure as quickly as reasonably practicable.

GC.B.2 **GC0112:** Amendments to Existing Agreements and Documents

GC.B.2.1 Each **Grid Code Related Agreement/Document** in place or issued by a party in accordance with the terms of the **Pre GC0112 Grid Code** shall be read and construed, with effect from the **SO Transfer Date**, as if it (and any defined terms within it and the effect of it and those defined terms) recognise and reflect the **Transfer of the SO Functions** and as if any references in it to **NGET** in the context of its system operator role were references to **NGESO/The Company** as appropriate.

GC.B.2.2 In the context of any **Site Responsibility Schedule** in existence at the **SO Transfer Date** and which would require, following the **Transfer of the System Operator Role**, the signature of either **NGESO** instead of **NGET** or both the signature of **NGESO** and **NGET**, **NGESO** and **NGET** acknowledge and the **Users** agree that the signature of **NGET** on such **Site Responsibility Schedule** shall be considered to be the signature of **NGESO** and/or **NGET** as appropriate.

GC.B.3 **GC0112:** Transition

GC.B.3.1 Each party shall take such steps and do such things in relation to the Grid Code and the **Grid Code Related Agreements/Documentation** as are within its power and as are reasonably necessary or appropriate in order to give full and timely effect to the **Transfer of the SO Role** and the transition of the operations, systems, process and procedures and the rights and obligations relating to the **Transfer of the SO Role** under the Grid Code from **NGET** to **NGESO**.

GC. B.3.2 Each party agrees that (a) all things done by **NGET** pursuant to the Grid Code in its system operator role prior to the **SO Transfer Date** shall be deemed to have been done by **NGESO** and (b) all things received by **NGET** pursuant to the Grid Code in its system operator role (including but not limited to notices) shall be deemed to have been received by **NGESO** and (c) all things issued by **NGET** (including but not limited to notices) shall be deemed to have been issued by **NGESO**.

GC.B.3.3 In particular:

B.1.5.1 **Users** acknowledge and agree that **NGET** can exchange information and data submitted by **Users** under the Grid Code prior to the **SO Transfer Date** with **NGESO** to the extent necessary to enable the transition of the system operator role from **NGET** to **NGESO**;

B.1.5.2 **NGET** will identify and publish as soon as practicable and in any event prior to 31 January 2019 any specific requirements (such requirements being reasonable and recognising the timescale) on **Users** necessary to manage the transition of the operations, systems, process and procedures and the rights and obligations relating to the **Transfer of the SO Role** under the Grid Code from **NGET** to **NGESO**;

B.1.5.2 **Users** acknowledge that under the **Pre GC0112 Grid Code NGET** received certain data and information from **Users** which is no longer "live" data or information ("**Legacy Data**") that if it was new data and information of that type would not be available to **NGET** as a **Relevant Transmisison Licence** from the **SO Transfer Date** consent to the retention of such **Legacy Data** by **NGET** where embedded in **NGET** systems or models.

**< END OF GENERAL CONDITIONS >**

# REVISIONS
**(R)**

(This section does not form part of the Grid Code)

R.1 **The ESO Licence** sets out the way in which changes to the Grid Code are to be made and reference is also made to **The Company's** obligations under the General Conditions.

R.2 All pages re-issued have the revision number on the lower left hand corner of the page and date of the revision on the lower right hand corner of the page.

R.3 The Grid Code was introduced in March 1990 and the first issue was revised 31 times. In March 2001 the New Electricity Trading Arrangements were introduced and Issue 2 of the Grid Code was introduced which was revised 16 times. At British Electricity Trading and Transmission Arrangements (BETTA) Go-Active Issue 3 of the Grid Code was introduced and subsequently revised 35 times. At Offshore Go-active Issue 4 of the Grid Code was introduced and has been revised 13 times since its original publication. Issue 5 of the Grid Code was published to accommodate the changes made by Grid Code Modification A/10 which has incorporated the **Generator** compliance process into the Grid Code, which was revised 47 times. Issue 6 was published to incorporate all the non-material amendments as a result of modification GC0136.

R.4 This Revisions section provides a summary of the sections of the Grid Code changed by each revision to Issue 6.

