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### THE GRID CODE

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(REVISIONS which does not form \( \text{(R)} \))

( part of the Grid Code )
PREFACE

1. The operating procedures and principles governing NGET's relationship with all Users of the GB Transmission System, be they Generators, DC Converter owners, Suppliers or Non-Embedded Customers are set out in the Grid Code. The Grid Code specifies day-to-day procedures for both planning and operational purposes and covers both normal and exceptional circumstances.

2. The Grid Code is designed to permit the development, maintenance and operation of an efficient, co-ordinated and economical GB Transmission System, to facilitate competition in the generation and supply of electricity and is conceived as a statement of what is optimal (particularly from a technical point of view) for all Users and NGET itself in relation to the planning, operation and use of the GB Transmission System. It seeks to avoid any undue discrimination between Users and categories of Users.

3. The Grid Code is divided into the following sections:-

(a) a Planning Code which provides generally for the supply of certain information by Users in order for NGET to undertake the planning and development of the GB Transmission System;

(b) Connection Conditions, which specify the minimum technical, design and operational criteria which must be complied with by NGET at Connection Sites and by Users connected to or seeking connection with the GB Transmission System or by Generators (other than in respect of Small Power Stations) or DC Converter owners, connected to or seeking connection to a User's System;

(c) an Operating Code, which is split into a number of sections and deals with Demand forecasting (OC1); the co-ordination of the outage planning process in respect of Large Power Stations, the GB Transmission System and User Systems for construction, repair and maintenance, and the provision of certain types of Operating Margin data (OC2); testing and monitoring of Users (OC5); different forms of reducing Demand (OC6); the reporting of scheduled and planned actions, and unexpected occurrences such as faults (OC7); the co-ordination, establishment and maintenance of Isolation and Earthing in order that work and/or testing can be carried out safely (OC8); certain aspects of contingency planning (OC9); the provision of written reports on occurrences such as faults in certain circumstances (OC10); the procedures for numbering and nomenclature of HV Apparatus at certain sites (OC11); and the procedures for the establishment of System Tests (OC12);

(d) a Balancing Code, which is split into three sections and deals with the submission of BM Unit Data from BM Participants, and of certain other information, for the following day and ahead of Gate Closure (BC1); the post Gate Closure process (BC2); and the procedures and requirements in relation to System Frequency control (BC3);
(e) a Data Registration Code, which sets out a unified listing of all data required by NGET from Users, and by Users from NGET, under the Grid Code;

(f) General Conditions, which are intended to ensure, so far as possible, that the various sections of the Grid Code work together and work in practice and include provisions relating to the establishment of a Grid Code Review Panel and other provisions of a general nature.

4. This Preface is provided to Users and to prospective Users for information only and does not constitute part of the Grid Code.
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:

**Access Group**
A group of Connection Points within which a User declares under the Planning Code
- i) An interconnection and/or
- ii) A need to redistribute Demand between those Connection Points either pre-fault or post-fault
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**

**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:

- 1000 Wh = 1 kWh
- 1000 kWh = 1 MWh
- 1000 MWh = 1 GWh
- 1000 GWh = 1 TWh.

**Active Power**
The product of voltage and the in-phase component of alternating current measured in units of watts and standard multiples thereof, ie:

- 1000 Watts = 1 kW
- 1000 kW = 1 MW
- 1000 MW = 1 GW
- 1000 GW = 1 TW.

**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.
<table>
<thead>
<tr>
<th><strong>Ancillary Service</strong></th>
<th>A System Ancillary Service and/or a Commercial Ancillary Service, as the case may be.</th>
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<tr>
<td><strong>Ancillary Services Agreement</strong></td>
<td>An agreement between a User and NGET for the payment by NGET to that User in respect of the provision by such User of Ancillary Services.</td>
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<td><strong>Annual Average Cold Spell Conditions or ACS Conditions</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>
| **Apparent Power** | The product of voltage and of alternating current measured in units of voltamperes and standard multiples thereof, ie:  

\[
1000 \text{ VA} = 1 \text{ kVA} \\
1000 \text{ kVA} = 1 \text{ MVA}.
\]  |
| **Apparatus** | Other than in OC8, means all equipment in which electrical conductors are used, supported or of which they may form a part. 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. |
| **Authorised Electricity Operator** | Any person (other than NGET in its capacity as operator of the National Electricity Transmission System) who is authorised under the Act to generate, participate in the transmission of, distribute or supply electricity. |
| **Automatic Voltage Regulator or AVR** | The continuously acting automatic equipment controlling the terminal voltage of a Synchronous Generating Unit by comparing the actual terminal voltage with a reference value and controlling by appropriate means the output of an Exciter, depending on the deviations. |
| **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 |
| **Auxiliaries** | Any item of Plant and/or Apparatus not directly a part of the boiler plant or Generating Unit or DC Converter or Power Park Module, but required for the boiler plant's or Generating Unit's or DC Converter's or Power Park Module's functional operation. |
| **Auxiliary Diesel Engine** | A diesel engine driving a 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. |
**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**  
Protection equipment or system which is intended to operate when a system fault is not cleared in due time because of failure or inability of the Main Protection to operate or in case of failure to operate of a circuit-breaker other than the associated circuit breaker.

**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 NGET's Transmission 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 NGET in accordance with Condition C16 of NGET’s Transmission Licence.

**Bid-Offer Acceptance**  
a) A communication issued by NGET in accordance with BC2.7; or  
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

**Black Start**  
The procedure necessary for a recovery from a Total Shutdown or Partial Shutdown.
**Black Start Capability**  An ability in respect of a **Black Start Station**, for at least one of its **Gensets** to **Start-Up** from **Shutdown** and to energise a part of the **System** and be **Synchronised** to the **System** upon instruction from **NGET**, within two hours, without an external electrical power supply.

**Black Start Stations**  **Power Stations** which are registered, pursuant to the **Bilateral Agreement** with a **User**, as having a **Black Start Capability**.

**Black Start Test**  A **Black Start Test** carried out by a **Generator** with a **Black Start Station**, on the instructions of **NGET**, in order to demonstrate that a **Black Start Station** has a **Black Start Capability**.

**Block Load Capability**  The incremental **Active Power** steps, from no load to **Rated MW**, which a generator can instantaneously supply without causing it to trip or go outside the **Frequency** range of 47.5 – 52Hz (or an otherwise agreed **Frequency** range). The time between each incremental step shall also be provided.

**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**, 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**.

**BS Station Test**  A **Black Start Test** carried out by a **Generator** with a **Black Start Station** while the **Black Start Station** is disconnected from all external alternating current electrical supplies.
| **BS Unit Test** | A **Black Start Test** carried out on a **Generating Unit** or a **CCGT Unit**, as the case may be, at a **Black Start Station** while the **Black Start Station** remains connected to an external alternating current electrical supply. |
| **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. |
| **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:  
1. Moriston  
2. Killin  
3. Garry  
4. Conon  
5. Clunie  
6. Beauly  
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**. |
| **Caution Notice** | A notice conveying a warning against interference. |
| **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:-
(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
(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,

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 NGET 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.

CENELEC

European Committee for Electrotechnical Standardisation.

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.

Cluster

1. Before Telemetry

A cluster of wind turbines will be formed when the total wind capacity within any circle of five kilometre radius has a Registered Capacity of not less than 5MW

2. After Telemetry

Any wind turbine installed within a five kilometre radius of the anemometer position (whether installed before or after the installation of that anemometer) will be deemed to be within the cluster for that anemometer and will not count towards the creation of any new cluster. All other wind turbines may count towards the creation of further clusters.
**Combined Cycle Gas Turbine Module or CCGT Module**

A collection of Generating Units (registered as a CCGT 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 NGET in operating the Total System if a User (or other person) 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).
<table>
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<th><strong>Commercial Boundary</strong></th>
<th>Has the meaning set out in the CUSC</th>
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<td><strong>Committed Project</strong></td>
<td>Data relating to a User Development once the offer for a CUSC Contract is accepted.</td>
</tr>
<tr>
<td><strong>Planning Data</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Common Collection</strong></td>
<td>A busbar within a Power Park Module to which the higher voltage side of two or more Power Park Unit generator transformers are connected.</td>
</tr>
<tr>
<td><strong>Busbar</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Completion Date</strong></td>
<td>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 having a similar meaning in relation to the Network Operator's System as set out in the Embedded Development Agreement.</td>
</tr>
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<td><strong>Complex</strong></td>
<td>A Connection Site together with the associated Power Station and/or Network Operator substation and/or associated Plant and/or Apparatus, as appropriate.</td>
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<td><strong>Connection</strong></td>
<td>That portion of the Grid Code which is identified as the Connection Conditions.</td>
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<tr>
<td><strong>Conditions or CC</strong></td>
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<td><strong>Connection Entry</strong></td>
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<tr>
<td><strong>Connected Planning</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Data</strong></td>
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<td><strong>Connection Point</strong></td>
<td>A Grid Supply Point or Grid Entry Point, as the case may be.</td>
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<tr>
<td><strong>Connection Site</strong></td>
<td>A Transmission Site or User Site, as the case may be.</td>
</tr>
<tr>
<td><strong>Construction</strong></td>
<td>Has the meaning set out in the CUSC</td>
</tr>
<tr>
<td><strong>Agreement</strong></td>
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</tr>
</tbody>
</table>
**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 Calls**  
A telephone call whose destination and/or origin is a key on the control desk telephone keyboard at a **Transmission Control Centre** and which, for the purpose of **Control Telephony**, has 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 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.

**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:-

a) A **Non-Embedded Customer's Plant** and **Apparatus** is controlled; or

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:

   (i) 50MW or more in **NGET's Transmission Area**; or  
   (ii) 30MW or more in **SPT's Transmission Area**; or  
   (iii) 10MW or more in **SHETL's Transmission Area**,  
   (iv) 10MW or more which is connected to an **Offshore Transmission System**

   is physically controlled by a **BM Participant**; or

c) In the case of any other **BM Unit** or **Generating Unit**, data submission is co-ordinated for a **BM Participant** and instructions are received from **NGET**, 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 **NGET**. In the case of a **DC Converter Station**, the **Control Point** will be at a location agreed with **NGET**. 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 and NGET Control Engineer(s) speak to one another for the purposes of control of the Total System in both normal and emergency operating conditions.

CUSC  Has the meaning set out in NGET’s Transmission Licence

CUSC Contract  One or more of the following agreements as envisaged in Standard Condition C1 of NGET’s Transmission Licence:
(a) the CUSC Framework Agreement;
(b) a Bilateral Agreement;
(c) a Construction Agreement
or a variation to an existing Bilateral Agreement and/or Construction Agreement;

CUSC Framework Agreement  Has the meaning set out in NGET’s Transmission Licence

Customer  A person to whom electrical power is provided (whether or not he is 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 NGET 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 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.

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 NGET under the Grid Code as set out in the document “Data Validation, Consistency and Defaulting Rules” - Issue 7, dated 11th October 2004. The document is available on the National Grid website or upon request from NGET.

DC Converter  Any Onshore DC Converter or Offshore DC Converter.
**DC Converter Station**  
An installation comprising one or more **Onshore DC Converters** connecting a direct current interconnector:

- to the **NGET Transmission System**; or,
- (if the installation has a rating of 50MW or more) to a **User System**, 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**.

**De-Load**  
The condition in which a **Genset** has reduced or is not delivering electrical power to the **System** to which it is **Synchronised**.

**Demand**  
The demand of MW and Mvar of electricity (i.e. both **Active** and **Reactive Power**), unless otherwise stated.

**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:

(a) **Customer** voltage reduction initiated by **Network Operators** (other than following an instruction from **NGET**);

(b) **Customer Demand** reduction by **Disconnection** initiated by **Network Operators** (other than following an instruction from **NGET**);

(c) **Demand** reduction instructed by **NGET**;

(d) automatic low **Frequency Demand Disconnection**;

(e) emergency manual **Demand Disconnection**.

**Demand Control Notification Level**  
The level above which a **Network Operator** has to notify **NGET** of its proposed or achieved use of **Demand Control** which is 12 MW in England and Wales and 5 MW in Scotland.
**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 **Generating Unit**, **Power Park Module** or **DC Converter** off a **System** to which it has been **Synchronised**, by opening any connecting circuit breaker; or

b) The act of ceasing to consume electricity at an importing **BM Unit**;

and the term "**De-Synchronising**" shall be construed accordingly.

**De-synchronised Island(s)**
Has the meaning set out in OC9.5.1(a)

**Detailed Planning Data**
**Detailed Planning Data**

**Discrimination**
The quality where a relay or protective system is enabled to pick out and cause to be disconnected only the faulty **Apparatus**.

**Disconnection**
The physical separation of **Users** (or **Customers**) from the **National Electricity Transmission System** or a **User System** as the case may be.

**Disputes Resolution Procedure**
The procedure described in the **CUSIC** 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**.

**Droop**
The ratio of the per unit steady state change in speed, or in **Frequency** to the per unit steady state change in power output.

**Dynamic Parameters**
Those parameters listed in Appendix 1 to **BC1** under the heading **BM Unit Data – Dynamic Parameters**.

**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 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 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.
Earthing
A way of providing a connection between conductors and earth by an Earthing Device which is either:

(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

(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.

Electrical Standard
A standard listed in the Annex to the General Conditions.

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 Supply Industry Arbitration Association
The unincorporated members' club of that name formed inter alia to promote the efficient and economic operation of the procedure for the resolution of disputes within the electricity supply industry by means of arbitration or otherwise in accordance with its arbitration rules.

Electricity Supply Licence
The licence granted pursuant to Section 6(1) (d) of the Act.

Electromagnetic Compatibility Level
Has the meaning set out in Engineering Recommendation G5/4.

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 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)
<table>
<thead>
<tr>
<th><strong>Embedded Development Agreement</strong></th>
<th>An agreement entered into between a <strong>Network Operator</strong> and an <strong>Embedded Person</strong>, identifying the relevant site of connection to the <strong>Network Operator's System</strong> and setting out other site specific details in relation to that use of the <strong>Network Operator's System</strong>.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Embedded Person</strong></td>
<td>The party responsible for a <strong>Medium Power Station</strong> not subject to a <strong>Bilateral Agreement</strong> or <strong>DC Converter Station</strong> not subject to a <strong>Bilateral Agreement</strong> connected to or proposed to be connected to a <strong>Network Operator's System</strong>.</td>
</tr>
<tr>
<td><strong>Emergency Deenergisation Instruction</strong></td>
<td>an <strong>Emergency Instruction</strong> issued by <strong>NGET</strong> to <strong>De-Synchronise</strong> a <strong>Generating Unit</strong>, <strong>Power Park Module</strong> or <strong>DC Converter</strong> in circumstances specified in the <strong>CUSC</strong>.</td>
</tr>
<tr>
<td><strong>Emergency Instruction</strong></td>
<td>An instruction issued by <strong>NGET</strong> in emergency circumstances, pursuant to <strong>BC2.9</strong>, to the <strong>Control Point</strong> of a <strong>User</strong>. In the case of such instructions applicable to a <strong>BM Unit</strong>, it may require an action or response which is outside the <strong>Dynamic Parameters</strong>, <strong>QPN</strong> or <strong>Other Relevant Data</strong>, and may include an instruction to <strong>trip a Genset</strong>.</td>
</tr>
<tr>
<td><strong>Engineering Recommendations</strong></td>
<td>The documents referred to as such and issued by the Electricity Association or the former Electricity Council.</td>
</tr>
<tr>
<td><strong>Estimated Registered Data</strong></td>
<td>Those items of <strong>Standard Planning Data</strong> and <strong>Detailed Planning Data</strong> which either upon connection will become <strong>Registered Data</strong>, or which for the purposes of the <strong>Plant</strong> and/or <strong>Apparatus</strong> concerned as at the date of submission are <strong>Registered Data</strong>, but in each case which for the seven succeeding <strong>Financial Years</strong> will be an estimate of what is expected.</td>
</tr>
<tr>
<td><strong>European Specification</strong></td>
<td>A common technical specification, a <strong>British Standard</strong> implementing a European standard or a European technical approval. The terms &quot;common technical specification&quot;, &quot;European standard&quot; and &quot;European technical approval&quot; shall have the meanings respectively ascribed to them in the <strong>Regulations</strong>.</td>
</tr>
<tr>
<td><strong>Event</strong></td>
<td>An unscheduled or unplanned (although it may be anticipated) occurrence on, or relating to, a <strong>System</strong> (including <strong>Embedded Power Stations</strong>) including, without limiting that general description, faults, incidents and breakdowns and adverse weather conditions being experienced.</td>
</tr>
<tr>
<td><strong>Exciter</strong></td>
<td>The source of the electrical power providing the field current of a synchronous machine.</td>
</tr>
<tr>
<td><strong>Excitation System</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>
**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.

**Excitation System Nominal Response**
Shall have the meaning ascribed to that term in IEC 34-16-1:1991 [equivalent to British Standard BS4999 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 BS4999 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 BS4999 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**) :-

- Dungeness B
- Hinkley Point B
- Heysham 1
- Heysham 2
- Hartlepool
- Hunterston B
- 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 NGET 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 NGET) 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 NGET 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**.
**Existing Magnox Reactor Plant**

The following nuclear gas cooled reactor plant (which was commissioned and connected to the **Total System** at the **Transfer Date**):-

- Calder Hall
- Chapelcross
- Dungeness A
- Hinkley Point A
- Oldbury-on-Severn
- Bradwell
- Sizewell A
- 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.

**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**.

**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).

**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.

**Final Generation Outage Programme**

An outage programme as agreed by **NGET** with each **Generator** 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 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 NGET (if it did not propose the System Test) and other members of the Test Panel.

Financial Year

Bears the meaning given in Condition A1 (Definitions and Interpretation) of NGET’s Transmission Licence.

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 Sensitive AGR Unit

Each Generating Unit in an Existing AGR Plant for which the Generator has notified NGET 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.