R.5 All enquiries in relation to revisions to the Grid Code, including revisions to Issues 1, 2, 3, 4 and 5 should be addressed to the Grid Code development team at the following email address:

Grid.Code@nationalenergyso.com

| Revision | Section | Related Modification | Effective Date |
|---|---|---|---|
| 0 | Glossary & Definitions | GC0136 | 05 March 2021 |
| 0 | Planning Code | GC0136 | 05 March 2021 |
| 0 | Connection Conditions | GC0136 | 05 March 2021 |
| 0 | European Connection Conditions | GC0136 | 05 March 2021 |
| 0 | Demand Response Services | GC0136 | 05 March 2021 |
| 0 | Compliance Processes | GC0136 | 05 March 2021 |
| 0 | Europeans Compliance Processes | GC0136 | 05 March 2021 |
| 0 | Operating Code 1 | GC0136 | 05 March 2021 |
| 0 | Operating Code 2 | GC0136 | 05 March 2021 |
| 0 | Operating Code 5 | GC0136 | 05 March 2021 |
| 0 | Operating Code 6 | GC0136 | 05 March 2021 |
| 0 | Operating Code 7 | GC0136 | 05 March 2021 |
| 0 | Operating Code 8 | GC0136 | 05 March 2021 |
| 0 | Operating Code 8A | GC0136 | 05 March 2021 |
| 0 | Operating Code 8B | GC0136 | 05 March 2021 |
| 0 | Operating Code 9 | GC0136 | 05 March 2021 |
| 0 | Operating Code 11 | GC0136 | 05 March 2021 |
| 0 | Operating Code 12 | GC0136 | 05 March 2021 |
| 0 | Balancing Code 2 | GC0136 | 05 March 2021 |

| Revision | Section | Related Modification | Effective Date |
|---|---|---|---|
| 0 | Balancing Code 3 | GC0136 | 05 March 2021 |
| 0 | Balancing Code 4 | GC0136 | 05 March 2021 |
| 0 | Balancing Code 5 | GC0136 | 05 March 2021 |
| 0 | Data Registration Code | GC0136 | 05 March 2021 |
| 0 | General Conditions | GC0136 | 05 March 2021 |
| 0 | Governance Rules | GC0136 | 05 March 2021 |
| 1 | Glossary & Definitions | GC0130 | 18 March 2021 |
| 1 | Operating Code 2 | GC0130 | 18 March 2021 |
| 1 | Data Registration Code | GC0130 | 18 March 2021 |
| 1 | General Conditions | GC0130 | 18 March 2021 |
| 2 | Glossary & Definitions | GC0147 | 17 May 2021 |
| 2 | Operating Code 6B | GC0147 | 17 May 2021 |
| 2 | Operating Code 7 | GC0147 | 17 May 2021 |
| 2 | Balancing Code 1 | GC0147 | 17 May 2021 |
| 2 | Balancing Code 2 | GC0147 | 17 May 2021 |
| 3 | Balancing Code 2 | GC0144 | 26 May 2021 |
| 3 | Balancing Code 4 | GC0144 | 26 May 2021 |
| 4 | Preface | GC0149 | 03 August 2021 |
| 4 | Glossary & Definitions | GC0149 | 03 August 2021 |
| 4 | Planning Code | GC0149 | 03 August 2021 |

| Revision | Section | Related Modification | Effective Date |
|---|---|---|---|
| 4 | European Connection Conditions | GC0149 | 03 August 2021 |
| 4 | European Compliance Processes | GC0149 | 03 August 2021 |
| 4 | Demand Response Services Code | GC0149 | 03 August 2021 |
| 4 | Operating Code 2 | GC0149 | 03 August 2021 |
| 4 | Balancing Code 4 | GC0149 | 03 August 2021 |
| 4 | Data Registration Code | GC0149 | 03 August 2021 |
| 4 | Governance Rules | GC0149 | 03 August 2021 |
| 5 | Operating Code 7 | GC0109 | 23 August 2021 |
| 6 | Connection Conditions | GC0134 | 01 September 2021 |
| 6 | European Connection Conditions | GC0134 | 01 September 2021 |
| 6 | Balancing Code 2 | GC0134 | 01 September 2021 |
| 7 | Operating Code 6B | GC0150 | 04 October 2021 |
| 8 | Operating Code 2 | GC0151 | 08 November 2021 |
| 8 | Operating Code 3 | GC0151 | 08 November 2021 |
| 8 | Operating Code 5 | GC0151 | 08 November 2021 |
| 9 | Governance Rules | GC0152 | 29 December 2021 |
| 10 | General Conditions | Electrical Standards - EDL Instruction Interface Valid Reason Codes | 20 January 2022 |
| 11 | Glossary & Definitions | GC0137 | 14 February 2022 |
| 11 | Planning Code | GC0137 | 14 February 2022 |