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 NGET in relation to operation in Frequency Sensitive Mode (or such greater number as may be agreed between NGET 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 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.
<table>
<thead>
<tr>
<th><strong>Fuel Security Code</strong></th>
<th>The document of that title designated as such by the Secretary of State, as from time to time amended.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gas Turbine Unit</strong></td>
<td>A <strong>Generating Unit</strong> driven by a gas turbine (for instance by an aero-engine).</td>
</tr>
<tr>
<td><strong>Gas Zone Diagram</strong></td>
<td>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 <strong>Connection Site</strong>, 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.</td>
</tr>
<tr>
<td><strong>Gate Closure</strong></td>
<td>Has the meaning set out in the BSC.</td>
</tr>
<tr>
<td><strong>General Conditions or GC</strong></td>
<td>That portion of the Grid Code which is identified as the General Conditions.</td>
</tr>
<tr>
<td><strong>Generating Plant Demand Margin</strong></td>
<td>The difference between <strong>Output Usable</strong> and forecast <strong>Demand</strong>.</td>
</tr>
<tr>
<td><strong>Generating Unit</strong></td>
<td>An Onshore Generating Unit and/or an Offshore Generating Unit.</td>
</tr>
<tr>
<td><strong>Generating Unit Data</strong></td>
<td>The <strong>Physical Notification</strong>, Export and Import Limits and Other Relevant Data only in respect of each <strong>Generating Unit</strong>:</td>
</tr>
<tr>
<td></td>
<td>(a) which forms part of the <strong>BM Unit</strong> which represents that Cascade Hydro Scheme;</td>
</tr>
<tr>
<td></td>
<td>(b) at an <strong>Embedded Exemptable Large Power Station</strong>, where the relevant <strong>Bilateral Agreement</strong> specifies that compliance with BC1 and/or BC2 is required:</td>
</tr>
<tr>
<td></td>
<td>i) to each <strong>Generating Unit</strong>, or</td>
</tr>
<tr>
<td></td>
<td>ii) to each <strong>Power Park Module</strong> where the <strong>Power Station</strong> comprises <strong>Power Park Modules</strong></td>
</tr>
<tr>
<td><strong>Generation Capacity</strong></td>
<td>Has the meaning set out in the BSC.</td>
</tr>
<tr>
<td><strong>Generation Planning Parameters</strong></td>
<td>Those parameters listed in Appendix 2 of OC2.</td>
</tr>
<tr>
<td><strong>Generator</strong></td>
<td>A person who generates electricity under licence or exemption under the Act acting in its capacity as a generator in Great Britain or Offshore.</td>
</tr>
<tr>
<td><strong>Generator Performance Chart</strong></td>
<td>A diagram which shows the MW and Mvar capability limits within which a <strong>Generating Unit</strong> will be expected to operate under steady state conditions.</td>
</tr>
<tr>
<td><strong>Genset</strong></td>
<td>A Generating Unit, Power Park Module or CCGT Module at a Large Power Station or any Generating Unit, Power Park Module or CCGT Module which is directly connected to the National Electricity Transmission System.</td>
</tr>
<tr>
<td><strong>Good Industry Practice</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Governor Deadband</strong></td>
<td>The total magnitude of the change in steady state speed (expressed as a range of Hz (± x Hz) where &quot;x&quot; is a numerical value) within which there is no resultant change in the position of the governing valves of the speed/load Governing System.</td>
</tr>
<tr>
<td><strong>Great Britain or GB</strong></td>
<td>The landmass of England and Wales and Scotland, including internal waters.</td>
</tr>
<tr>
<td><strong>Grid Code Review Panel or Panel</strong></td>
<td>The panel with the functions set out in GC.4.</td>
</tr>
<tr>
<td><strong>Grid Entry Point</strong></td>
<td>An Onshore Grid Entry Point or an Offshore Grid Entry Point..</td>
</tr>
<tr>
<td><strong>Grid Supply Point</strong></td>
<td>A point of supply from the National Electricity Transmission System to Network Operators or Non-Embedded Customers.</td>
</tr>
<tr>
<td><strong>Group</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>High Frequency Response</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>High Voltage or HV</strong></td>
<td>For E&amp;W Transmission Systems, a voltage exceeding 650 volts. .For Scottish Transmission Systems, a voltage exceeding 1000 volts.</td>
</tr>
<tr>
<td><strong>HV Connections</strong></td>
<td><strong>Apparatus</strong> 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.</td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>HP Turbine Power</strong></td>
<td><strong>Fraction</strong> 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.</td>
</tr>
<tr>
<td><strong>IEC</strong></td>
<td>International Electrotechnical Commission.</td>
</tr>
<tr>
<td><strong>IEC Standard</strong></td>
<td>A standard approved by the International Electrotechnical Commission.</td>
</tr>
<tr>
<td><strong>Import Usable</strong></td>
<td>That portion of Registered Import Capacity which is expected to be available and which is not unavailable due to a Planned Outage.</td>
</tr>
<tr>
<td><strong>Incident Centre</strong></td>
<td>A centre established by NGET or a User as the focal point in NGET or in that User, as the case may be, for the communication and dissemination of information between the senior management representatives of NGET, or of that User, as the case may be, and the relevant other parties during a Joint System Incident in order to avoid overloading NGET's, or that User's, as the case may be, existing operational/control arrangements.</td>
</tr>
<tr>
<td><strong>Indicated Constraint Boundary Margin</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Indicated Imbalance</strong></td>
<td>The difference between the sum of Physical Notifications for BM Units comprising Generating Units or CCGT Modules and the forecast of Demand for the whole or any part of the System.</td>
</tr>
<tr>
<td><strong>Indicated Margin</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Instructor Facilities</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Integral Equipment Test or IET</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Interconnection Agreement</strong></td>
<td>An agreement made between <strong>NGET</strong> and an <strong>Externally Interconnected System Operator</strong> and/or an <strong>Interconnector User</strong> and/or other relevant persons for the <strong>External Interconnection</strong> relating to an <strong>External Interconnection</strong> and/or an agreement under which an <strong>Interconnector User</strong> can use an <strong>External Interconnection</strong>.</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Interconnector User</strong></td>
<td>Has the meaning set out in the <strong>BSC</strong>.</td>
</tr>
<tr>
<td><strong>Interface Agreement</strong></td>
<td>Has the meaning set out in the <strong>CUSC</strong>.</td>
</tr>
<tr>
<td><strong>Interface Point</strong></td>
<td>as the context admits or requires either;</td>
</tr>
<tr>
<td></td>
<td>(a) the electrical point of connection between an <strong>Offshore Transmission System</strong> and an <strong>Onshore Transmission System</strong>, or</td>
</tr>
<tr>
<td></td>
<td>(b) the electrical point of connection between an <strong>Offshore Transmission System</strong> and a <strong>Network Operator’s User System</strong>.</td>
</tr>
<tr>
<td><strong>Interface Point Target Voltage/Power factor</strong></td>
<td>The nominal target voltage/power factor at an <strong>Interface Point</strong> which a <strong>Network Operator</strong> requires <strong>NGET</strong> to achieve by operation of the relevant <strong>Offshore Transmission System</strong>.</td>
</tr>
<tr>
<td><strong>Intermittent Power Source</strong></td>
<td>The primary source of power for a <strong>Generating Unit</strong> that can not be considered as controllable, e.g. wind, wave or solar.</td>
</tr>
<tr>
<td><strong>Intertripping</strong></td>
<td>(a) The tripping of circuit-breaker(s) by commands initiated from <strong>Protection</strong> at a remote location independent of the state of the local <strong>Protection</strong>; or</td>
</tr>
<tr>
<td></td>
<td>(b) <strong>Operational Intertripping</strong>.</td>
</tr>
<tr>
<td><strong>Intertrip Apparatus</strong></td>
<td><strong>Apparatus</strong> which performs <strong>Intertripping</strong>.</td>
</tr>
<tr>
<td><strong>IP Turbine Power Fraction</strong></td>
<td>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 <strong>Registered Capacity</strong>.</td>
</tr>
<tr>
<td><strong>Isolating Device</strong></td>
<td>A device for achieving <strong>Isolation</strong>.</td>
</tr>
</tbody>
</table>
**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:

(a) an **Isolating Device** maintained in an isolating position. The isolating position must either be:

(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

(ii) maintained and/or secured 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; or

(b) an adequate physical separation which must be in accordance with and maintained by the method set out in the **Local Safety Instructions** of **NGET** or the **Safety Rules** of the **Relevant Transmission Licensee** or that **User**, as the case may be.

**Joint BM Unit Data**

Has the meaning set out in the **BSC**.

**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 **NGET** 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.

**Large Power Station** A Power Station which is

(A) directly connected to:

(a) NGET’s Transmission System where such Power Station has a Registered Capacity of 100MW or more; or
(b) SPT’s Transmission System where such Power Station has a Registered Capacity of 30MW or more; or
(c) SHETL’s Transmission System where such Power Station has a Registered Capacity of 10MW or more; or
(d) an Offshore Transmission System where such Power Station has a Registered Capacity of 10MW or more;

or,

(B) Embedded within a User System (or part thereof) where such User System (or part thereof) is connected under normal operating conditions to:

(a) NGET’s Transmission System and such Power Station has a Registered Capacity of 100MW or more; or
(b) SPT’s Transmission System and such Power Station has a Registered Capacity of 30MW or more; or
(c) SHETL’s Transmission System and such Power Station has a Registered Capacity of 10MW or more;

or,

(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:

(a) NGET’s Transmission Area where such Power Station has a Registered Capacity of 100MW or more; or
(b) SPT’s Transmission Area where such Power Station has a Registered Capacity of 30MW or more; or
(c) SHETL’s Transmission Area where such Power Station has a Registered Capacity of 10MW or more;

**Licence** Any licence granted to NGET or a Relevant Transmission Licensee or a User, under Section 6 of the Act.

**Licence Standards** Those standards set out or referred to in Condition C17 of NGET’s Transmission Licence and/or Condition D3 and/or Condition E16 of a Relevant Transmission Licensee’s Transmission Licence.

**Limited Frequency Sensitive Mode** A mode whereby the operation of the Genset (or DC Converter at a DC Converter Station 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.

**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.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Load</strong></td>
<td>The <em>Active</em>, <em>Reactive</em> or <em>Apparent Power</em>, as the context requires, generated, transmitted or distributed.</td>
</tr>
<tr>
<td><strong>Loaded</strong></td>
<td>Supplying electrical power to the <em>System</em>.</td>
</tr>
<tr>
<td><strong>Load Factor</strong></td>
<td>The ratio of the actual output of a <em>Generating Unit</em> to the possible maximum output of that <em>Generating Unit</em>.</td>
</tr>
<tr>
<td><strong>Load Management Block</strong></td>
<td>A block of <em>Demand</em> controlled by a <em>Supplier</em> or other party through the means of radio teleswitching or by some other means.</td>
</tr>
</tbody>
</table>
| **Local Joint Restoration Plan**          | A plan produced under OC9.4.7.12 detailing the agreed method and procedure by which a *Genset* at a *Black Start Station* (possibly with other *Gensets* at that *Black Start Station*) will energise part of the *Total System* and meet complementary blocks of local *Demand* so as to form a *Power Island*.  
In Scotland, the plan may also: cover more than one *Black Start Station*; include *Gensets* other than those at a *Black Start Station* and cover the creation of one or more *Power Islands*. |
| **Local Safety Instructions**             | For safety co-ordination in England and Wales, instructions on each *User Site* and *Transmission Site*, approved by the relevant *NGET* or *User's* manager, setting down the methods of achieving the objectives of *NGET'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 his *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*.                                                                                                           |
| **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 *NGET* 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**. |
| **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 voltage 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 Protection** | **Protection** equipment or system expected to have priority in initiating either a fault clearance or an action to terminate an abnormal condition in a power system. |
| **Material Effect** | An effect causing **NGET** 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. |
| **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 Generation Service, MGS** | A service utilised by **NGET** 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 **NGET** for the payment by **NGET** to that **User** in respect of the provision by such **User** of a **Maximum Generation Service**. |
| **Maximum Import 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**. |
Medium Power Station  A Power Station which is
(A) directly connected to NGET’s Transmission System where such Power Station has a Registered Capacity of 50MW or more but less than 100MW;

or,

(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;

or,

(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.

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 can import or export to the Total System under stable operating conditions, as registered with NGET 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 Import Capacity**
The minimum input (in whole MW) into a DC Converter at a DC Converter Station (in any of its operating configurations) at the Onshore Grid Entry Point (or in the case of an Embedded DC Converter at the User System Entry Point) at which a DC Converter can operate in a stable manner, as registered with NGET under the PC (and amended pursuant to the PC).

**Modification**
Any actual or proposed replacement, renovation, modification, alteration or construction by or on behalf of a User or NGET 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 NGET or a User, as the case may be, at a particular Connection Site.

**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 Generating Unit**
A Generating Unit that has previously generated which the Generator plans not to use to generate for the remainder of the current NGET Financial Year but which could be returned to service.

**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.
| **National Demand** | The amount of electricity supplied from the [Grid Supply Points](#) plus:  
| | • that supplied by [Embedded Large Power Stations](#), and  
| | • [National Electricity Transmission System Losses](#), minus:  
| | • the [Demand](#) taken by [Station Transformers](#) and [Pumped Storage Units](#)’s  
| | and, for the purposes of this definition, does not include:  
| | • any exports from the [National Electricity Transmission System](#) across [External Interconnections](#). |
| **National Electricity Transmission System** | The [Onshore Transmission System](#) and [Offshore Transmission Systems](#). |
| **National Electricity Transmission System Demand** | The amount of electricity supplied from the [Grid Supply Points](#) plus:  
| | • that supplied by [Embedded Large Power Stations](#), and  
| | • exports from the [National Electricity Transmission System](#) across [External Interconnections](#), and  
| | • [National Electricity Transmission System Losses](#), and, for the purposes of this definition, includes:  
| | • the [Demand](#) taken by [Station Transformers](#) and [Pumped Storage Units](#). |
| **National Electricity Transmission System Losses** | The losses of electricity incurred on the [National Electricity Transmission System](#). |
| **National Electricity Transmission System Operator Area** | Has the meaning set out in Schedule 1 of [NGET’s Transmission Licence](#). |
| **National Electricity Transmission System Study Network Data File** | A computer file produced by NGET which in NGET’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 NGET’s view of prevailing system conditions. These details, when read together as represented in the file, form NGET’s view of an appropriate representation of the [National Electricity Transmission System](#) for technical analysis purposes only. The file will only deal with the [National Electricity Transmission System](#). |
A warning issued by NGET 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:

(a) alert Users to possible or actual Plant shortage, System problems and/or Demand reductions;

(b) inform of the applicable period;

(c) indicate intended consequences for Users; and

(d) enable specified Users to be in a state of readiness to receive instructions from NGET.

A warning issued by NGET, 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 NGET within 30 minutes.

A warning issued by NGET, 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 inadequate System Margin.

A warning issued by NGET, in accordance with OC7.4.8.5, which is intended to alert recipients of an inadequate System Margin and which if not improved may result in Demand reduction being instructed.

A warning issued by NGET, 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.

The data to be provided by NGET to Users in accordance with the PC, as listed in Part 3 of the Appendix to the PC.

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.
NGET National Grid Electricity Transmission plc (NO: 2366977) whose registered office is at 1-3 Strand, London, WC2N 5EH.

NGET Control Engineer The nominated person employed by NGET to direct the operation of the National Electricity Transmission System or such person as nominated by NGET.

NGET Operational Strategy NGET’s operational procedures which form the guidelines for operation of the National Electricity Transmission System.

No-Load Field Voltage Shall have the meaning ascribed to that term in IEC 34-16-1:1991 [equivalent to British Standard BS4999 Section 116.1 : 1992].

No System Connection As defined in OC8A.1.6.2 and OC8B.1.7.2

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 Generating Unit An Onshore Non-Synchronous Generating Unit or Offshore Non-Synchronous Generating Unit.

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 Generating Unit Unless otherwise provided in the Grid Code, any Apparatus located Offshore which produces electricity, including, an Offshore Synchronous Generating Unit and Offshore Non-Synchronous Generating Unit.
In the case of:-

an Offshore Generating Unit or an Offshore DC 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;

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.

An Offshore Generating Unit that is not an Offshore Synchronous Generating Unit including for the avoidance of doubt a Power Park Unit located Offshore.

A single structure comprising of Plant and Apparatus located Offshore which includes one or more Offshore Grid Entry Points.

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:

a) connect to the same busbar which cannot be electrically split; or
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.

A collection of Offshore Generating Units 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.

An Offshore Generating 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.

An agreement entered into by NGET 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 owned or operated by an Offshore Transmission Licensee 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 and meters owned or operated by any Offshore Transmission Licensee in connection with the transmission of electricity but does not include any Remote Transmission Assets. An Offshore Transmission System extends from the Interface Point the Offshore Grid Entry Point(s) and may include Plant and Apparatus located Onshore and Offshore.

Offshore Waters

Has the meaning given to “offshore waters” in Section 90(9) of the Energy Act 2004.

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 electricity, including, an Onshore Synchronous Generating Unit and Onshore Non-Synchronous Generating Unit.

Onshore Grid Entry Point

A point at which a Onshore Generating Unit or a CCGT Module or a CCGT Unit or a Onshore DC Converter or a Onshore Power Park Module, as the case may be, which is directly connected to the Onshore Transmission System connects to the Onshore Transmission System.

Onshore Non-Synchronous Generating Unit

A Generating Unit located Onshore that is not a Synchronous Generating Unit including for the avoidance of doubt a Power Park Unit located Onshore.
**Onshore Power Park Module**
A collection of **Onshore Generating Units** (registered as a **Power Park Module** under the PC) that are powered by an **Intermittent Power Source**, joined together by a **System** with a single electrical point of connection to the **Onshore Transmission System** (or **User System if Embedded**). The connection to the Onshore Transmission System (or User System if Embedded) may include a DC Converter.

**Onshore Synchronous Generating Unit**
An **Onshore Generating Unit** including, for the avoidance of doubt, a **CCGT 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 Transmission Licensee**
**NGET, SPT, or SHETL.**

**Onshore Transmission System**
The system consisting (wholly or mainly) of high voltage electric lines owned or operated by **Onshore Transmission Licensees** 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**).

**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**, 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 DC Converter** and
**System to Demand** intertripping schemes.

**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**, 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 **NGET's Transmission 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 **NGET**.

**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 in England and Wales, will be to the instruction of NGET and in Scotland and Offshore will be to the instruction of the Relevant Transmission Licensee.

Other Relevant Data  The data listed in BC1.4.2(f) under the heading Other Relevant Data

Out of Synchronism  The condition where a System or Generating Unit cannot meet the requirements to enable it to be Synchronised.

Output Usable or OU  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 Genset can export to the Grid Entry Point, or in the case of Embedded Power Stations, to the User System Entry Point.

Over-excitation Limiter  Shall have the meaning ascribed to that term in IEC 34-16-1:1991 [equivalent to British Standard BS4999 Section 116.1 : 1992].

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. An exhaustive list of Part 1 System Ancillary Services is included in that part of CC.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 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.

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.

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.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Partial Shutdown</strong></td>
<td>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 NGET's directions relating to a Black Start.</td>
</tr>
<tr>
<td><strong>Phase (Voltage) Unbalance</strong></td>
<td>The ratio (in percent) between the rms values of the negative sequence component and the positive sequence component of the voltage.</td>
</tr>
<tr>
<td><strong>Physical Notification</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Planning Code or PC</strong></td>
<td>That portion of the Grid Code which is identified as the Planning Code.</td>
</tr>
<tr>
<td><strong>Planned Maintenance Outage</strong></td>
<td>An outage of NGET electronic data communication facilities as provided for in CC.6.5.8 and NGET'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 NGET 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 NGET to the User. It is anticipated that normally any planned outage would only last around one hour.</td>
</tr>
<tr>
<td><strong>Planned Outage</strong></td>
<td>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 NGET under OC2.</td>
</tr>
<tr>
<td><strong>Plant</strong></td>
<td>Fixed and movable items used in the generation and/or supply and/or transmission of electricity, other than Apparatus.</td>
</tr>
<tr>
<td><strong>Point of Common Coupling</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Point of Connection</strong></td>
<td>An electrical point of connection between the National Electricity Transmission System and a User's System.</td>
</tr>
<tr>
<td><strong>Point of Isolation</strong></td>
<td>The point on Apparatus (as defined in OC8A.1.6.2 and OC8B.1.7.2) at which Isolation is achieved.</td>
</tr>
<tr>
<td><strong>Post-Control Phase</strong></td>
<td>The period following real time operation.</td>
</tr>
<tr>
<td><strong>Power Factor</strong></td>
<td>The ratio of Active Power to Apparent Power.</td>
</tr>
<tr>
<td><strong>Power Island</strong></td>
<td><strong>Gensets</strong> at an isolated <strong>Power Station</strong>, together with complementary local <strong>Demand</strong>. In Scotland a <strong>Power Island</strong> may include more than one <strong>Power Station</strong>.</td>
</tr>
<tr>
<td>------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Power Park Module</strong></td>
<td><strong>Any Onshore Power Park Module</strong> or <strong>Offshore Power Park Module</strong>.</td>
</tr>
<tr>
<td><strong>Power Park Module Availability Matrix</strong></td>
<td>The matrix described in Appendix 1 to BC1 under the heading <strong>Power Park Module Availability Matrix</strong>.</td>
</tr>
<tr>
<td><strong>Power Park Module Planning Matrix</strong></td>
<td>A matrix in the form set out in Appendix 4 of OC2 showing the combination of <strong>Power Park Units</strong> within a <strong>Power Park Module</strong> which would be expected to be running under normal conditions.</td>
</tr>
<tr>
<td><strong>Power Park Unit</strong></td>
<td>A <strong>Generating Unit</strong> within a <strong>Power Park Module</strong>.</td>
</tr>
<tr>
<td><strong>Power Station</strong></td>
<td>An installation comprising one or more <strong>Generating Units</strong> or <strong>Power Park Modules</strong> (even where sited separately) owned and/or controlled by the same <strong>Generator</strong>, which may reasonably be considered as being managed as one <strong>Power Station</strong>.</td>
</tr>
<tr>
<td><strong>Power System Stabiliser or PSS</strong></td>
<td>Equipment controlling the <strong>Exciter</strong> 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).</td>
</tr>
<tr>
<td><strong>Preface</strong></td>
<td>The preface to the <strong>Grid Code</strong> (which does not form part of the <strong>Grid Code</strong> and therefore is not binding).</td>
</tr>
<tr>
<td><strong>Preliminary Notice</strong></td>
<td>A notice in writing, sent by <strong>NGET</strong> both to all <strong>Users</strong> identified by it under OC12.4.2.1 and to the <strong>Test Proposer</strong>, notifying them of a proposed <strong>System Test</strong>.</td>
</tr>
<tr>
<td><strong>Preliminary Project Planning Data</strong></td>
<td>Data relating to a proposed <strong>User Development</strong> at the time the <strong>User</strong> applies for a <strong>CUSC Contract</strong> but before an offer is made and accepted.</td>
</tr>
</tbody>
</table>
**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.