| Revision | Section | Related Modification | Effective Date |
|---|---|---|---|
| 11 | Connection Conditions | GC0137 | 14 February 2022 |
| 11 | European Connection Conditions | GC0137 | 14 February 2022 |
| 11 | European Compliance Processes | GC0137 | 14 February 2022 |
| 11 | Data Registration Code | GC0137 | 14 February 2022 |
| 12 | Glossary & Definitions | GC0153 | 09 March 2022 |
| 12 | Connection Conditions | GC0153 | 09 March 2022 |
| 12 | European Connection Conditions | GC0153 | 09 March 2022 |
| 12 | Operating Code 6 | GC0153 | 09 March 2022 |
| 12 | Operating Code 8A | GC0153 | 09 March 2022 |
| 12 | Operating Code 8B | GC0153 | 09 March 2022 |
| 12 | Operating Code 12 | GC0153 | 09 March 2022 |
| 12 | Balancing Code 2 | GC0153 | 09 March 2022 |
| 12 | Governance Rules | GC0153 | 09 March 2022 |
| 13 | Compliance Processes | GC0138 | 24 June 2022 |
| 13 | European Compliance Processes | GC0138 | 24 June 2022 |
| 13 | Operating Code 5 | GC0138 | 24 June 2022 |
| 14 | Glossary & Definitions | GC0157 | 06 October 2022 |
| 14 | European Connection Conditions | GC0157 | 06 October 2022 |
| 14 | Operating Code 2 | GC0157 | 06 October 2022 |
| 14 | Operating Code 5 | GC0157 | 06 October 2022 |

| Revision | Section | Related Modification | Effective Date |
|---|---|---|---|
| 14 | Data Registration Code | GC0157 | 06 October 2022 |
| 14 | No changes to published Grid Code | GC0158 | 06 December 2022 |
| 15 | Glossary & Definitions | GC0160 | 07 December 2022 |
| 15 | Balancing Code 1 | GC0160 | 07 December 2022 |
| 15 | Balancing Code 2 | GC0160 | 07 December 2022 |
| 16 | Planning Code | GC0141 | 05 January 2023 |
| 16 | Connection Conditions | GC0141 | 05 January 2023 |
| 16 | European Connection Conditions | GC0141 | 05 January 2023 |
| 16 | Compliance Processes | GC0141 | 05 January 2023 |
| 16 | European Compliance Processes | GC0141 | 05 January 2023 |
| 17 | Connection Conditions | GC0148 | 4 September 2023 |
| 17 | European Compliance Processes | GC0148 | 4 September 2023 |
| 17 | European Connection Conditions | GC0148 | 4 September 2023 |
| 17 | General Conditions | GC0148 | 4 September 2023 |
| 17 | Glossary & Definitions | GC0148 | 4 September 2023 |
| 17 | Operating Code 5 | GC0148 | 4 September 2023 |
| 17 | Operating Code 6 | GC0148 | 4 September 2023 |
| 17 | Planning Code | GC0148 | 4 September 2023 |
| 18 | Operating Code 6 | GC0161 | 2 October 2023 |
| 19 | European Connection Conditions | GC0165 | 4 December 2023 |