**Programming Phase**  The period between 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 NGET by a User which would like to undertake a System Test.

**Proposal Report**  A report submitted by the Test Panel which contains:

a) proposals for carrying out a System Test (including the manner in which the System Test is to be monitored);

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

c) such other matters as the Test Panel considers appropriate.

The report may include requirements for indemnities to be given in respect of claims and losses arising from a System Test.

**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 Generator**  A Generator which owns and/or operates any Pumped Storage Plant.

**Pumped Storage Plant**  The Dinorwig, Ffestiniog, Cruachan and Foyers Power Stations.

**Pumped Storage Unit**  A Generating Unit within a Pumped Storage Plant.
**Quiescent Physical Notification or QPN**
Data that describes the MW levels to be deducted from the Physical Notification of a BM Unit to determine a resultant operating level to which the Dynamic Parameters associated with that BM Unit apply, and the associated times for such MW levels. The MW level of the QPN must always be set to zero.

**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 BS4999 Section 116.1 : 1992].

**Rated MW**
The “rating-plate” MW output of a Generating Unit, Power Park Module or DC Converter, being:

(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

(b) the nominal rating for the MW output of a Power Park Module being the maximum continuous electric output power which the Power Park Module was designed to achieve under normal operating conditions; or

(c) the nominal rating for the MW import capacity and export capacity (if at a DC Converter Station) of a DC Converter.

**Reactive Despatch Instruction**
Has the meaning set out in the CUSC

**Reactive Despatch Network Restriction**
A restriction placed upon an Embedded Generating Unit, Embedded Power Park Module or DC Converter at an Embedded DC Converter Station by the Network Operator that prevents the Generator or DC Converter Station owner in question (as applicable) from complying with any Reactive Despatch Instruction with respect to that Generating Unit, Power Park Module or DC Converter at a DC Converter Station, whether to provide Mvars over the range referred to in CC 6.3.2 or otherwise.

**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:

\[ 1000 \text{ VAr} = 1 \text{ kVAr} \]
\[ 1000 \text{ kVAr} = 1 \text{ Mvar} \]
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.
Registered Capacity

(a) In the case of a Generating Unit other than that forming part of a CCGT Module or Power Park 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).

(b) In the case of a CCGT Module or Power Park Module, the normal full load capacity of the CCGT Module or Power Park Module (as the case may be) as declared by the Generator, being the Active Power declared by the 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.

(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 Generating Units and/or CCGT Modules and/or Power Park Modules less the MW consumed by the Generating Units and/or CCGT Modules in producing that Active Power.

(d) In the case of a DC Converter at a DC Converter Station, the normal full load amount of Active Power transferable from a DC Converter at the Onshore Grid Entry Point (or in the case of an Embedded DC Converter Station at the User System Entry Point), as declared by the DC Converter Station owner, expressed in whole MW, or in MW to one decimal place.

(e) In the case of a DC Converter Station, the maximum amount of Active Power transferable from a DC Converter Station at the Onshore Grid Entry Point (or in the case of an Embedded DC Converter Station at the User System Entry Point), as declared by the DC Converter Station owner, expressed in whole MW, or in MW to one decimal place.

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 containing DC Converters connected to an External System, the maximum amount of Active Power transferable into a DC Converter Station at the Onshore Grid Entry Point (or in the case of an Embedded DC Converter Station at the User System Entry Point), as declared by the DC Converter Station owner, expressed in whole MW.

In the case of a DC Converter connected to an External System and in a DC Converter Station, the normal full load amount of Active Power transferable into a DC Converter at the Onshore Grid Entry Point (or in the case of an Embedded DC Converter Station at the User System Entry Point), as declared by the DC Converter owner, expressed in whole MW.
**Regulations**

The Utilities Contracts Regulations 1996, as amended from time to time.

**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.

**Relevant E&W Transmission Licensee**

As the context requires **NGET** and/or an **E&W Offshore Transmission Licensee**

**Relevant Scottish Transmission Licensee**

As the context requires **SPT** and/or **SHETL** and/or a **Scottish Offshore Transmission Licensee**

**Relevant Transmission Licensee**

Means **SP Transmission Ltd (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**.

**Relevant Unit**

As defined in the **STC**, Schedule 3

**Remote Transmission Assets**

Any **Plant** and **Apparatus** or meters owned by **NGET** which:

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

b) are by agreement between **NGET** and such **User** operated under the direction and control of such **User**.

**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 **NGET** to sign **Site Responsibility Schedules** on behalf of that **User** or **NGET**, as the case may be.

For **Connection Sites** in Scotland and **Offshore** a manager who has been duly authorised by the **Relevant Transmission Licensee** to sign **Site Responsibility Schedules** on behalf of that **Relevant Transmission Licensee**.
**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.

**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** on an **E&W Transmission System** and/or by the **Relevant Scottish Transmission Licensee** and each **Scottish User** in relation to **Connection Points** on a **Scottish Transmission System** to be responsible for the co-ordination of **Safety Precautions** at each **Connection Point** 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**.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety From The System</td>
<td>That condition which safeguards persons when work is to be carried out on or near a <strong>System</strong> from the dangers which are inherent in the <strong>System</strong>.</td>
</tr>
<tr>
<td>Safety Key</td>
<td>A key unique at the <strong>Location</strong> capable of operating a lock which will cause an <strong>Isolating Device</strong> and/or <strong>Earthing Device</strong> to be <strong>Locked</strong>.</td>
</tr>
<tr>
<td>Safety Log</td>
<td>A chronological record of messages relating to safety co-ordination sent and received by each <strong>Safety Co-ordinator</strong> under <strong>OC8</strong>.</td>
</tr>
<tr>
<td>Safety Precautions</td>
<td><strong>Isolation</strong> and/or <strong>Earthing</strong>.</td>
</tr>
<tr>
<td>Safety Rules</td>
<td>The rules of <strong>NGET</strong> (in England and Wales) and the <strong>Relevant Transmission Licensee</strong> (in Scotland or <strong>Offshore</strong>) or a <strong>User</strong> that seek to ensure that persons working on <strong>Plant</strong> and/or <strong>Apparatus</strong> to which the rules apply are safeguarded from hazards arising from the <strong>System</strong>.</td>
</tr>
<tr>
<td>Scottish Offshore Transmission System</td>
<td>An <strong>Offshore Transmission System</strong> with an <strong>Interface Point</strong> in Scotland.</td>
</tr>
<tr>
<td>Scottish Offshore Transmission Licensee</td>
<td>A person who owns or operates a <strong>Scottish Offshore Transmission System</strong> pursuant to a <strong>Transmission Licence</strong>.</td>
</tr>
<tr>
<td>Scottish Transmission System</td>
<td>Collectively <strong>SPT’s Transmission System</strong> and <strong>SHETL’s Transmission System</strong> and any <strong>Scottish Offshore Transmission Systems</strong></td>
</tr>
<tr>
<td>Scottish User</td>
<td>A <strong>User</strong> in Scotland or any <strong>Offshore User</strong> who owns or operates <strong>Plant</strong> and/or <strong>Apparatus</strong> connected to a <strong>Scottish Offshore Transmission System</strong></td>
</tr>
<tr>
<td>Secondary Response</td>
<td>The automatic increase in <strong>Active Power</strong> output of a <strong>Genset</strong> or, as the case may be, the decrease in <strong>Active Power Demand</strong> in response to a <strong>System Frequency</strong> fall. This increase in <strong>Active Power</strong> output or, as the case may be, the decrease in <strong>Active Power Demand</strong> must be in accordance with the provisions of the relevant <strong>Ancillary Services Agreement</strong> which will provide that it will be fully available by 30 seconds from the time of the start of the <strong>Frequency</strong> fall and be sustainable for at least a further 30 minutes. The interpretation of the <strong>Secondary Response</strong> to a -0.5 Hz frequency change is shown diagrammatically in Figure CC.A.3.2.</td>
</tr>
<tr>
<td>Secretary of State</td>
<td>Has the same meaning as in the <strong>Act</strong>.</td>
</tr>
<tr>
<td><strong>Secured Event</strong></td>
<td>Has the meaning set out in the <em>Security and Quality of Supply Standard</em>.</td>
</tr>
<tr>
<td>-------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Security and Quality of Supply Standard</strong></td>
<td>The version of the document entitled ‘Security and Quality of Supply Standard’ established pursuant to the <em>Transmission Licence</em> in force at the time of entering into the relevant <em>Bilateral Agreement</em>.</td>
</tr>
<tr>
<td><strong>Setpoint Voltage</strong></td>
<td>The value of voltage at the <em>Grid Entry Point</em>, or <em>User System Entry Point</em> if <em>Embedded</em>, on the automatic control system steady state operating characteristic, as a percentage of the nominal voltage, at which the transfer of <em>Reactive Power</em> between a <em>Power Park Module</em>, <em>DC Converter</em> or <em>Non-Synchronous Generating Unit</em> and the <em>Transmission System</em>, or <em>Network Operator’s system</em> if <em>Embedded</em>, is zero.</td>
</tr>
<tr>
<td><strong>Settlement Period</strong></td>
<td>A period of 30 minutes ending on the hour and half-hour in each hour during a day.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
</tr>
<tr>
<td>------</td>
<td>------------</td>
</tr>
<tr>
<td><strong>Seven Year Statement</strong></td>
<td>A statement, prepared by NGET in accordance with the terms of NGET's Transmission Licence, showing for each of the seven 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.</td>
</tr>
<tr>
<td><strong>SF₆ Gas Zone</strong></td>
<td>A segregated zone surrounding electrical conductors within a casing containing SF₆ gas.</td>
</tr>
<tr>
<td><strong>SHETL</strong></td>
<td>Scottish Hydro-Electric Transmission Limited</td>
</tr>
<tr>
<td><strong>Shutdown</strong></td>
<td>The condition of a Generating Unit where the generator rotor is at rest or on barring.</td>
</tr>
<tr>
<td><strong>Significant Incident</strong></td>
<td>An Event which either:</td>
</tr>
<tr>
<td>a)</td>
<td>was notified by a User to NGET under OC7, and which NGET considers has had or may have had a significant effect on the National Electricity Transmission System, and NGET requires the User to report that Event in writing in accordance with OC10 and notifies the User accordingly; or</td>
</tr>
<tr>
<td>b)</td>
<td>was notified by NGET 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 NGET to report that Event in writing in accordance with the provisions of OC10 and notifies NGET accordingly.</td>
</tr>
<tr>
<td><strong>Simultaneous Tap Change</strong></td>
<td>A tap change implemented on the generator step-up transformers of Synchronised Gensets, effected by Generators in response to an instruction from NGET 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 NGET of the instruction.</td>
</tr>
<tr>
<td><strong>Single Line Diagram</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Single Point of Connection</strong></td>
<td>A single Point of Connection, with no interconnection through the User's System to another Point of Connection.</td>
</tr>
<tr>
<td><strong>Site Common Drawings</strong></td>
<td>Drawings prepared for each Connection Site which incorporate Connection Site layout drawings, electrical layout drawings, common protection/ control drawings and common services drawings.</td>
</tr>
</tbody>
</table>
**Site Responsibility**

A schedule containing the information and prepared on the basis of the provisions set out in Appendix 1 of the CC.

**Schedule**

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 Power Station**

A Power Station which is

(A) directly connected to:

(a) NGET's Transmission System where such Power Station has a Registered Capacity of less than 50MW; or
(b) SPT's Transmission System where such Power Station has a Registered Capacity of less than 30MW; or
(c) SHETL's Transmission System where such a Power Station has a Registered Capacity of less than 10 MW; or
(d) an Offshore Transmission System where such Power Station has a Registered Capacity of less than 10MW;

or,

(B) Embedded within a User System (or part thereof) where such User System (or part thereof) is connected under normal operating conditions to:

(a) NGET's Transmission System and such Power Station has a Registered Capacity of less than 50MW; or
(b) SPT's Transmission System and such Power Station has a Registered Capacity of less than 30MW; or
(c) SHETL's Transmission System and such Power Station has a Registered Capacity of less than 10MW;

or,

(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:

(a) NGET's Transmission Area and such Power Station has a Registered Capacity of less than 50MW; or
(b) SPT's Transmission Area and such Power Station has a Registered Capacity of less than 30MW; or
(c) SHETL's Transmission Area and such Power Station has a Registered Capacity of less than 10MW;

**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

**Standard Planning Data**

The general data required by NGET under the PC. It is generally also the data which NGET requires from a new User in an application for a C USC Contract, as reflected in the PC.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Start Time</strong></td>
<td>The time named as such in an instruction issued by NGET pursuant to the BCs.</td>
</tr>
<tr>
<td><strong>Start-Up</strong></td>
<td>The action of bringing a Generating Unit from Shutdown to Synchronous Speed.</td>
</tr>
<tr>
<td><strong>Statement of Readiness</strong></td>
<td>Has the meaning set out in the Bilateral Agreement and/or Construction Agreement.</td>
</tr>
<tr>
<td><strong>Station Board</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>Station Transformer</strong></td>
<td>A transformer supplying electrical power to the Auxiliaries of • a Power Station, which is not directly connected to the Generating Unit terminals (typical voltage ratios being 132/11kV or 275/11kV), or • a DC Converter Station.</td>
</tr>
<tr>
<td><strong>STC Committee</strong></td>
<td>The committee established under the STC.</td>
</tr>
<tr>
<td><strong>Steam Unit</strong></td>
<td>A Generating Unit whose prime mover converts the heat-energy in steam to mechanical energy.</td>
</tr>
<tr>
<td><strong>Subtransmission System</strong></td>
<td>The part of a User's System which operates at a single transformation below the voltage of the relevant Transmission System.</td>
</tr>
<tr>
<td><strong>Supergrid Voltage</strong></td>
<td>Any voltage greater than 200kV.</td>
</tr>
<tr>
<td><strong>Supplier</strong></td>
<td>(a) A person supplying electricity under an Electricity Supply Licence; or (b) A person supplying electricity under exemption under the Act; in each case acting in its capacity as a supplier of electricity to Customers in Great Britain.</td>
</tr>
</tbody>
</table>
**Surplus**

A MW figure relating to a **System Zone** equal to the total **Output Usable** in the **System Zone**:

a) minus the forecast of **Active Power Demand** in the **System Zone**, and

b) minus the export limit in the case of an export limited **System Zone**, or

plus the import limit in the case of an import limited **System Zone**, and

c) (only in the case of a **System Zone** comprising the **National Electricity Transmission System**) minus the **Operational Planning Margin**.

For the avoidance of doubt, a **Surplus** of more than zero in an export limited **System Zone** indicates an excess of generation in that **System Zone**; and a **Surplus** of less than zero in an import limited **System Zone** indicates insufficient generation in that **System Zone**.

**Synchronised**

a) The condition where an incoming **Generating Unit or Power Park Module or DC Converter or System** is connected to the busbars of another **System** so that the **Frequencies** and phase relationships of that **Generating Unit, Power Park Module, DC 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”.

b) The condition where an importing **BM Unit** is consuming electricity.

**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 Compensation**

The operation of rotating synchronous **Apparatus** for the specific purpose of either the generation or absorption of **Reactive Power**.

**Synchronous Generating Unit**

Any **Onshore Synchronous Generating Unit or Offshore Synchronous Generating Unit**.

**Synchronous Speed**

That speed required by a **Generating Unit** to enable it to be **Synchronised** to a **System**.
<table>
<thead>
<tr>
<th><strong>System</strong></th>
<th>Any User System and/or the National Electricity Transmission System, as the case may be.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System Ancillary Services</strong></td>
<td>Collectively Part 1 System Ancillary Services and Part 2 System Ancillary Services.</td>
</tr>
<tr>
<td><strong>System Constraint</strong></td>
<td>A limitation on the use of a System due to lack of transmission capacity or other System conditions.</td>
</tr>
<tr>
<td><strong>System Constrained Capacity</strong></td>
<td>That portion of Registered Capacity or Registered Import Capacity not available due to a System Constraint.</td>
</tr>
<tr>
<td><strong>System Constraint Group</strong></td>
<td>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.</td>
</tr>
</tbody>
</table>
| **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: 

\[ Dp = 1 - \frac{F_1}{A} \]

Where: 
- \( A \) = Total number of System faults 
- \( F_1 \) = Number of System faults where there was a failure to trip a circuit-breaker. |
| **System Margin** | The margin in any period between 
(a) the sum of Maximum Export Limits and 
(b) forecast Demand and the Operating Margin, 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 NGET’s Transmission Licence |
**System Telephony**
An alternative method by which a **User’s Responsible Engineer/Operator** and NGET **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) 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 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 **Category 4 Intertripping Scheme**.

**System Zone**
A region of the **National Electricity Transmission System** within a described boundary or the whole of the **National Electricity Transmission System**, as further provided for in OC2.2.4, and the term "Zonal" will be construed accordingly.

**Target Frequency**
That **Frequency** determined by **NGET**, in its reasonable opinion, as the desired operating **Frequency** of the **Total System**. This will normally be 50.00Hz plus or minus 0.05Hz, except in exceptional circumstances as determined by **NGET**, in its reasonable opinion when this may be 49.90 or 50.10Hz. An example of exceptional circumstances may be difficulties caused in operating the **System** during disputes affecting fuel supplies.

**Technical Specification**
In relation to **Plant** and/or **Apparatus**,

a) the relevant **European Specification**; or

b) if there is no relevant **European Specification**, other relevant standards which are in common use in the European Community.

**Test Co-ordinator**
A person who co-ordinates **System Tests**.
<p>| <strong>Test Panel</strong> | A panel, whose composition is detailed in OC12, which is responsible, inter alia, for considering a proposed <strong>System Test</strong>, and submitting a <strong>Proposal Report</strong> and a <strong>Test Programme</strong>. |
| <strong>Test Programme</strong> | A programme submitted by the <strong>Test Panel</strong> to NGET, the <strong>Test Proposer</strong>, and each <strong>User</strong> identified by NGET 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 <strong>System Test</strong> (including those responsible for the site safety) and such other matters as the <strong>Test Panel</strong> deems appropriate. |
| <strong>Test Proposer</strong> | The person who submits a <strong>Proposal Notice</strong>. |
| <strong>Total Shutdown</strong> | The situation existing when all generation has ceased and there is no electricity supply from <strong>External Interconnections</strong> and, therefore, the <strong>Total System</strong> has shutdown with the result that it is not possible for the <strong>Total System</strong> to begin to function again without NGET’s directions relating to a <strong>Black Start</strong>. |
| <strong>Total System</strong> | The <strong>National Electricity Transmission System</strong> and all <strong>User Systems</strong> in the <strong>National Electricity Transmission System Operator Area</strong>. |
| <strong>Trading Point</strong> | A commercial and, where so specified in the <strong>Grid Code</strong>, an operational interface between a <strong>User</strong> and NGET, which a <strong>User</strong> has notified to <strong>NGET</strong>. |
| <strong>Transfer Date</strong> | Such date as may be appointed by the <strong>Secretary of State</strong> by order under section 65 of the <strong>Act</strong>. |
| <strong>Transmission</strong> | 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 <strong>National Electricity Transmission System</strong>, and not of or with the <strong>User System</strong>. |
| <strong>Transmission Area</strong> | Has the meaning set out in the <strong>Transmission Licence</strong> of a <strong>Transmission Licensee</strong>. |
| <strong>Transmission DC Converter</strong> | Any <strong>Transmission Licensee Apparatus</strong> used to convert alternating current electricity to direct current electricity, or vice versa. A <strong>Transmission Network DC Converter</strong> 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. |
| <strong>Transmission Entry Capacity</strong> | Has the meaning set out in the <strong>CUSC</strong>. |</p>
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission Interface Circuit</td>
<td>In <strong>NGET’s Transmission Area</strong>, a <strong>Transmission</strong> circuit which connects a <strong>System</strong> operating at a voltage above 132kV to a <strong>System</strong> operating at a voltage of 132kV or below. In <strong>SHETL’s Transmission Area</strong> and <strong>SPT’s Transmission Area</strong>, a <strong>Transmission</strong> circuit which connects a <strong>System</strong> operating at a voltage of 132kV or above to a <strong>System</strong> operating at a voltage below 132kV.</td>
</tr>
<tr>
<td>Transmission Licence</td>
<td>A licence granted under Section 6(1)(b) of the <strong>Act</strong>.</td>
</tr>
<tr>
<td>Transmission Licensee</td>
<td>Any <strong>Onshore Transmission Licensee</strong> or <strong>Offshore Transmission Licensee</strong>.</td>
</tr>
<tr>
<td>Transmission Site</td>
<td>In England and Wales, means a site owned (or occupied pursuant to a lease, licence or other agreement) by <strong>NGET</strong> in which there is a <strong>Connection Point</strong>. For the avoidance of doubt, a site owned by a <strong>User</strong> but occupied by <strong>NGET</strong> as aforesaid, is a <strong>Transmission Site</strong>. In Scotland and <strong>Offshore</strong>, means a site owned (or occupied pursuant to a lease, licence or other agreement) by a <strong>Relevant Transmission Licensee</strong> in which there is a <strong>Connection Point</strong>. For the avoidance of doubt, a site owned by a <strong>User</strong> but occupied by the <strong>Relevant Transmission Licensee</strong> as aforesaid, is a <strong>Transmission Site</strong>.</td>
</tr>
<tr>
<td>Transmission System</td>
<td>Has the same meaning as the term &quot;licensee's transmission system&quot; in the <strong>Transmission Licence</strong> of a <strong>Transmission Licensee</strong>.</td>
</tr>
<tr>
<td>Turbine Time Constant</td>
<td>Determined at <strong>Registered Capacity</strong>, the turbine time constant will be construed in accordance with the principles of the IEEE Committee Report &quot;Dynamic Models for Steam and Hydro Turbines in Power System Studies&quot; published in 1973 which apply to such phrase.</td>
</tr>
<tr>
<td>Two Shifting Limit</td>
<td>The maximum number of times in any <strong>Operational Day</strong> that a <strong>Genset</strong> may <strong>De-Synchronise</strong>.</td>
</tr>
<tr>
<td>Unbalanced Load</td>
<td>The situation where the <strong>Load</strong> on each phase is not equal.</td>
</tr>
<tr>
<td>Under-excitation Limiter</td>
<td>Shall have the meaning ascribed to that term in <strong>IEC 34-16-1:1991</strong> [equivalent to <strong>British Standard BS4999 Section 116.1 : 1992</strong>].</td>
</tr>
<tr>
<td>Under Frequency Relay</td>
<td>An electrical measuring relay intended to operate when its characteristic quantity (<strong>Frequency</strong>) reaches the relay settings by decrease in <strong>Frequency</strong>.</td>
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**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.

**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.

**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.

**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 Site**
In England and Wales, 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 NGET but occupied by a User as aforesaid, is a User Site.

In Scotland and Offshore, 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.
**User System**

Any system owned or operated by a **User** comprising:-

(a) **Generating Units**; and/or

(b) Systems consisting (wholly or mainly) of electric lines used for the distribution of electricity from **Grid Supply Points** or **Generating Units** or other entry points to the point of delivery to **Customers**, or other **Users**;

and **Plant** and/or **Apparatus** connecting:-

(c) The system as described above; or

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

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 a **Generating Unit**, a **CCGT Module** or a **CCGT Unit** or a **Power Park Module** or a **DC Converter**, as the case may be, which is **Embedded** connects to the **User System**.

**Water Time Constant**

Bears the meaning ascribed to the term "Water inertia time" in IEC308.
**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.

**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.

A number of the terms listed above are defined in other documents, such as the Balancing and Settlement Code and the Transmission Licence. Appendix 1 sets out the current definitions from the other documents of those terms so used in the Grid Code and defined in other documents for ease of reference, but does not form part of the Grid Code.
2. Construction of References

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 NGET'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, 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.

< End of GD >
## PLANNING CODE

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PLANNING CODE

PC.1 INTRODUCTION

PC.1.1 The Planning Code ("PC") specifies the technical and design criteria and procedures to be applied by NGET 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. It details information to be supplied by Users to NGET, and certain information to be supplied by NGET to Users. In Scotland and Offshore, NGET 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, NGET may pass on User data to a Relevant Transmission Licensee, as detailed in PC.3.4 and PC.3.5.

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;

(b) on transmission lines or other facilities which join that Connection Site 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.

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.
PC.2 OBJECTIVE

The objectives of the PC are:

(a) to promote NGET/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 NGET 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 NGET to Users in relation to short circuit current contributions; 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 NGET from Users in respect of the following to enable NGET to carry out its duties under the Act and the Transmission Licence:

(i) Mothballed Generating Units; and

(ii) capability of gas-fired Generating Units to run using alternative fuels.

NGET will use the information provided under PC2.1(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, NGET may publish the information. Where it is known by NGET that such information is intended for wider publication the information provided under PC2.1(d) shall be aggregated such that individual data items should not be identifiable.

PC.3 SCOPE

The PC applies to NGET and to Users, which in the PC means:

(a) Generators;

(b) Network Operators;

(c) Non-Embedded Customers; and

(d) DC Converter Station 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 Stations and Embedded DC Converter Stations, 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 NGET 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 shall provide the data direct to NGET in respect of Embedded DC Converter Stations subject to a Bilateral Agreement;

(c) each Network Operator shall provide the data to NGET 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 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 under this PC, each Network Operator in whose System they are Embedded should provide the data (contained in the Appendix) to NGET in respect of Embedded Small Power Stations or Embedded installations of direct current converters which do not form a DC Converter Station 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 NGET 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 or Embedded DC Converter Stations, 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 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
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** 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** are treated as **Onshore Generators** or **Onshore DC Converter Station** owners connected to an **Onshore User System Entry Point**.

**PC.3.4**

**NGET** may provide to the **Relevant Transmission Licensees** any data which has been submitted to **NGET** by any **Users** pursuant to the following paragraphs of the **PC**. For the avoidance of doubt, **NGET** 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.3.5**

In addition to the provisions of **PC.3.4** **NGET** may provide to the **Relevant Transmission Licensees** any data which has been submitted to **NGET** by any **Users** in respect of **Relevant Units** pursuant to the following paragraphs of the **PC**.
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 NGET and such Offshore Embedded Power Station.

PC.4 PLANNING PROCEDURES

PC.4.1 Pursuant to Condition C11 of NGET’s Transmission 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 NGET under its Transmission Licence, showing for each of the seven 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 “Seven Year Statement”); and

(b) an offer, in accordance with its Transmission Licence, by NGET 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) 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 and for Embedded DC Converter Stations) with effect from the Transfer Date;

(iii) a Modification at a Connection Site (or in relation to the connection of certain Embedded Power Stations and for Embedded DC Converter Stations 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**

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**) 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**) 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 **NGET** in relation to short circuit current contributions.

**PC.4.3** *Data Provision*

**PC.4.3.1** *Seven Year Statement*

To enable the **Seven Year Statement** to be prepared, each **User** is required to submit to **NGET** (subject to the provisions relating to **Embedded Power**
Stations and Embedded DC Converter Stations in PC.3.2) both the Standard Planning Data and the Detailed Planning Data as listed in parts 1 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 each of the seven succeeding Financial Years (and in certain instances, the current year). 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, NGET 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, in the preparation of the Seven 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, NGET 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.4.4 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 to be connected to the National Electricity Transmission System or of the Modification relating to the User's Plant and/or Apparatus 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; 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 NGET 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. 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. Within 28 days (or such longer period as NGET may agree in any particular case) of acceptance of the offer the User shall supply the Detailed Planning Data pertaining to the User Development as listed in Part 2 of the Appendix.

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 NGET, the relevant Detailed Planning Data as listed in Part 2 of the Appendix.

PC.4.4.4 Within 28 days (or such longer period as NGET may agree in any particular case) of entry into the Embedded Development Agreement the Network Operator shall supply the Detailed Planning Data pertaining to the Embedded Development as listed in Part 2 of the Appendix.

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 NGET 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 NGET 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 NGET 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 NGET to carry out any of the above mentioned necessary detailed system studies, the User may, at the request of NGET, 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 NGET can reasonably demonstrate that it is relevant and necessary.

PC.4.5.3 To enable NGET to carry out any necessary detailed system studies, the relevant Network Operator may, at the request of NGET, 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 NGET 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 NGET 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 NGET under this PC, will become Committed Project Planning Data. Once an Embedded Person has entered into an Embedded Development Agreement, as notified to NGET by the Network Operator, the data relating to the Embedded Development already submitted as Preliminary Project Planning Data, and subsequent data required by NGET 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 NGET 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 NGET:
(a) is obliged to use it in the preparation of the **Seven Year Statement** and in any further information given pursuant to the **Seven 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 **NGET**'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 **STC**.

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 seven 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
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 seven 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 **NGET** 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 **NGET**:

(a) is obliged to use it in the preparation of the **Seven Year Statement** and in any further information given pursuant to the **Seven 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 **NGET**'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**.

**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**

**NGET** shall apply the **Licence Standards** relevant to planning and development, in the planning and development of its **Transmission System**. **NGET** 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**.
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 NGET on request. NGET 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 NGET on request. NGET will charge an amount sufficient to recover its reasonable costs incurred in providing this service.

PC.7 PLANNING LIAISON

PC.7.1 This PC.7 applies to NGET 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 NGET 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 NGET 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 NGET 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 NGET 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 NGET 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 NGET 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 NGET from the earlier fulfilment of the new requirements prior to the specified years. Where NGET 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 NGET 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 NGET 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 NGET 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 NGET 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.7.5.

PC.7.6 Following any notification by NGET to a User pursuant to PC.7.4 and following any further discussions held between the User and NGET:
   i) NGET 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 NGET that is to NGET's reasonable satisfaction; and/or,
       b) modify data previously submitted pursuant to this PC, such modified data to be to NGET's reasonable satisfaction; and/or
       c) notify NGET that it is the intention of the User to leave the data as originally submitted to NGET to stand as its submission.

PC.7.7 Where an Access Period is amended pursuant to PC.7.5 (i) NGET 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 NGET with viable User network data (as required under this PC). Upon receipt of such request NGET shall consider, and where appropriate provide such National Electricity Transmission System network data to the User as soon as reasonably practicable following the request.
APPENDIX A

PLANNING DATA REQUIREMENTS

PC.A.1. INTRODUCTION

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

Submissions by Users

PC.A.1.2 (a) Planning data submissions by Users shall be:

(i) with respect to each of the seven 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). 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 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 NGET under the PC, notwithstanding that the change may subsequently be notified to NGET 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 NGET 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 (except as provided in PC.3.2.(c)), or unless specifically requested by NGET, or unless otherwise specifically provided.

PC.A.1.3 Submissions by NGET

Network Data release by NGET shall be:

(a) with respect to the current Financial Year;

(b) provided by NGET 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, NGET 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 three 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 NGET 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).

(b) Detailed Planning Data

This data (as listed in Part 2 of the Appendix) is usually first to be provided by the User within 28 days (or such longer period as NGET may agree in any particular case) of the offer for a CUSC Contract, being accepted by the User. In the case of an Embedded Development this data (as listed in Part 2 of the Appendix) is usually first to be provided by the relevant Network Operator within 28 days (or such longer period as NGET may agree in any particular case) of entry into the Embedded Development Agreement. It comprises additional, more detailed, data not normally expected to be required by NGET 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, although not needed within 28 days of the offer or entry into the Embedded Development Agreement, as the case may be, the term Detailed Planning Data also includes Operation Diagrams and Site Common Drawings produced in accordance with the CC.

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

(c) Network Data
The data requirements for NGET in this Appendix are in Part 3.

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
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.

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.

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 Licences, the STC and the Grid Code, and on which NGET therefore relies. In following the processes set out in the BCs, NGET will use the data which has been supplied to it under the BCs 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.

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.

Certain data does not need to be supplied in relation to Embedded Power Stations or Embedded DC Converter Stations 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 NGET.
PART 1
STANDARD PLANNING DATA

PC.A.2 USER'S SYSTEM 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 NGET, shall provide NGET with data on its User System which relates to the Connection Site 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 NGET 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, or Network Operator in the case of Embedded DC Converter Stations not subject to a Bilateral Agreement, connected to the Subtransmission System shall provide NGET 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 or Embedded DC Converter Station with a Registered Capacity of less than 100MW or an Embedded installation of direct current converters which does not form a DC Converter Station in its User System may, at NGET'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 or Embedded DC Converter Station or Embedded installation of direct current converters which does not form a DC Converter Station.

PC.A.2.1.4 At NGET's reasonable request, additional data on the User's System 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 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.

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, and those parts of its Subtransmission System at any Transmission Site. In addition, the Single Line Diagram must
include all parts of the **User's Subtransmission System** throughout **Great Britain** operating at a voltage greater than 50kV, and, in Scotland and **Offshore**, also all parts of the **User's Subtransmission System** 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 **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** not already included above, and also details of the transformers connecting the **User's Subtransmission System** to a lower voltage. With **NGET's** agreement, the **Single Line Diagram** can also contain information about the **User's System** at a voltage below the voltage of the **Subtransmission System**.

The **Single Line Diagram** for a **Power Park Module** 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** 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 (ie. 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, 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.
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**:

**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** 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.

PC.A.2.2.5 For each transformer shown on the **Single Line Diagram** provided under PC.A.2.2.1, each **User** 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 between the **User's 132kV System** and the **User's Subtransmission System** 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**:-

(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)

(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.2.3 Lumped System Susceptance

PC.A.2.3.1 For all parts of the User's Subtransmission System 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 that shown on the Single Line Diagram, not operated by NGET and connected to the User's System at 132kV and above in England and Wales and 33kV and above in Scotland and Offshore, other than power factor correction equipment associated directly with Customers' Plant and Apparatus, the following information is required:
(a) type of equipment (e.g. 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 in terms of electrical location and System voltage.

PC.A.2.4.2 DC Converter Station owners are also required to provide information about the reactive compensation and harmonic filtering equipment required to ensure that their Plant and Apparatus complies with the criteria set out in CC.6.1.5.

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

PC.A.2.5.1 General

(a) To allow NGET 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, Power Park Units and DC Converters Synchronised to that User's System. 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 being considered.

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

(d) NGET 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 and 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 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 equipment owned, operated or managed by NGET are close to the equipment rating, and in NGET’s reasonable opinion more accurate calculations of the prospective short circuit currents are required, then NGET 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 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, DC Converter Station 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 within such Network Operator’s Systems.

PC.A.2.5.5.1 For each Generating Unit 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 within such Network Operator’s System is required to provide values for the contribution of the Power Station Auxiliaries (including Auxiliary Gas Turbines or Auxiliary Diesel Engines) 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 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 terminals, assuming a fault at that location.

PC.A.2.5.5.3 If the Power Station or DC Converter Station 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 are Synchronised to the System or when all the DC Converters at a DC Converter Station are transferring Rated MW in either direction. Where there is an alternative running arrangement (or transfer in the case of a DC Converter Station) 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 through the Station Transformers must be represented as a combined short circuit current contribution through the Station Transformers.

PC.A.2.5.5.7 For each Power Park Module and each type of Power Park Unit (eg. Doubly Fed Induction Generator), 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**, or **User System Entry Point** if Embedded

for the following solid faults at the **Grid Entry 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** 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** 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 P.C.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
NGET 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
Station Transformer high voltage terminals or
Generating Unit terminals or DC Converter 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 Station
Transformer high voltage terminals, or Generating Unit
terminals or DC Converter terminals if 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 being generated pre-fault by the
Power Park Module 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 and of
each Power Park Unit type;
The positive sequence X/R ratio of the equivalent at the Common Collection Busbar;

The minimum zero sequence impedance of the equivalent seen from the Common Collection Busbar;

The number of Power Park Units represented in the equivalent Power Park Unit;

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

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, 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 NGET accordingly at the time of data submission, NGET 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 NGET 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

GENERATING UNIT AND DC CONVERTER DATA

PC.A.3.1

Introduction

Directly Connected

PC.A.3.1.1

Each Generator and DC Converter Station owner with an existing, or proposed, Power Station or DC Converter Station directly connected, or to be directly connected, to the National Electricity Transmission System, shall provide NGET with data relating to that Power Station or DC Converter Station, 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 and DC Converter Station owner in respect of its existing, and/or proposed, Embedded Large Power Stations 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 within such Network Operator’s System in each case connected to the Subtransmission System, shall provide NGET with data relating to that Power Station or DC Converter Station, 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, 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 NGET under PC.A.3.1.4.

PC.A.3.1.3

(a) Each Network Operator shall provide NGET 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, Embedded within that Network Operator’s System. The Network Operator must inform NGET of 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 or DC Converters) together with their summated capacity.

(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 NGET'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, both current and forecast, as specified in PC.A.3.2 to PC.A.3.4. Such requirement would arise where NGET 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 Power Park Modules, and DC Converters, 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, DC Converter or Power Park Module 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 and Power Park Module 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 and Power Park Module 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 NGET 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 (j) is required with respect to each Power Park Module.

(f) **DC Converters**

Data items PC.A.3.2.2 (a), (b), (c), (d) (e) (f) (h) and (i) are required with respect to 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 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. Item (c) is to be supplied by each Network Operator in all cases:-

(a) **Registered Capacity** (MW);

(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, Embedded Power Park Module, an Offshore Transmission System at an Interface Point 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), Power Park Modules, Offshore Transmission Systems at an Interface Point 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, Embedded Power Park Module, Offshore Transmission System at an Interface Point or Embedded DC Converter is connected sufficient for NGET to determine where the MW generated by each Generating Unit, Power Park Module 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);

(e) MW obtainable from Generating Units, Power Park Modules or DC Converters at a DC Converter Station in excess of Registered Capacity;

(f) Generator Performance Chart:
   (i) at the Onshore Synchronous Generating Unit stator terminals
   (ii) at the electrical point of connection to the Offshore Transmission System for an Offshore Synchronous Generating Unit.
   (ii) 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 and DC Converter at a DC Converter Station;

Where a Reactive Despatch Network Restriction applies, its existence and details should be highlighted on the Generator Performance Chart, in sufficient detail for NGET 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** or **DC Converter Station** and type of **Generating Unit**, eg. Steam Unit, Gas Turbine Unit, Combined Cycle Gas Turbine Unit, Power Park Module, Novel Units (specify by type), etc;

(i) a list of **Power Stations** and **Generating Units** within a Cascade Hydro Scheme, identifying each **Generating Unit** 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** 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**.