| Revision | Section | Related Modification | Effective Date |
|---|---|---|---|
| 19 | Operating Code 12 | GC0165 | 4 December 2023 |
| 19 | Data Registration Code | GC0165 | 4 December 2023 |
| 19 | Governance Rules | GC0165 | 4 December 2023 |
| 20 | Operating Code 6 | GC0162 | 15 December 2023 |
| 21 | Glossary & Definitions | GC0156 | 4 March 2024 |
| 21 | Planning Code | GC0156 | 4 March 2024 |
| 21 | Connection Conditions | GC0156 | 4 March 2024 |
| 21 | European Connection Conditions | GC0156 | 4 March 2024 |
| 21 | Operating Code 1 | GC0156 | 4 March 2024 |
| 21 | Operating Code 2 | GC0156 | 4 March 2024 |
| 21 | Operating Code 5 | GC0156 | 4 March 2024 |
| 21 | Operating Code 9 | GC0156 | 4 March 2024 |
| 21 | Balancing Code 2 | GC0156 | 4 March 2024 |
| 21 | Balancing Code 4 | GC0156 | 4 March 2024 |
| 21 | Data Registration Code | GC0156 | 4 March 2024 |
| 21 | General Conditions | GC0156 | 4 March 2024 |
| 22 | Glossary & Definitions | GC0154 | 2 April 2024 |
| 22 | Balancing Code 1 | GC0154 | 2 April 2024 |
| 22 | Balancing Code 2 | GC0154 | 2 April 2024 |
| 23 | Glossary & Definitions | GC0170 | 22 April 2024 |

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| 23 | Planning Code | GC0170 | 22 April 2024 |
| 23 | Connection Conditions | GC0170 | 22 April 2024 |
| 23 | European Connection Conditions | GC0170 | 22 April 2024 |
| 23 | Operating Code 2 | GC0170 | 22 April 2024 |
| 23 | Operating Code 5 | GC0170 | 22 April 2024 |
| 23 | Operating Code 9 | GC0170 | 22 April 2024 |
| 23 | Data Registration Code | GC0170 | 22 April 2024 |
| 23 | General Conditions | GC0170 | 22 April 2024 |
| 24 | General Conditions | Distribution Restoration Zone Control System Standard | 4 June 2024 |
| 25 | Glossary & Definitions | GC0163 | 5 July 2024 |
| 25 | European Connection Conditions | GC0163 | 5 July 2024 |
| 26 | Glossary & Definitions | GC0171 | 5 September 2024 |
| 26 | Compliance Processes | GC0171 | 5 September 2024 |
| 26 | European Compliance Processes | GC0171 | 5 September 2024 |
| 27 | Glossary & Definitions | Establishing ISOP in industry codes 2024 | 1 October 2024 |
| 27 | Planning Code | Establishing ISOP in industry codes 2024 | 1 October 2024 |
| 27 | Connection Conditions | Establishing ISOP in industry codes 2024 | 1 October 2024 |
| 27 | European Connection Conditions | Establishing ISOP in industry codes | 1 October 2024 |

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|---|---|---|---|
| | | 2024 | |
| 27 | Demand Response Services | Establishing ISOP in industry codes 2024 | 1 October 2024 |
| 27 | Compliance Processes | Establishing ISOP in industry codes 2024 | 1 October 2024 |
| 27 | European Compliance Processes | Establishing ISOP in industry codes 2024 | 1 October 2024 |
| 27 | Operating Code 2 | Establishing ISOP in industry codes 2024 | 1 October 2024 |
| 27 | Data Registration Code | Establishing ISOP in industry codes 2024 | 1 October 2024 |
| 27 | General Conditions | Establishing ISOP in industry codes 2024 | 1 October 2024 |
| 27 | Governance Rules | Establishing ISOP in industry codes 2024 | 1 October 2024 |
| 28 | General Conditions | Electrical Standards - EDL Instruction Interface Valid Reason Codes | 7 November 2024 |
| 29 | Glossary & Definitions | GC0175 | 28 March 2025 |
| 29 | Connection Conditions | GC0175 | 28 March 2025 |
| 29 | European Connection Conditions | GC0175 | 28 March 2025 |
| 29 | Operating Code 7 | GC0175 | 28 March 2025 |
| 29 | Balancing Code 1 | GC0175 | 28 March 2025 |

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|---|---|---|---|
| 29 | Balancing Code 2 | GC0175 | 28 March 2025 |
| 29 | General Conditions | GC0175 | 28 March 2025 |
| 30 | Glossary & Definitions | GC0172 | 3 April 2025 |
| 30 | General Conditions | GC0172 | 3 April 2025 |
| 31 | Glossary & Definitions | GC0159 | 8 April 2025 |
| 31 | Planning Code | GC0159 | 8 April 2025 |
| 31 | Operating Code 9 | GC0159 | 8 April 2025 |
| 31 | General Conditions | Electrical Standards - Electronic Data Transfer (EDT) Interface Specification, Communications Standards, EDL Message Interface Specification, Control Telephony Standard | 8 April 2025 |

**< END OF REVISIONS >**