- **Registered Import Capacity** (MW);
- **Import Usable** (MW) on a monthly basis;
- **Minimum Import Capacity** (MW);
- MW that may be absorbed by a **DC Converter** in excess of **Registered Import Capacity** and the duration for which this is available;

(k) the number and types of the **Power Park Units** within a **Power Park Module**, identifying each **Power Park Unit**, and the **Power Park Module** of which it forms part, unambiguously. In the case of a **Power Station** directly connected to the **National Electricity Transmission System** with multiple **Power Park Modules** where **Power Park Units** can be selected to run in different **Power Park Modules**, details of the possible configurations should also be submitted. In addition for **Offshore Power Park Modules**, the number of **Offshore Power Park Strings** that are aggregated into one **Offshore Power Park Module** 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 NGET 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, details of which are required under paragraph (j) 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 NGET gives its prior consent in writing. Notice of the wish to amend a Power Park Unit within such a Power Park Module 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 can be selected to run in different Power Park Modules as an alternative operational running arrangement the Power Park Units within the Power Park Module and the Grid Entry Point at which the power is provided can only be amended as described in BC1.A.1.7.4.

PC.A.3.3. Rated Parameters Data
PC.A.3.3.1 The following information is required to facilitate an early assessment, by NGET, of the need for more detailed studies;

(a) for all Generating Units (excluding Power Park Units) and Power Park Modules:

Rated MVA
Rated MW;

(b) for each Synchronous Generating Unit:

Short circuit ratio
Direct axis transient reactance;
Inertia constant (for whole machine), MWsecs/MVA;

(c) for each Synchronous Generating Unit step-up transformer:

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

(d) for each DC Converter at a DC Converter Station or DC Converter connecting a Power Park Module

DC 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

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

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 for a Power Park Unit not driven by a wind turbine, the data to be supplied shall be agreed with NGET 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 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 Generating Unit, Non-synchronous Generating Unit, DC Converter or Power Park Module).

(b) In the case of a Synchronous Generating Unit 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.
DEMAND AND ACTIVE ENERGY DATA

Introduction

PC.A.4.1.1 Each User directly connected to the National Electricity Transmission System with Demand shall provide NGET 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 (including Pumped Storage Generators with respect to Pumping Demand) in relation to its Demand and Active Energy requirements.

(c) each DC Converter Station owner, in relation to Demand and Active Energy transferred (imported) to its DC Converter Station.

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.

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 NGET 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 NGET 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 NGET under PC.A.4.1.4.4 (a) above shall commence in 2010 and shall then continue each year thereafter. The submission by NGET under PC.A.4.1.4.4 (b) shall commence in 2009 shall 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 NGET 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, NGET 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 NGET 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 NGET by week 6 in each year and where required by either party, both NGET 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 NGET 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 NGET pursuant to PC.A.4.2.2;

(c) day of minimum National Electricity Transmission System Demand (Active Power) as notified by NGET 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 NGET 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 seven 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 NGET made under PC.A.4.2.1 (c) and PC.A.4.2.1 (d) above shall commence in 2010 and shall the 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:

<table>
<thead>
<tr>
<th>Category</th>
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<tbody>
<tr>
<td>LV1</td>
</tr>
<tr>
<td>LV2</td>
</tr>
<tr>
<td>LV3</td>
</tr>
<tr>
<td>HV</td>
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<tr>
<td>EHV</td>
</tr>
<tr>
<td>Traction</td>
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<tr>
<td>Lighting</td>
</tr>
</tbody>
</table>

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 and Embedded DC Converter Stations with a Registered 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 NGET under PC.A.4.2.2;

(c) the time of minimum National Electricity Transmission System Demand as provided by NGET 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 NGET 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 and Embedded DC Converter Stations 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 NGET 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, NGET 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  **NGET** 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 Seven Year Statement and for use in NGET’s Operational Planning. If any User believes that the cohesive forecast Demand information in the Seven Year Statement does not reflect its assumptions on Demand, it should contact NGET to explain its concerns and may require NGET, on reasonable request, to discuss these forecasts. In the absence of such expressions, NGET will assume that Users concur with NGET’s cohesive forecast.

PC.A.4.5  **Post Fault User System Layout:**

PC.A.4.5.1 Where for the purposes of NGET 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 NGET, 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 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**
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 NGET:

(a)  details of any individual loads which have characteristics significantly different from the typical range of Domestic, Commercial 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, Stage 1 at a Point of Common Coupling including the Flicker Severity (Short Term) and the Flicker Severity (Long Term).
PART 2
DETAILED PLANNING DATA

PC.A.5
GENERATING UNIT, POWER PARK MODULE AND DC CONVERTER DATA

PC.A.5.1
Introduction

Directly Connected

PC.A.5.1.1 Each Generator, with existing or proposed Power Stations directly connected, or to be directly connected, to the National Electricity Transmission System, shall provide NGET 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, with existing or proposed DC Converter Stations directly connected, or to be directly connected, to the National Electricity Transmission System, shall provide NGET with data relating to that Plant and Apparatus, both current and forecast, as specified in PC.A.5.2 and PC.A.5.4.

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 NGET 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 Network Operator in the case of an Embedded DC Converter Station not subject to a Bilateral Agreement within its System with existing or proposed DC Converter Stations shall provide NGET with data relating to each of those 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 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 NGET under PC.A.5.1.4.

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) 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 (PC.A.3.1.4 also refers), the Network Operator must inform NGET of the number of such Power Stations (including the number of Generating
Units) together with their summated capacity. On receipt of this data further details may be required at NGET'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 Small Power Stations and Embedded DC Converters 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 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 NGET reasonably considers that the collective effect of a number of such Embedded Small Power Stations, Embedded Medium Power Stations, Embedded DC Converter Stations, DC Converters and Customer Generating Plants may have a significant system effect on the National Electricity Transmission System.

PC.A.5.2 Demand

PC.A.5.2.1 For each Generating Unit 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 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 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 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 NGET 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 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 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 seven 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, NGET may also request further details of the Demand as specified in PC.A.4.6

PC.A.5.3

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 and Power Station data should be supplied:

(a) Synchronous Generating Unit Parameters

- Rated terminal volts (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** on 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**.

**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

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**.

**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.
Option 2

(i) Governor and associated prime mover Parameters - All Generating Units

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 (this data item need only be provided for Large Power Stations)
  - Maximum Setting ±Hz
  - Normal Setting ±Hz
  - Minimum Setting ±Hz

Where the Generating Unit governor does not have a selectable deadband facility, then the actual value of the deadband 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)

[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 Frequency deadband ±Hz
- Normal Frequency deadband ±Hz
- Minimum Frequency deadband ±Hz

- Maximum output deadband ±MW
- Normal output deadband ±MW
- Minimum output deadband ±MW
Frequency settings between which Unit Load Controller Droop applies:

- Maximum Hz
- Normal Hz
- Minimum Hz

State if sustained response is normally selected.

(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 part 1, PC.A.3.3.1, to facilitate an early assessment by NGET 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 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:

(a) Power Park Unit model

A mathematical model of each type of Power Park Unit 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 NGET. 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 **NGET** with the validation evidence if requested by **NGET**. 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.

(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
  Year for which the air density is submitted
  Number of pole pairs
  Blade swept area (m\(^2\))
  Gear box ratio
Mechanical drive train

For each Power Park Unit, details of the parameters of the drive train 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 a **Power Park Unit** consisting of a synchronous machine in combination with a back to back **DC Converter**, or for a **Power Park Unit** not driven by a wind turbine, the data to be supplied shall be agreed with **NGET** in accordance with PC.A.7.

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

For the **Power Park Unit**, 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**

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.

(h) **Harmonic and flicker parameters**

When connecting a **Power Park Module**, it is necessary for **NGET** to evaluate the production of flicker and harmonics on
NGET and User's Systems. At NGET'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 NGET 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

PC.A.5.4.3.1 For a DC Converter at a DC Converter Station or a Power Park Module connected to the Total System by a DC Converter the following information for each DC Converter and DC Network should be supplied:

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

(b) DC Converter 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;
   Details of the complete DC Network, including resistance,
inductance and capacitance of all DC cables and/or DC lines;
Details of any DC reactors (including DC reactor resistance),
DC capacitors and/or DC-side filters that form part of the DC Network;

(d) AC filter reactive compensation equipment parameters

Note: The data provided pursuant to this paragraph must not include any contribution from reactive compensation plant owned or operated by NGET.

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, as a function of MW transfer, with all filters and reactive compensation plant, belonging to the DC Converter Station working correctly.

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

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

DC Converter control system models

PC.A.5.4.3.2 The following data is required by NGET to represent DC Converters and associated DC Networks in dynamic power system simulations, in which the AC power system is typically represented by a positive sequence equivalent. DC Converters are represented by simplified equations and are not modeled to switching device level.

(i) Static $V_{DC^{-1,DC}}$ (DC voltage - DC current) characteristics, for both the rectifier and inverter modes for a current source converter. Static $V_{DC^{-1,P_{DC}}}$ (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, for both the rectifier and inverter modes. A suitable model would feature the DC Converter firing angle as the output variable.

(ii) Transfer function block diagram representation including parameters of the DC 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.

Plant Flexibility Performance

PC.A.5.4.3.3 The following information on plant flexibility and performance should be supplied:

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

(ii) Nominal and maximum (emergency) loading rate with the DC 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.

PC.A.5.4.3.4 Harmonic Assessment Information

DC Converter owners shall provide such additional further information as required by NGET in order that compliance with CC.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 NGET 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, and need only be provided for each:

(i) Genset at Large Power Stations; and
(ii) Generating Unit, Power Park Module or CCGT Module at a Medium Power Station or DC Converter Station 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, CCGT Modules, Power Park Modules and DC Converters as appropriate.

In this PC.A.5.5, for a CCGT Module with more than one Generating Unit, the phrase Minimum Generation applies to the entire CCGT Module operating with all Generating Units Synchronised to the System. Similarly for a Power Park Module with more than one Power Park Unit, the phrase Minimum Generation 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. 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: -

<table>
<thead>
<tr>
<th>MLP</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLP1</td>
<td>Designed Minimum Operating Level</td>
</tr>
<tr>
<td>MLP2</td>
<td>Minimum Generation</td>
</tr>
<tr>
<td>MLP3</td>
<td>70% of Registered Capacity</td>
</tr>
<tr>
<td>MLP4</td>
<td>80% of Registered Capacity</td>
</tr>
<tr>
<td>MLP5</td>
<td>95% of Registered Capacity</td>
</tr>
<tr>
<td>MLP6</td>
<td>Registered Capacity</td>
</tr>
</tbody>
</table>

When data is provided after the Genset is first Synchronised, the MW loading points may take any value between Designed Minimum Operating Level and Registered Capacity but the value of the Designed Minimum Operating 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.5.6

Mothballed Generating Unit, Mothballed Power Park Module 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 NGET’s reasonable request.

In the case of Embedded Medium Power Stations not subject to a Bilateral Agreement and Embedded DC Converter Stations not subject to a Bilateral Agreement, upon request from NGET 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 with their System.

PC.A.5.6.1

Mothballed Generating Unit Information

Generators and DC Converter Station owners must supply with respect to each Mothballed Generating Unit, Mothballed Power Park Module 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 and DC Converter Station owners must also notify NGET of any significant factors which may prevent the Mothballed Generating Unit, Mothballed Power Park Module 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 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 NGET 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 NGET 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 Black Start Related Information

Data identified under this section PC.A.5.7 must be submitted as required under PC.A.1.2. This information may also be requested by NGET during a Black Start and should be provided by Generators where reasonably possible. Generators in this section PC.A.5.7 means Generators only in respect of their Large Power Stations.

The following data items/text must be supplied, from each Generator to NGET, with respect to each BM Unit at a Large Power Station (excluding the Generating Units that are contracted to provide Black Start Capability, Power Park Modules or Generating Units with an Intermittent Power Source);

(a) Expected time for each BM Unit to be Synchronised following a Total Shutdown or Partial Shutdown. The assessment should include the Power Station’s ability to re-synchronise all BM Units, if
all were running immediately prior to the Total Shutdown or Partial Shutdown. Additionally this should highlight any specific issues (i.e. those that would impact on the BM Unit’s time to be Synchronised) that may arise, as time progresses without external supplies being restored.

(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. Any particular ‘hold’ points should also be identified. The data of each BM Unit should be provided for the condition of a ‘hot’ unit that was Synchronised just prior to the Total Shutdown or Partial Shutdown and also for the condition of a ‘cold’ unit. The block loading assessment should be done against a frequency variation of 49.5Hz – 50.5Hz.

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**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 NGET, shall provide NGET with data on its User System which relates to the Connection Site containing the Connection Point 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.6.6 consist of data which is only to be supplied to NGET at NGET’s reasonable request. In the event that NGET identifies a reason for requiring this data, NGET shall write to the relevant User(s), requesting the data, and explaining the reasons for the request. If the User(s) wishes, NGET shall also arrange a meeting at which the request for data can be discussed, with the objective of identifying the best way in which NGET’s requirements can be met.

**PC.A.6.2 Transient Overvoltage Assessment Data**

**PC.A.6.2.1** It is occasionally necessary for NGET to undertake transient overvoltage assessments (e.g. capacitor switching transients, switchgear transient recovery voltages, etc). At NGET’s reasonable request, each User is required to provide the following data with respect to the Connection Site, 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 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: 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. 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 NGET 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 (other than Power Park Units) or Power Park Modules or DC Converters at a DC Converter Station having (or intended to have) a circuit breaker at the generator terminal voltage, clearance times for electrical faults within the Generating Unit (other than a Power Park Unit) or Power Park Module zone;

(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.

PC.A.6.4 Harmonic Studies

PC.A.6.4.1 It is occasionally necessary for NGET to evaluate the production/magnification of harmonic distortion on NGET and User's Systems, especially when NGET is connecting equipment such as capacitor banks. At NGET’s reasonable request, each User is required to submit data with respect to the Connection Site, 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 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 NGET to undertake detailed voltage assessment studies (e.g., to examine potential voltage instability, voltage control co-ordination or to calculate voltage step changes). At NGET’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:-
- 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:-
- 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:-
- 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 equipment owned, operated or managed by NGET are greater than 90% of the equipment rating, and in NGET’s reasonable opinion more accurate calculations of short-circuit currents are required, then at NGET’s request each User is required to submit data with respect to the Connection Site, current and forecast, and where not already supplied under PC.A.2.2.4 and PC.A.2.2.5, as follows:
For all circuits of the **User's Subtransmission System**:-

- 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:-

- 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:-

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.7**

**ADDITIONAL DATA FOR NEW TYPES OF POWER STATIONS, DC CONVERTER STATIONS 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** and **DC Converter Stations** emerge in future, **NGET** 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

NETWORK DATA

PC.A.8 To allow a User to model the National Electricity Transmission System, NGET 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, as an equivalent 400kV or 275kV source and also in Scotland and Offshore as an equivalent 132kV source, the data (as at the HV side of the Point of Connection reflecting data given to NGET 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 or (where NGET agrees) at suitable nodes (the nodes to be agreed with the User) within the National Electricity Transmission System. The data at the 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 NGET 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, \( I_1^n \);

(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, 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, 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 \( \pi \) 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;

(viii) the positive sequence resistance and reactance values of the two (or more) sources and the linking impedance(s) derived from a fault study, considering the short circuit current contributions after the subtransient fault current contribution has substantially decayed, constituting the \( \pi \) 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;

(ix) the corresponding zero sequence impedance values of the \( \pi \) 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 \( \pi \) loadflow equivalent; and,

(xi) where the agreed boundary nodes are not at a 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.

(b) To enable the model to be constructed, NGET 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) Since the equivalent will be produced for the 400kV or 275kV and also in Scotland and Offshore 132kV parts of the National Electricity Transmission System NGET will provide the appropriate supergrid transformer data.

(e) The positive sequence X/R ratio and the zero sequence impedance value will correspond to the NGET 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 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 NGET will, insofar as such request is reasonable, provide the information as soon as reasonably practicable following the request.
PLANNING CODE APPENDIX B

Single Line Diagram

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 a Network Operator connection, the second for a Generator connection, the third for a Power Park Module electrically equivalent system.
**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 i.e. 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**.

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.
PLANNING CODE APPENDIX C

C1.1 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.

C1.2 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.

C1.3 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

<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>DOCUMENT</th>
<th>REFERENCE No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>National Electricity Transmission System Security and Quality of Supply Standard</td>
<td>Version [ ]</td>
</tr>
<tr>
<td>2</td>
<td>System Phasing</td>
<td>TPS 13/4</td>
</tr>
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<td>4</td>
<td>Planning Limits for Voltage Fluctuations Caused by Industrial, Commercial and Domestic Equipment in the United Kingdom</td>
<td>ER P28</td>
</tr>
<tr>
<td>5</td>
<td>EHV or HV Supplies to Induction Furnaces</td>
<td>ER P16 (Supported by ACE Report No.48)</td>
</tr>
<tr>
<td>6</td>
<td>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</td>
<td>ER G5/4 (Supported by ACE Report No.73)</td>
</tr>
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Harmonic distortion ( waveform ).
Harmonic voltage distortion.
Harmonic current distortion.
Stage 1 limits.
Stage 2 limits.
Stage 3 Limits
Addition of Harmonics
Short Duration Harmonics
Site Measurements
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<td>Type of supply point to railway system.</td>
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<tr>
<td></td>
<td>Estimation of traction loads.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nature of traction current.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>System disturbance estimation.</td>
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</tr>
<tr>
<td></td>
<td>Earthing arrangements.</td>
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</tr>
<tr>
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<td></td>
<td>Main System operating procedure.</td>
<td>SOM 1</td>
</tr>
<tr>
<td></td>
<td>Operational standards of security.</td>
<td>SOM 3</td>
</tr>
<tr>
<td></td>
<td>Voltage and reactive control on main system.</td>
<td>SOM 4</td>
</tr>
<tr>
<td></td>
<td>System warnings and procedures for instructed load reduction.</td>
<td>SOM 7</td>
</tr>
<tr>
<td></td>
<td>Continuous tape recording of system control telephone messages and instructions.</td>
<td>SOM 10</td>
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<td>Emergency action in the event of an exceptionally serious breakdown of the main system.</td>
<td>SOM 15</td>
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<td>Planning Limits for Voltage Unbalance in the United Kingdom.</td>
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<td>Version [ ]</td>
</tr>
<tr>
<td>2</td>
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</tr>
<tr>
<td>7</td>
<td>AC Traction Supplies to British Rail</td>
<td>ER P24</td>
</tr>
</tbody>
</table>

### 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
- Harmonic distortion (waveform).
- Harmonic voltage distortion.
- Harmonic current distortion.
- Stage 1 limits.
- Stage 2 limits.
- Stage 3 Limits
- Addition of Harmonics
- Short Duration Harmonics
- Site Measurements

### EHV or HV Supplies to Induction Furnaces
- Voltage Unbalance limits.
- Harmonic current limits.

### AC Traction Supplies to British Rail
- Type of supply point to railway system.
- Estimation of traction loads.
- Nature of traction current.
- System disturbance estimation.
- Earthing arrangements.
APPENDIX D

Pursuant to PC.3.4, NGET will not disclose to a Relevant Transmission Licensee data items specified in the below extract:

<table>
<thead>
<tr>
<th>PC REFERENCE</th>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA CAT.</th>
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<tr>
<td>PC.A.3.2.2 (f) (i)</td>
<td>Performance Chart at Generating Unit stator terminals</td>
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<td>SPD</td>
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<tr>
<td>PC.A.3.2.2 (b)</td>
<td>Output Usable (on a monthly basis)</td>
<td>MW</td>
<td>SPD</td>
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<tr>
<td>PC.A.5.3.2 (d) Option 1 (iii)</td>
<td>GOVERNOR AND ASSOCIATED PRIME MOVER PARAMETERS</td>
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<tr>
<td>Option 1</td>
<td>BOILER &amp; STEAM TURBINE DATA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boiler time constant (Stored Active Energy)</td>
<td>S</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>HP turbine response ratio: (Proportion of Primary Response arising from HP turbine)</td>
<td>%</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>HP turbine response ratio: (Proportion of High Frequency Response arising from HP turbine)</td>
<td>%</td>
<td>DPD</td>
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<td>Option 2</td>
<td>All Generating Units</td>
<td></td>
</tr>
<tr>
<td>Governor Deadband</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Maximum Setting</td>
<td>±Hz</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>- Normal Setting</td>
<td>±Hz</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>- Minimum Setting</td>
<td>±Hz</td>
<td>DPD</td>
<td></td>
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<tr>
<td>Part of PC.A.5.3.2 (d) Option 2 (ii)</td>
<td>Steam Units</td>
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<tr>
<td>Reheater Time Constant</td>
<td>sec</td>
<td>DPD</td>
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<tr>
<td>Boiler Time Constant</td>
<td>sec</td>
<td>DPD</td>
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</tr>
<tr>
<td>HP Power Fraction</td>
<td>%</td>
<td>DPD</td>
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<tr>
<td>IP Power Fraction</td>
<td>%</td>
<td>DPD</td>
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<td>Part of PC.A.5.3.2 (d) Option 2 (iii)</td>
<td>Gas Turbine Units</td>
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<td>--------------------------------------------------------</td>
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<td></td>
<td>Waste Heat Recovery Boiler Time Constant</td>
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<th>Part of PC.A.5.3.2 (e)</th>
<th>UNIT CONTROL OPTIONS*</th>
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<tr>
<td>Maximum droop</td>
<td>%</td>
</tr>
<tr>
<td>Minimum droop</td>
<td>%</td>
</tr>
<tr>
<td>Maximum frequency deadband</td>
<td>±Hz</td>
</tr>
<tr>
<td>Normal frequency deadband</td>
<td>±Hz</td>
</tr>
<tr>
<td>Minimum frequency deadband</td>
<td>±Hz</td>
</tr>
<tr>
<td>Maximum Output deadband</td>
<td>±MW</td>
</tr>
<tr>
<td>Normal Output deadband</td>
<td>±MW</td>
</tr>
<tr>
<td>Minimum Output deadband</td>
<td>±MW</td>
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</tbody>
</table>

Frequency settings between which Unit Load Controller droop applies:

<table>
<thead>
<tr>
<th>Maximum</th>
<th>Normal</th>
<th>Minimum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hz</td>
<td>Hz</td>
<td>Hz</td>
</tr>
</tbody>
</table>

Sustained response normally selected

Yes/No | DPD |

---

<table>
<thead>
<tr>
<th>PC.A.3.2.2 (f) (ii)</th>
<th>Performance Chart of a Power Park Modules at the connection point</th>
<th>SPD</th>
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<tr>
<td>PC.A.3.2.2 (b)</td>
<td>Output Usable (on a monthly basis)</td>
<td>MW</td>
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<table>
<thead>
<tr>
<th>PC.A.3.2.2 (e) and (j)</th>
<th>DC CONVERTER STATION DATA</th>
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<tbody>
<tr>
<td>ACTIVE POWER TRANSFER CAPABILITY (PC.A.3.2.2)</td>
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</table>

Import MW available in excess of Registered Import Capacity.
Time duration for which MW in excess of Registered Import Capacity is available

<table>
<thead>
<tr>
<th>Import MW</th>
<th>SPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td>SPD</td>
</tr>
</tbody>
</table>

Export MW available in excess of Registered Capacity.
Time duration for which MW in excess of Registered Capacity is available

<table>
<thead>
<tr>
<th>Export MW</th>
<th>SPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td>SPD</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Min</th>
<th>SPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min</td>
<td>SPD</td>
</tr>
<tr>
<td>PART OF PC.A.5.4.3.3</td>
<td>LOADING PARAMETERS</td>
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<tr>
<td>----------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td></td>
<td>Nominal loading</td>
</tr>
<tr>
<td></td>
<td>rate</td>
</tr>
<tr>
<td></td>
<td>Maximum (emergency)</td>
</tr>
<tr>
<td></td>
<td>loading rate</td>
</tr>
</tbody>
</table>

**LOADING PARAMETERS**

- MW Export
  - Nominal loading rate
  - Maximum (emergency) loading rate

- MW Import
  - Nominal loading rate
  - Maximum (emergency) loading rate
PLANNING CODE APPENDIX E

OFFSHORE TRANSMISSION SYSTEM TECHNICAL AND DESIGN CRITERIA

E1.1 In the absence of any relevant Electrical Standards, Offshore Transmission Licensees 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 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.

E1.2 The table below identifies the technical and design criteria that will be used in the design and development of an Offshore Transmission System.

<table>
<thead>
<tr>
<th>ITEM No.</th>
<th>DOCUMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>National Electricity Transmission System Security and Quality of Supply Standard Version []</td>
</tr>
<tr>
<td>2*</td>
<td>Planning Limits for Voltage Fluctuations Caused by Industrial, Commercial and Domestic Equipment in the United Kingdom ER P28</td>
</tr>
<tr>
<td>3*</td>
<td>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</td>
</tr>
<tr>
<td>4*</td>
<td>Planning Limits for Voltage Unbalance in the United Kingdom ER P29</td>
</tr>
</tbody>
</table>

* Note:- Items 2, 3 and 4 above shall only apply at the Interface Point.

< End of Planning Code (PC) >
## CONNECTION CONDITIONS

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(This contents page does not form part of the Grid Code)

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CONNECTION CONDITIONS

CC.1 INTRODUCTION

CC.1.1 The Connection Conditions ("CC") specify both the minimum technical, design and operational criteria which must be complied with by any User connected to or seeking connection with the National Electricity Transmission System or Generators (other than in respect of Small Power Stations) or DC Converter Station owners connected to or seeking connection to a User's System which is located in Great Britain or Offshore, and the minimum technical, design and operational criteria with which NGTE will comply in relation to the part of the National Electricity Transmission System at the Connection Site with Users.

CC.2 OBJECTIVE

CC.2.1 The objective of the CC is to ensure that by specifying minimum technical, design and operational criteria the basic rules for connection to the National Electricity Transmission System and (for certain Users) to a User's System are similar for all Users of an equivalent category and will enable NGTE to comply with its statutory and Transmission Licence obligations.

CC.3 SCOPE

CC.3.1 The CC applies to NGTE and to Users, which in the CC means:

(a) Generators (other than those which only have Embedded Small Power Stations)

(b) Network Operators;

(c) Non-Embedded Customers;

(d) DC Converter Station owners; and

(e) BM Participants and Externally Interconnected System Operators in respect of CC.6.5 only.

CC.3.2 The above categories of User will become bound by the CC prior to them generating, distributing, supplying or consuming, as the case may be, and references to the various categories should, therefore, be taken as referring to them in that prospective role as well as to Users actually connected.

CC.3.3 The obligations within the CC that are expressed to be applicable to Generators in respect of Embedded Medium Power Stations not subject to a Bilateral Agreement and DC Converter Station Owners in respect of Embedded DC Converter Stations not subject to a Bilateral Agreement (where the obligations are in each case listed in CC.3.4) shall be read and construed as obligations that the Network Operator within whose System any such Medium Power Station or DC Converter Station is Embedded must ensure are performed and discharged by the Generator or the DC Converter Station owner. Embedded Medium Power Stations not subject to a Bilateral Agreement and Embedded DC Converter Stations not subject to a Bilateral Agreement which are located Offshore and which are connected to an Onshore User System will be required to meet the applicable requirements of the Grid Code as though they are an Onshore
Generator or Onshore DC Converter Station Owner connected to an Onshore User System Entry Point.

CC.3.4 The Network Operator within whose System a Medium Power Station not subject to a Bilateral Agreement is Embedded or a DC Converter Station not subject to a Bilateral Agreement is Embedded must ensure that the following obligations in the CC are performed and discharged by the Generator in respect of each such Embedded Medium Power Station or the DC Converter Station owner in the case of an Embedded DC Converter Station:

CC.5.1
CC.5.2.2
CC.5.3
CC.6.1.3
CC.6.1.5 (b)
CC.6.3.2, CC.6.3.3, CC.6.3.4, CC.6.3.6, CC.6.3.7, CC.6.3.8, CC.6.3.9, CC.6.3.10, CC.6.3.12, CC.6.3.13, CC.6.3.15, CC.6.3.16
CC.6.4.4
CC.6.5.6 (where required by CC.6.4.4)

In respect of CC.6.2.2.2, CC.6.2.2.3, CC.6.2.2.5, CC.6.1.5(a), CC.6.1.5(b) and CC.6.3.11 equivalent provisions as co-ordinated and agreed with the Network Operator and Generator or DC Converter Station owner may be required. Details of any such requirements will be notified to the Network Operator in accordance with CC.3.5.

CC.3.5 In the case of Embedded Medium Power Stations not subject to a Bilateral Agreement and Embedded DC Converter Stations not subject to a Bilateral Agreement the requirements in:

CC.6.1.6
CC.6.3.8
CC.6.3.12
CC.6.3.15
CC.6.3.16

that would otherwise have been specified in a Bilateral Agreement will be notified to the relevant Network Operator in writing in accordance with the provisions of the CUSC and the Network Operator must ensure such requirements are performed and discharged by the Generator or the DC Converter Station owner.

CC.3.6 In the case of Offshore Embedded Power Stations connected to an Offshore User’s System which directly connects to an Offshore Transmission System, any additional 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 NGET and such Offshore Embedded Power Station.

CC.4

CC.4.1 PROCEDURE

The CUSC contains provisions relating to the procedure for connection to the National Electricity Transmission System or, in the case of Embedded Power Stations or Embedded DC Converter Stations, becoming operational and includes provisions relating to certain conditions to be complied with by Users prior to NGET notifying the User that it has the right to become operational.
CC.5. CONNECTION

CC.5.1 The provisions relating to connecting to the National Electricity Transmission System (or to a User’s System in the case of a connection of an Embedded Large Power Station or Embedded Medium Power Station or Embedded DC Converter Station) are contained in

(a) the CUSC and/or CUSC Contract (or in the relevant application form or offer for a CUSC Contract)
(b) or, in the case of an Embedded Development, the relevant Distribution Code and/or the Embedded Development Agreement for the connection (or in the relevant application form or offer for an Embedded Development Agreement),

and include provisions relating to both the submission of information and reports relating to compliance with the relevant Connection Conditions for that User, Safety Rules, commissioning programmes, Operation Diagrams and approval to connect (and their equivalents in the case of Embedded Medium Power Stations not subject to a Bilateral Agreement or Embedded DC Converter Stations not subject to a Bilateral Agreement). References in the CC to the “Bilateral Agreement” and/or “Construction Agreement” and/or “Embedded Development Agreement” shall be deemed to include references to the application form or offer therefor.

CC.5.2 Items for submission

CC5.2.1 Prior to the Completion Date under the Bilateral Agreement and/or Construction Agreement, the following is submitted pursuant to the terms of the Bilateral Agreement and/or Construction Agreement:

(a) updated Planning Code data (both Standard Planning Data and Detailed Planning Data), with any estimated values assumed for planning purposes 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, pursuant to the requirements of the Planning Code;

(b) details of the Protection arrangements and settings referred to in CC.6;

(c) copies of all Safety Rules and Local Safety Instructions applicable at Users' Sites which will be used at the NGET/User interface (which, for the purpose of OC8, must be to NGET’s satisfaction regarding the procedures for Isolation and Earthing. For User Sites in Scotland and Offshore NGET will consult the Relevant Transmission Licensee when determining whether the procedures for Isolation and Earthing are satisfactory);

(d) information to enable NGET to prepare Site Responsibility Schedules on the basis of the provisions set out in Appendix 1;

(e) an Operation Diagram for all HV Apparatus on the User side of the Connection Point as described in CC.7;

(f) the proposed name of the User Site (which shall not be the same as, or confusingly similar to, the name of any Transmission Site or of any other User Site);
(g) written confirmation that Safety Coordinators acting on behalf of the User are authorised and competent pursuant to the requirements of OC8;

(h) RISSP prefixes pursuant to the requirements of OC8. NGET is required to circulate prefixes utilising a proforma in accordance with OC8;

(i) a list of the telephone numbers for Joint System Incidents at which senior management representatives nominated for the purpose can be contacted and confirmation that they are fully authorised to make binding decisions on behalf of the User, pursuant to OC9;

(j) a list of managers who have been duly authorised to sign Site Responsibility Schedules on behalf of the User;

(k) information to enable NGET to prepare Site Common Drawings as described in CC.7;

(l) a list of the telephone numbers for the Users facsimile machines referred to in CC.6.5.9; and

(m) for Sites in Scotland and Offshore a list of persons appointed by the User to undertake operational duties on the User’s System and to issue and receive operational messages and instructions in relation to the User’s System; and an appointed person or persons responsible for the maintenance and testing of User’s Plant and Apparatus.

CC.5.2.2 Prior to the Completion Date the following must be submitted to NGET by the Network Operator in respect of an Embedded Development:

(a) updated Planning Code data (both Standard Planning Data and Detailed Planning Data), with any estimated values assumed for planning purposes 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, pursuant to the requirements of the Planning Code;

(b) details of the Protection arrangements and settings referred to in CC.6;

(c) the proposed name of the Embedded Medium Power Station or Embedded DC Converter Station Site (which shall be agreed with NGET unless it is the same as, or confusingly similar to, the name of other Transmission Site or User Site);

CC.5.2.3 Prior to the Completion Date contained within an Offshore Transmission Distribution Connection Agreement the following must be submitted to NGET by the Network Operator in respect of a proposed new Interface Point within its User System:

(a) updated Planning Code data (both Standard Planning Data and Detailed Planning Data), with any estimated values assumed for planning purposes 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, pursuant to the requirements of the Planning Code;

(b) details of the Protection arrangements and settings referred to in CC.6;
(c) the proposed name of the **Interface Point** (which shall not be the same as, or confusingly similar to, the name of any **Transmission Site** or of any other **User Site**);

CC.5.3

(a) Of the items CC.5.2.1 (c), (e), (g), (h), (k) and (m) need not be supplied in respect of **Embedded Power Stations** or **Embedded DC Converter Stations**,

(b) item CC.5.2.1(i) need not be supplied in respect of **Embedded Small Power Stations** and **Embedded Medium Power Stations** or **Embedded DC Converter Stations** with a **Registered Capacity** of less than 100MW, and

(c) items CC.5.2.1(d) and (j) are only needed in the case where the **Embedded Power Station** or the **Embedded DC Converter Station** is within a **Connection Site** with another **User**.

CC.5.4

In addition, at the time the information is given under CC.5.2(g), **NGET** will provide written confirmation to the **User** that the **Safety Co-ordinators** acting on behalf of **NGET** are authorised and competent pursuant to the requirements of **OC8**.
CC.6 TECHNICAL, DESIGN AND OPERATIONAL CRITERIA

CC.6.1 NATIONAL ELECTRICITY TRANSMISSION SYSTEM PERFORMANCE CHARACTERISTICS

CC.6.1.1 NGET shall ensure that, subject as provided in the Grid Code, the National Electricity Transmission System complies with the following technical, design and operational criteria in relation to the part of the National Electricity Transmission System at the Connection Site with a User (unless otherwise specified in CC.6) although in relation to operational criteria NGET may be unable (and will not be required) to comply with this obligation to the extent that there are insufficient Power Stations or User Systems are not available or Users do not comply with NGET's instructions or otherwise do not comply with the Grid Code and each User shall ensure that its Plant and Apparatus complies with the criteria set out in CC.6.1.5.

Grid Frequency Variations

CC.6.1.2 The Frequency of the National Electricity Transmission System shall be nominally 50Hz and shall be controlled within the limits of 49.5 - 50.5Hz unless exceptional circumstances prevail.

CC.6.1.3 The System Frequency could rise to 52Hz or fall to 47Hz in exceptional circumstances. Design of User's Plant and Apparatus must enable operation of that Plant and Apparatus within that range in accordance with the following:-

<table>
<thead>
<tr>
<th>Frequency Range</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>47.5Hz - 52Hz</td>
<td>Continuous operation is required</td>
</tr>
<tr>
<td>47Hz - 47.5Hz</td>
<td>Operation for a period of at least 20 seconds is required each time the Frequency is below 47.5Hz.</td>
</tr>
</tbody>
</table>

Grid Voltage Variations

CC.6.1.4 Subject as provided below, the voltage on the 400kV part of the National Electricity Transmission System at each Connection Site with a User will normally remain within ±5% of the nominal value unless abnormal conditions prevail. The minimum voltage is -10% and the maximum voltage is +10% unless abnormal conditions prevail, but voltages between +5% and +10% will not last longer than 15 minutes unless abnormal conditions prevail. Voltages on the 275kV and 132kV parts of the National Electricity Transmission System at each Connection Site with a User will normally remain within the limits ±10% of the nominal value unless abnormal conditions prevail. At nominal System voltages below 132kV the voltage of the National Electricity Transmission System at each Connection Site with a User will normally remain within the limits ±6% of the nominal value unless abnormal conditions prevail. Under fault conditions, voltage may collapse transiently to zero at the point of fault until the fault is cleared.

NGET and a User may agree greater or lesser variations in voltage to those set out above in relation to a particular Connection Site, and insofar as a greater or lesser variation is agreed, the relevant figure set out above shall, in relation to that User at the particular Connection Site, be replaced by the figure agreed.
Voltage Waveform Quality

CC.6.1.5 All Plant and Apparatus connected to the National Electricity Transmission System, and that part of the National Electricity Transmission System at each Connection Site, should be capable of withstanding the following distortions of the voltage waveform in respect of harmonic content and phase unbalance:

(a) Harmonic Content

The Electromagnetic Compatibility Levels for harmonic distortion on the Onshore Transmission System from all sources under both Planned Outage and fault outage conditions, (unless abnormal conditions prevail) shall comply with the levels shown in the tables of Appendix A of Engineering Recommendation G5/4. The Electromagnetic Compatibility Levels for harmonic distortion on an Offshore Transmission System will be defined in relevant Bilateral Agreements.

Engineering Recommendation G5/4 contains planning criteria which NGET will apply to the connection of non-linear Load to the National Electricity Transmission System, which may result in harmonic emission limits being specified for these Loads in the relevant Bilateral Agreement. The application of the planning criteria will take into account the position of existing and prospective Users’ Plant and Apparatus in relation to harmonic emissions. Users must ensure that connection of distorting loads to their User Systems do not cause any harmonic emission limits specified in the Bilateral Agreement, or where no such limits are specified, the relevant planning levels specified in Engineering Recommendation G5/4 to be exceeded.

(b) Phase Unbalance

Under Planned Outage conditions, the maximum Phase (Voltage) Unbalance on the National Electricity Transmission System should remain, in England and Wales, below 1%, and in Scotland, below 2%, unless abnormal conditions prevail and Offshore will be defined in relevant Bilateral Agreements.

CC.6.1.6 In England and Wales, under the Planned Outage conditions stated in CC.6.1.5(b) infrequent short duration peaks with a maximum value of 2% are permitted for Phase (Voltage) Unbalance, subject to the prior agreement of NGET under the Bilateral Agreement. NGET will only agree following a specific assessment of the impact of these levels on Transmission Apparatus and other Users Apparatus with which it is satisfied.

Voltage Fluctuations

CC.6.1.7 Voltage fluctuations at a Point of Common Coupling with a fluctuating Load directly connected to the Onshore Transmission System shall not exceed:

(a) In England and Wales, 1% of the voltage level for step changes which may occur repetitively. Any large voltage excursions other than step changes may be allowed up to a level of 3% provided that this does not constitute a risk to the National Electricity Transmission System or, in NGET's view, to the System of any User. In Scotland, the limits for voltage level step changes are as set out in Engineering Recommendation P28.
(b) For voltages above 132kV, Flicker Severity (Short Term) of 0.8 Unit and a Flicker Severity (Long Term) of 0.6 Unit, for voltages 132kV and below, Flicker Severity (Short Term) of 1.0 Unit and a Flicker Severity (Long Term) of 0.8 Unit, as set out in Engineering Recommendation P28 as current at the Transfer Date.

CC.6.8 Voltage fluctuations at a Point of Common Coupling with a fluctuating Load directly connected to an Offshore Transmission System shall not exceed the limits set out in the Bilateral Agreement.

CC.6.2 PLANT AND APPARATUS RELATING TO CONNECTION SITE

The following requirements apply to Plant and Apparatus relating to the Connection Point, which (except as otherwise provided in the relevant paragraph) each User must ensure are complied with in relation to its Plant and Apparatus and which in the case of CC.6.2.2.2.2, CC.6.2.3.1.1 and CC.6.2.1.1(b) only, NGET must ensure are complied with in relation to Transmission Plant and Apparatus, as provided in those paragraphs.

CC.6.2.1 General Requirements

CC.6.2.1.1 (a) The design of connections between the National Electricity Transmission System and:-

(i) any Generating Unit (other than a CCGT Unit or Power Park Unit) DC Converter, Power Park Module or CCGT Module, or

(ii) any Network Operator’s User System, or

(iii) Non-Embedded Customers equipment;

will be consistent with the Licence Standards.

(b) The National Electricity Transmission System at nominal System voltages of 132kV and above is designed to be earthed with an Earth Fault Factor of, in England and Wales or Offshore, below 1.4 and in Scotland, below 1.5. Under fault conditions the rated Frequency component of voltage could fall transiently to zero on one or more phases or, in England and Wales, rise to 140% phase-to-earth voltage, or in Scotland, rise to 150% phase-to-earth voltage. The voltage rise would last only for the time that the fault conditions exist. The fault conditions referred to here are those existing when the type of fault is single or two phase-to-earth.

(c) For connections to the National Electricity Transmission System at nominal System voltages of below 132kV the earthing requirements and voltage rise conditions will be advised by NGET as soon as practicable prior to connection.

CC.6.2.1.2 Substation Plant and Apparatus

(a) The following provisions shall apply to all Plant and Apparatus which is connected at the voltage of the Connection Point and which is contained in equipment bays that are within the Transmission busbar protection zone at the Connection Point. This includes circuit breakers, switch disconnectors, disconnectors, Earthing Devices, power transformers, voltage transformers, reactors, current transformers, surge arresters, bushings, neutral equipment, capacitors, line traps, coupling devices, external
insulation and insulation co-ordination devices. Where necessary, this is as more precisely defined in the Bilateral Agreement.

(i) Plant and/or Apparatus prior to 1st January 1999

Each item of such Plant and/or Apparatus which at 1st January 1999 is either:

- installed; or
- owned (but is either in storage, maintenance or awaiting installation); or
- ordered

and is the subject of a Bilateral Agreement with regard to the purpose for which it is in use or intended to be in use, shall comply with the relevant standards/specifications applicable at the time that the Plant and/or Apparatus was designed (rather than commissioned) and any further requirements as specified in the Bilateral Agreement.

(ii) Plant and/or Apparatus post 1st January 1999 for a new Connection Point

Each item of such Plant and/or Apparatus installed in relation to a new Connection Point after 1st January 1999 shall comply with the relevant Technical Specifications and any further requirements identified by NGET, acting reasonably, to reflect the options to be followed within the Technical Specifications and/or to complement if necessary the Technical Specifications so as to enable NGET to comply with its obligations in relation to the National Electricity Transmission System or, in Scotland or Offshore, the Relevant Transmission Licensee to comply with its obligations in relation to its Transmission System. This information, including the application dates of the relevant Technical Specifications, will be as specified in the Bilateral Agreement.

(iii) New Plant and/or Apparatus post 1st January 1999 for an existing Connection Point

Each new additional and/or replacement item of such Plant and/or Apparatus installed in relation to a change to an existing Connection Point after 1st January 1999 shall comply with the standards/specifications applicable when the change was designed, or such other standards/specifications as necessary to ensure that the item of Plant and/or Apparatus is reasonably fit for its intended purpose having due regard to the obligations of NGET, the relevant User and, in Scotland, or Offshore, also the Relevant Transmission Licensee under their respective Licences. Where appropriate this information, including the application dates of the relevant standards/specifications, will be as specified in the varied Bilateral Agreement.

(iv) Used Plant and/or Apparatus being moved, re-used or modified

If, after its installation, any such item of Plant and/or Apparatus is subsequently:

- moved to a new location; or
- used for a different purpose; or
- otherwise modified;
then the standards/specifications as described in (i), (ii), or (iii) above as applicable will apply as appropriate to such Plant and/or Apparatus, which must be reasonably fit for its intended purpose having due regard to the obligations of NGET, the relevant User and, in Scotland or Offshore, also the Relevant Transmission Licensee under their respective Licences.

(b) NGET shall at all times maintain a list of those Technical Specifications and additional requirements which might be applicable under this CC.6.2.1.2 and which may be referenced by NGET in the Bilateral Agreement. NGET shall provide a copy of the list upon request to any User. NGET shall also provide a copy of the list to any new User upon receipt of an application form for a Bilateral Agreement for a new Connection Point.

(c) Where the User provides NGET with information and/or test reports in respect of Plant and/or Apparatus which the User reasonably believes demonstrate the compliance of such items with the provisions of a Technical Specification then NGET shall promptly and without unreasonable delay give due and proper consideration to such information.

(d) Plant and Apparatus shall be designed, manufactured and tested in premises with an accredited certificate in accordance with the quality assurance requirements of the relevant standard in the BS EN ISO 9000 series (or equivalent as reasonably approved by NGET) or in respect of test premises which do not include a manufacturing facility premises with an accredited certificate in accordance with BS EN 45001.

(e) Each connection between a User and the National Electricity Transmission System must be controlled by a circuit-breaker (or circuit breakers) capable of interrupting the maximum short circuit current at the point of connection. The Seven Year Statement gives values of short circuit current and the rating of Transmission circuit breakers at existing and committed Connection Points for future years.

CC.6.2.2 Requirements at Connection Points that relate to Generators or DC Converter Station owners

CC.6.2.2.1 Not Used.

CC.6.2.2.2 Generating Unit and Power Station Protection Arrangements

CC.6.2.2.2.1 Minimum Requirements

Protection of Generating Units (other than Power Park Units), DC Converters or Power Park Modules and their connections to the National Electricity Transmission System must meet the minimum requirements given below. These are necessary to reduce to a practical minimum the impact on the National Electricity Transmission System of faults on circuits owned by Generators or DC Converter Station owners.

CC.6.2.2.2 Fault Clearance Times

(a) The fault clearance times for faults on the Generator's or DC Converter Station owner's equipment directly connected to the National Electricity Transmission System and for faults on the National Electricity Transmission System directly connected to the Generator or DC Converter Station owner's equipment, from fault inception to the circuit breaker arc
extinction, shall be set out in accordance with the **Bilateral Agreement**. The times specified in accordance with the **Bilateral Agreement** shall not be faster than:

(i) 80mS at 400kV  
(ii) 100mS at 275kV  
(iii) 120mS at 132kV and below

but this shall not prevent a **User** or **NGET** having faster fault clearance times.

Slower fault clearance times may be specified in accordance with the **Bilateral Agreement** for faults on the **National Electricity Transmission System**. Slower fault clearance times for faults on the **Generator** or **DC Converter Station** owner’s equipment may be agreed in accordance with the terms of the **Bilateral Agreement** but only if **System** requirements, in **NGET**’s view, permit. The probability that the fault clearance times stated in accordance with the **Bilateral Agreement** will be exceeded by any given fault, must be less than 2%.

(b) For the event that the above fault clearance times are not met as a result of failure to operate on the **Main Protection System(s)** provided, the **Generators** or **DC Converter Station** owners shall provide **Back-Up Protection**. **NGET** will also provide **Back-Up Protection** and these **Back-Up Protections** will be co-ordinated so as to provide **Discrimination**.

On a **Generating Unit** (other than **Power Park Units**), **DC Converter** or **Power Park Module** connected to the **National Electricity Transmission System** where only one **Main Protection** is provided to clear faults on the **HV Connections** within the required fault clearance time, the **Back-Up Protection** provided by the **Generators** and **DC Converter Station** owners shall operate to give a fault clearance time of no slower than 300 ms at the minimum infeed for normal operation for faults on the **HV Connections**. On **Generating Units** (other than **Power Park Units**), **DC Converters** or **Power Park Modules** connected to the **National Electricity Transmission System** at 400 kV and 275 kV where two **Main Protections** are provided and on **Generating Units** (other than **Power Park Units**), **DC Converters** or **Power Park Modules** connected to the **National Electricity Transmission System** at 132 kV and below, the **Back-Up Protection** shall operate to give a fault clearance time of no slower than 800 ms in England and Wales or **Offshore** and 300 ms in Scotland at the minimum infeed for normal operation for faults on the **HV Connections**.

**Generators’** and **DC Converter Station** owners’ **Back-Up Protection** will also be required to withstand, without tripping, the loading incurred during the clearance of a fault on the **National Electricity Transmission System** by breaker fail **Protection** at 400kV or 275kV or of a fault cleared by **Back-Up Protection** where the **Generator** or **DC Converter** is connected at 132kV and below. This will permit **Discrimination** between **Generator** or **DC Converter** **Back-Up Protection** and **Back-Up Protection** provided on the **National Electricity Transmission System** and other **Users’ Systems**.

(c) When the **Generating Unit** (other than **Power Park Units**), or the **DC Converter** or **Power Park Module** is connected to the **National Electricity Transmission System** at 400kV or 275kV, and in **Scotland** and **Offshore** also at 132kV, and a circuit breaker is provided by the **Generator** or the **DC Converter Station** owner, or **NGET**, as the case may be, to interrupt fault current interchange with the **National Electricity Transmission System**, or
Generator's System, or DC Converter Station owner's System, as the case may be, circuit breaker fail Protection shall be provided by the Generator or DC Converter Station owner, or NGET, as the case may be, on this circuit breaker. In the event, following operation of a Protection system, of a failure to interrupt fault current by these circuit-breakers within the Fault Current Interruption Time, the circuit breaker fail Protection is required to initiate tripping of all the necessary electrically adjacent circuit-breakers so as to interrupt the fault current within the next 200 ms.

(d) The target performance for the System Fault Dependability Index shall be not less than 99%. This is a measure of the ability of Protection to initiate successful tripping of circuit breakers which are associated with the faulty item of Apparatus.

CC.6.2.2.3 Equipment to be provided

CC.6.2.2.3.1 Protection of Interconnecting Connections

The requirements for the provision of Protection equipment for interconnecting connections will be specified in the Bilateral Agreement. In this CC the term "interconnecting connections" means the primary conductors from the current transformer accommodation on the circuit side of the circuit breaker to the Connection Point.

CC.6.2.2.3.2 Circuit-breaker fail Protection

The Generator or DC Converter Station owner will install circuit breaker fail Protection equipment in accordance with the requirements of the Bilateral Agreement. The Generator or DC Converter Station owner will also provide a back-trip signal in the event of loss of air from its pressurised head circuit breakers, during the Generating Unit (other than a CCGT Unit or Power Park Unit) or CCGT Module or DC Converter or Power Park Module run-up sequence, where these circuit breakers are installed.

CC.6.2.2.3.3 Loss of Excitation

The Generator must provide Protection to detect loss of excitation on a Generating Unit and initiate a Generating Unit trip.

CC.6.2.2.3.4 Pole-Slipping Protection

Where, in NGET's reasonable opinion, System requirements dictate, NGET will specify in the Bilateral Agreement a requirement for Generators to fit pole-slipping Protection on their Generating Units.

CC.6.2.2.3.5 Signals for Tariff Metering

Generators and DC Converter Station owners will install current and voltage transformers supplying all tariff meters at a voltage to be specified in, and in accordance with, the Bilateral Agreement.

CC.6.2.2.4 Work on Protection Equipment

No busbar Protection, mesh corner Protection, circuit-breaker fail Protection relays, AC or DC wiring (other than power supplies or DC tripping associated with the Generating Unit, DC Converter or Power Park Module itself) may be worked upon or altered by the Generator or DC Converter Station owner personnel in the
absence of a representative of NGET or in Scotland or Offshore, a representative of NGET, or written authority from NGET to perform such work or alterations in the absence of a representative of NGET.

CC.6.2.5 Relay Settings

Protection and relay settings will be co-ordinated (both on connection and subsequently) across the Connection Point in accordance with the Bilateral Agreement to ensure effective disconnection of faulty Apparatus.

CC.6.2.3 Requirements at Connection Points relating to Network Operators and Non-Embedded Customers

CC.6.2.3.1 Protection Arrangements for Network Operators and Non-Embedded Customers

CC.6.2.3.1.1 Protection of Network Operator and Non-Embedded Customers User Systems directly supplied from the National Electricity Transmission System, must meet the minimum requirements referred to below:

Fault Clearance Times

(a) The fault clearance times for faults on Network Operator and Non-Embedded Customer equipment directly connected to the National Electricity Transmission System, and for faults on the National Electricity Transmission System directly connected to the Network Operator’s or Non-Embedded Customer’s equipment, from fault inception to the circuit breaker arc extinction, shall be set out in accordance with each Bilateral Agreement. The times specified in accordance with the Bilateral Agreement shall not be faster than:

(i) 80mS at 400kV  
(ii) 100mS at 275kV  
(iii) 120mS at 132kV and below

but this shall not prevent a User or NGET having a faster fault clearance time.

Slower fault clearance times may be specified in accordance with the Bilateral Agreement for faults on the National Electricity Transmission System. Slower fault clearance times for faults on the Network Operator and Non-Embedded Customers equipment may be agreed in accordance with the terms of the Bilateral Agreement but only if System requirements in NGET's view permit. The probability that the fault clearance times stated in accordance with the Bilateral Agreement will be exceeded by any given fault must be less than 2%.

(b) (i) For the event of failure of the Protection systems provided to meet the above fault clearance time requirements, Back-Up Protection shall be provided by the Network Operator or Non-Embedded Customer as the case may be.

(ii) NGET will also provide Back-Up Protection, which will result in a fault clearance time slower than that specified for the Network Operator or Non-Embedded Customer Back-Up Protection so as to provide Discrimination.
(iii) For connections with the National Electricity Transmission System at 132kV and below, it is normally required that the Back-Up Protection on the National Electricity Transmission System shall discriminate with the Network Operator or Non-Embedded Customer's Back-Up Protection.

(iv) For connections with the National Electricity Transmission System at 400kV or 275kV, the Back-Up Protection will be provided by the Network Operator or Non-Embedded Customer, as the case may be, with a fault clearance time not slower than 300mS for faults on the Network Operator's or Non-Embedded Customer's Apparatus.

(v) Such Protection will also be required to withstand, without tripping, the loading incurred during the clearance of a fault on the National Electricity Transmission System by breaker fail Protection at 400kV or 275kV. This will permit Discrimination between Network Operator or Non-Embedded Customer, as the case may be, Back-Up Protection and Back-Up Protection provided on the National Electricity Transmission System and other User Systems. The requirement for and level of Discrimination required will be specified in the Bilateral Agreement.

(c) (i) Where the Network Operator or Non-Embedded Customer is connected to the National Electricity Transmission System at 400kV or 275kV, and in Scotland also at 132kV, and a circuit breaker is provided by the Network Operator or Non-Embedded Customer, or NGET, as the case may be, to interrupt the interchange of fault current with the National Electricity Transmission System or the System of the Network Operator or Non-Embedded Customer, as the case may be, circuit breaker fail Protection will be provided by the Network Operator or Non-Embedded Customer, or NGET, as the case may be, on this circuit breaker.

(ii) In the event, following operation of a Protection system, of a failure to interrupt fault current by these circuit-breakers within the Fault Current Interruption Time, the circuit breaker fail Protection is required to initiate tripping of all the necessary electrically adjacent circuit-breakers so as to interrupt the fault current within the next 200 ms.

(d) The target performance for the System Fault Dependability Index shall be not less than 99%. This is a measure of the ability of Protection to initiate successful tripping of circuit breakers which are associated with the faulty items of Apparatus.

CC.6.2.3.2 Fault Disconnection Facilities

(a) Where no Transmission circuit breaker is provided at the User's connection voltage, the User must provide NGET with the means of tripping all the User's circuit breakers necessary to isolate faults or System abnormalities on the National Electricity Transmission System. In these circumstances, for faults on the User's System, the User's Protection should also trip higher voltage Transmission circuit breakers. These tripping facilities shall be in accordance with the requirements specified in the Bilateral Agreement.

(b) NGET may require the installation of a System to Generator Operational Intertripping Scheme in order to enable the timely restoration of circuits
following power **System** fault(s). These requirements shall be set out in the relevant **Bilateral Agreement**.

**CC.6.2.3.3 Automatic Switching Equipment**

Where automatic reclosure of **Transmission** circuit breakers is required following faults on the **User’s System**, automatic switching equipment shall be provided in accordance with the requirements specified in the **Bilateral Agreement**.

**CC.6.2.3.4 Relay Settings**

**Protection** and relay settings will be co-ordinated (both on connection and subsequently) across the **Connection Point** in accordance with the **Bilateral Agreement** to ensure effective disconnection of faulty **Apparatus**.

**CC.6.2.3.5 Work on **Protection** equipment**

Where a **Transmission Licensee** owns the busbar at the **Connection Point**, no busbar **Protection**, mesh corner **Protection** relays, AC or DC wiring (other than power supplies or DC tripping associated with the **Network Operator** or **Non-Embedded Customer’s Apparatus** itself) may be worked upon or altered by the **Network Operator** or **Non-Embedded Customer** personnel in the absence of a representative of **NGET** or in Scotland, a representative of **NGET**, or written authority from **NGET** to perform such work or alterations in the absence of a representative of **NGET**.

**CC.6.2.3.6 Equipment to be provided**

**CC.6.2.3.6.1 Protection of Interconnecting Connections**

The requirements for the provision of **Protection** equipment for interconnecting connections will be specified in the **Bilateral Agreement**.
**CC.6.3 GENERAL GENERATING UNIT REQUIREMENTS**

**CC.6.3.1** This section sets out the technical and design criteria and performance requirements for Generating Units, DC Converters and Power Park Modules (whether directly connected to the National Electricity Transmission System or Embedded) which each Generator or DC Converter Station owner must ensure are complied with in relation to its Generating Units, DC Converters and Power Park Modules but does not apply to Small Power Stations or individually to Power Park Units. References to Generating Units, DC Converters and Power Park Modules in this CC.6.3 should be read accordingly.

**Plant Performance Requirements**

**CC.6.3.2 (a)** When supplying Rated MW all Onshore Synchronous Generating Units must be capable of continuous operation at any point between the limits 0.85 Power Factor lagging and 0.95 Power Factor leading at the Onshore Synchronous Generating Unit terminals. At Active Power output levels other than Rated MW, all Onshore Synchronous Generating Units must be capable of continuous operation at any point between the Reactive Power capability limits identified on the Generator Performance Chart.

In addition to the above paragraph, where Onshore Synchronous Generating Unit(s):

(i) have a CEC which has been increased above Rated MW (or the CEC of the CCGT module has increased above the sum of the Rated MW of the Generating Units compromising the CCGT module), and such increase takes effect after 1st May 2009, the minimum lagging Reactive Power capability at the terminals of the Onshore Synchronous Generating Unit(s) must be 0.9 Power Factor at all Active Power output levels in excess of Rated MW. Further, the User shall comply with the provisions of and any instructions given pursuant to BC1.8 and the relevant Bilateral Agreement: or

(ii) Have a CEC in excess of Rated MW (or the CEC of the CCGT module exceeds the sum of Rated MW of the Generating Units comprising the CCGT module) and a Completion Date before 1st May 2009, alternative provisions relating to Reactive Power capability may be specified in the Bilateral Agreement and where this is the case such provisions must be complied with.

The short circuit ratio of Onshore Synchronous Generating Units shall be not less than 0.5.

(b) Subject to paragraph (c) below, all Onshore Non-Synchronous Generating Units, Onshore DC Converters and Onshore Power Park Modules must be capable of maintaining zero transfer of Reactive Power at the Onshore Grid Entry Point (or User System Entry Point if Embedded) at all Active Power output levels under steady state voltage conditions. For Onshore Non-Synchronous Generating Units and Onshore Power Park Modules the steady state tolerance on Reactive Power transfer to and from the National Electricity Transmission System expressed in MVAr shall be no greater than 5% of the Rated MW. For Onshore DC Converters the steady state tolerance on Reactive Power transfer to and from the National Electricity Transmission System shall be specified in the Bilateral Agreement.
(c) Subject to the provisions of CC.6.3.2(d) below, all Onshore Non-Synchronous Generating Units, Onshore DC Converters (excluding current source technology) and Onshore Power Park Modules (excluding those connected to the Total System by a current source Onshore DC Converter) with a Completion Date on or after 1 January 2006 must be capable of supplying Rated MW output at any point between the limits 0.95 Power Factor lagging and 0.95 Power Factor leading at the Onshore Grid Entry Point in England and Wales or at the HV side of the 33/132kV or 33/275kV or 33/400kV transformer for Generators directly connected to the Onshore Transmission System in Scotland (or User System Entry Point if Embedded). With all Plant in service, the Reactive Power limits defined at Rated MW at Lagging Power Factor will apply at all Active Power output levels above 20% of the Rated MW output as defined in Figure 1. With all Plant in service, the Reactive Power limits defined at Rated MW at Leading Power Factor will apply at all Active Power output levels above 50% of the Rated MW output as defined in Figure 1. With all Plant in service, the Reactive Power limits will reduce linearly below 50% Active Power output as shown in Figure 1 unless the requirement to maintain the Reactive Power limits defined at Rated MW at Leading Power Factor down to 20% Active Power output is specified in the Bilateral Agreement. These Reactive Power limits will be reduced pro rata to the amount of Plant in service.
Point A is equivalent (in MVAr) to: 0.95 leading Power Factor at Rated MW output
Point B is equivalent (in MVAr) to: 0.95 lagging Power Factor at Rated MW output
Point C is equivalent (in MVAr) to: -5% of Rated MW output
Point D is equivalent (in MVAr) to: +5% of Rated MW output
Point E is equivalent (in MVAr) to: -12% of Rated MW output

Figure 1

(d) All Onshore Non-Synchronous Generating Units and Onshore Power Park Modules in Scotland with a Completion Date after 1 April 2005 and before 1 January 2006 must be capable of supplying Rated MW at the range of power factors either:

(i) from 0.95 lead to 0.95 lag as illustrated in Figure 1 at the User System Entry Point for Embedded Generators or at the HV side of the 33/132kV or 33/275kV or 33/400kV transformer for Generators directly connected to the Onshore Transmission System. With all Plant in service, the Reactive Power limits defined at Rated MW will apply at all Active Power output levels above 20% of the Rated MW output as defined in Figure 1. These Reactive Power limits will be reduced pro rata to the amount of Plant in service.

or,

(ii) from 0.95 lead to 0.90 lag at the Onshore Non-Synchronous Generating Unit (including Power Park Unit) terminals. For the avoidance of doubt Generators complying with this option (ii) are not required to comply with CC.6.3.2(b).

(e) The short circuit ratio of Offshore Synchronous Generating Units at a Large Power Station shall be not less than 0.5. At a Large Power Station all Offshore Synchronous Generating Units, Offshore Non-Synchronous Generating Units, Offshore DC Converters and Offshore Power Park Modules must be capable of maintaining:
(i) zero transfer of Reactive Power at the Offshore Grid Entry Point for all Generators with an Offshore Grid Entry Point at the LV Side of the Offshore Platform at all Active Power output levels under steady state voltage conditions. The steady state tolerance on Reactive Power transfer to and from an Offshore Transmission System expressed in MVAr shall be no greater than 5% of the Rated MW, or

(ii) a transfer of Reactive Power at the Offshore Grid Entry Point at a value specified in the Bilateral Agreement that will be equivalent to zero at the LV Side of the Offshore Platform. In addition, the steady state tolerance on Reactive Power transfer to and from an Offshore Transmission System expressed in MVAr at the LV Side of the Offshore Platform shall be no greater than 5% of the Rated MW, or

(iii) the Reactive Power capability (within associated steady state tolerance) specified in the Bilateral Agreement if any alternative has been agreed with the Generator, Offshore Transmission Licensee and NGET.

CC.6.3.3 Each Generating Unit, DC Converter, Power Park Module and/or CCGT Module must be capable of

(a) continuously maintaining constant Active Power output for System Frequency changes within the range 50.5 to 49.5 Hz; and

(b) (subject to the provisions of CC.6.1.3) maintaining its Active Power output at a level not lower than the figure determined by the linear relationship shown in Figure 2 for System Frequency changes within the range 49.5 to 47 Hz, such that if the System Frequency drops to 47 Hz the Active Power output does not decrease by more than 5%. In the case of a CCGT Module, the above requirement shall be retained down to the Low Frequency Relay trip setting of 48.8 Hz, which reflects the first stage of the Automatic Low Frequency Demand Disconnection scheme notified to Network Operators under OC6.6.2. For System Frequency below that setting, the existing requirement shall be retained for a minimum period of 5 minutes while System Frequency remains below that setting, and special measure(s) that may be required to meet this requirement shall be kept in service during this period. After that 5 minutes period, if System Frequency remains below that setting, the special measure(s) must be discontinued if there is a materially increased risk of the Gas Turbine tripping. The need for special measure(s) is linked to the inherent Gas Turbine Active Power output reduction caused by reduced shaft speed due to falling System Frequency.
(c) For the avoidance of doubt in the case of a Generating Unit or Power Park Module using an Intermittent Power Source where the mechanical power input will not be constant over time, the requirement is that the Active Power output shall be independent of System Frequency under (a) above and should not drop with System Frequency by greater than the amount specified in (b) above.

(d) A DC Converter Station must be capable of maintaining its Active Power input (i.e. when operating in a mode analogous to Demand) from the National Electricity Transmission System (or User System in the case of an Embedded DC Converter Station) at a level not greater than the figure determined by the linear relationship shown in Figure 3 for System Frequency changes within the range 49.5 to 47 Hz, such that if the System Frequency drops to 47.8 Hz the Active Power input decreases by more than 60%.
(e) At a Large Power Station, in the case of an Offshore Generating Unit, Offshore Power Park Module and Offshore DC Converter, the Generator shall comply with the requirements of CC.6.3.3. Generators should be aware that Section K of the STC places requirements on Offshore Transmission Licensees which utilise a Transmission DC Converter as part of their Offshore Transmission System to make appropriate provisions to enable Generators to fulfil their obligations.

CC.6.3.4 At the Grid Entry Point the Active Power output under steady state conditions of any Generating Unit, DC Converter or Power Park Module directly connected to the National Electricity Transmission System should not be affected by voltage changes in the normal operating range specified in paragraph CC.6.1.4 by more than the change in Active Power losses at reduced or increased voltage. In addition:-

(a) For any Offshore Generating Unit, Offshore DC Converter and Offshore Power Park Module the Reactive Power output under steady state conditions should be fully available within the voltage range ±5% at 400kV, 275kV and 132kV and lower voltages, except for an Offshore Power Park Module or Offshore Non-Synchronous Generating Unit if Embedded at 33kV and below (or directly connected to the Offshore Transmission System at 33kV and below) where the requirement shown in Figure 4 applies.

(b) At a Large Power Station, in the case of an Offshore Generating Unit, Offshore DC Converter and Offshore Power Park Module where an alternative reactive capability has been agreed with the Generator, as specified in CC.6.3.2(e) (iii), the voltage / Reactive Power requirement shall be specified in the Bilateral Agreement. The Reactive Power output under steady state conditions shall be fully available within the voltage range ±5% at 400kV, 275kV and 132kV and lower voltages.
Voltage at an Onshore Grid Entry Point or User System Entry Point if Embedded (% of Nominal) at 33 kV and below

CC.6.3.5 It is an essential requirement that the National Electricity Transmission System must incorporate a Black Start Capability. This will be achieved by agreeing a Black Start Capability at a number of strategically located Power Stations. For each Power Station NGET will state in the Bilateral Agreement whether or not a Black Start Capability is required.

Control Arrangements

CC.6.3.6 (a) Each:
   (i) Offshore Generating Unit in a Large Power Station or Onshore Generating Unit; or,
   (ii) Onshore DC Converter with a Completion Date on or after 1 April 2005 or Offshore DC Converter at a Large Power Station; or,
   (iii) Onshore Power Park Module in England and Wales with a Completion Date on or after 1 January 2006; or,
   (iv) Onshore Power Park Module in operation in Scotland on or after 1 January 2006 (with a Completion Date after 1 July 2004 and in a Power Station with a Registered Capacity of 50MW or more); or,
   (v) Offshore Power Park Module in a Large Power Station with a Registered Capacity of 50MW or more,

must be capable of contributing to Frequency control by continuous modulation of Active Power supplied to the National Electricity Transmission System or the User System in which it is Embedded.

(b) Each:
   (i) Offshore Generating Unit; or,
   (ii) Onshore DC Converter (with a Completion Date on or after 1 April 2005 excluding current source technologies); or
(iii) **Onshore Power Park Module** in England and Wales with a **Completion Date** on or after 1 January 2006; or,

(iv) **Onshore Power Park Module** in Scotland irrespective of **Completion Date**; or,

(v) **Offshore Generating Unit** at a **Large Power Station**, **Offshore DC Converter** at a **Large Power Station** or **Offshore Power Park Module** at a **Large Power Station** which provides a reactive range beyond the minimum requirements specified in CC.6.3.2(e) (iii),

must be capable of contributing to voltage control by continuous changes to the **Reactive Power** supplied to the **National Electricity Transmission System** or the **User System** in which it is **Embedded**.

**CC.6.3.7** (a) Each **Generating Unit**, **DC Converter** or **Power Park Module** (excluding **Onshore Power Park Modules** in Scotland with a **Completion Date** before 1 July 2004 or **Onshore Power Park Modules** in a **Power Station** in Scotland with a **Registered Capacity** less than 50MW or **Offshore Power Park Modules** in a **Large Power Station** located **Offshore** with a **Registered Capacity** less than 50MW) must be fitted with a fast acting proportional **Frequency** control device (or turbine speed governor) and unit load controller or equivalent control device to provide **Frequency** response under normal operational conditions in accordance with **Balancing Code 3 (BC3)**. In the case of a **Power Park Module** the frequency or speed control device(s) may be on the **Power Park Module** or on each individual **Power Park Unit** or be a combination of both. The Frequency control device(s) (or speed governor(s)) must be designed and operated to the appropriate:

(i) **European Specification**; or

(ii) in the absence of a relevant **European Specification**, such other standard which is in common use within the European Community (which may include a manufacturer specification);

as at the time when the installation of which it forms part was designed or (in the case of modification or alteration to the **Frequency** control device (or turbine speed governor)) when the modification or alteration was designed.

The **European Specification** or other standard utilised in accordance with sub-paragraph CC.6.3.7 (a) (ii) will be notified to **NGET** by the **Generator** or **DC Converter Station** owner or, in the case of an **Embedded Medium Power Station** not subject to a **Bilateral Agreement** or **Embedded DC Converter Station** not subject to a **Bilateral Agreement**, the relevant **Network Operator**:

(i) as part of the application for a **Bilateral Agreement**; or

(ii) as part of the application for a varied **Bilateral Agreement**; or

(iii) in the case of an **Embedded Development**, within 28 days of entry into the **Embedded Development Agreement** (or such later time as agreed with **NGET**); or

(iv) as soon as possible prior to any modification or alteration to the **Frequency** control device (or governor); and
(b) The Frequency control device (or speed governor) in co-ordination with other control devices must control the Generating Unit, DC Converter or Power Park Module Active Power Output with stability over the entire operating range of the Generating Unit, DC Converter or Power Park Module; and

(c) The Frequency control device (or speed governor) must meet the following minimum requirements:

(i) Where a Generating Unit, DC Converter or Power Park Module becomes isolated from the rest of the Total System but is still supplying Customers, the Frequency control device (or speed governor) must also be able to control System Frequency below 52Hz unless this causes the Generating Unit, DC Converter or Power Park Module to operate below its Designed Minimum Operating Level when it is possible that it may, as detailed in BC 3.7.3, trip after a time. For the avoidance of doubt the Generating Unit, DC Converter or Power Park Module is only required to operate within the System Frequency range 47 - 52 Hz as defined in CC.6.1.3.;

(ii) the Frequency control device (or speed governor) must be capable of being set so that it operates with an overall speed Droop of between 3% and 5%. For the avoidance of doubt, in the case of a Power Park Module the speed Droop should be equivalent of a fixed setting between 3% and 5% applied to each Power Park Unit in service;

(iii) in the case of all Generating Units, DC Converter or Power Park Module other than the Steam Unit within a CCGT Module the Frequency control device (or speed governor) deadband should be no greater than 0.03Hz (for the avoidance of doubt, ±0.015Hz). In the case of the Steam Unit within a CCGT Module, the speed governor deadband should be set to an appropriate value consistent with the requirements of CC.6.3.7(c)(i) and the requirements of BC3.7.2 for the provision of Limited High Frequency Response;

For the avoidance of doubt, the minimum requirements in (ii) and (iii) for the provision of System Ancillary Services do not restrict the negotiation of Commercial Ancillary Services between NGET and the User using other parameters; and

(d) A facility to modify, so as to fulfil the requirements of the Balancing Codes, the Target Frequency setting either continuously or in a maximum of 0.05 Hz steps over at least the range 50 ±0.1 Hz should be provided in the unit load controller or equivalent device.

(e) (i) Each Onshore Generating Unit and/or CCGT Module which has a Completion Date after 1 January 2001 in England and Wales, and after 1 April 2005 in Scotland, must be capable of meeting the minimum Frequency response requirement profile subject to and in accordance with the provisions of Appendix 3.

(ii) Each DC Converter at a DC Converter Station which has a Completion Date on or after 1 April 2005 and each Offshore DC Converter at a Large Power Station must be capable of meeting the minimum Frequency response requirement profile subject to and in accordance with the provisions of Appendix 3.
(iii) Each **Onshore Power Park Module** in operation in England and Wales with a **Completion Date** on or after 1 January 2006 must be capable of meeting the minimum **Frequency** response requirement profile subject to and in accordance with the provisions of Appendix 3.

(iv) Each **Onshore Power Park Module** in operation on or after 1 January 2006 in Scotland (with a **Completion Date** on or after 1 April 2005 and a **Registered Capacity** of 50MW or more) must be capable of meeting the minimum **Frequency** response requirement profile subject to and in accordance with the provisions of Appendix 3.

(v) Each **Offshore Generating Unit** in a **Large Power Station** must be capable of meeting the minimum **Frequency** response requirement profile subject to and in accordance with the provisions of Appendix 3.

(vi) Each **Offshore Power Park Module** in a **Large Power Station** with a **Registered Capacity** of 50 MW or greater, must be capable of meeting the minimum **Frequency** response requirement profile subject to and in accordance with the provisions of Appendix 3.

(vii) Subject to the requirements of CC.6.3.7(e), **Offshore Generating Units** at a **Large Power Station**, **Offshore Power Park Modules** at a **Large Power Station** and **Offshore DC Converters** in a **Large Power Station** shall comply with the requirements of CC.6.3.7. **Generators** should be aware that Section K of the STC places requirements on **Offshore Transmission Licensees** which utilise a **Transmission DC Converter** as part of their **Offshore Transmission System** to make appropriate provisions to enable **Generators** to fulfil their obligations.

(f) For the avoidance of doubt, the requirements of Appendix 3 do not apply to:

(i) **Generating Units** and/or **CCGT Modules** which have a **Completion Date** before 1 January 2001 in England and Wales, and before 1 April 2005 in Scotland, for whom the remaining requirements of this clause CC.6.3.7 shall continue to apply unchanged; or

(ii) **DC Converters** at a **DC Converter Station** which have a **Completion Date** before 1 April 2005; or

(iii) **Onshore Power Park Modules** in England and Wales with a **Completion Date** before 1 January 2006 for whom only the requirements of **Limited Frequency Sensitive Mode** (BC.3.5.2) operation shall apply; or

(iv) **Onshore Power Park Modules** in operation in Scotland before 1 January 2006 for whom only the requirements of **Limited Frequency Sensitive Mode** (BC.3.5.2) operation shall apply; or

(v) **Onshore Power Park Modules** in operation after 1 January 2006 in Scotland which have a **Completion Date** before 1 April 2005 for whom the remaining requirements of this clause CC.6.3.7 shall continue to apply unchanged; or
(vi) Offshore Power Park Modules which are in a Large Power Station with a Registered Capacity less than 50MW for whom only the requirements of Limited Frequency Sensitive Mode (BC.3.5.2) operation shall apply.

Excitation and Voltage Control Performance Requirements

CC.6.3.8 (a) Excitation and voltage control performance requirements applicable to Onshore Generating Units, Onshore Power Park Modules and Onshore DC Converters.

(i) A continuously-acting automatic excitation control system is required to provide constant terminal voltage control of the Onshore Synchronous Generating Unit without instability over the entire operating range of the Onshore Generating Unit.

(ii) In respect of Onshore Synchronous Generating Units with a Completion Date before 1 January 2009, the requirements for excitation control facilities, including Power System Stabilisers, where in NGET’s view these are necessary for system reasons, will be specified in the Bilateral Agreement. If any Modification to the excitation control facilities of such Onshore Synchronous Generating Units is made on or after 1 January 2009 the requirements that shall apply may be specified in the Bilateral Agreement as varied. To the extent that the Bilateral Agreement does not specify, the requirements given or referred to in CC.A.6 shall apply. The performance requirements for a continuously acting automatic excitation control system that shall be complied with by the User in respect of such Onshore Synchronous Generating Units with a Completion Date on or after 1 January 2009 are given or referred to in CC.A.6. Reference is made to on-load commissioning witnessed by NGET in BC2.11.2.

(iii) In the case of an Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module a continuously-acting automatic control system is required to provide control of the voltage (or zero transfer of Reactive Power as applicable to CC.6.3.2) at the Onshore Grid Entry Point or User System Entry Point without instability over the entire operating range of the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module. Any Plant or Apparatus used in the provisions of such voltage control within an Onshore Power Park Module may be located at the Power Park Unit terminals, an appropriate intermediate busbar or the Connection Point. In the case of an Onshore Power Park Module in Scotland with a Completion Date before 1 January 2009, voltage control may be at the Power Park Unit terminals, an appropriate intermediate busbar or the Connection Point as specified in the Bilateral Agreement. When operating below 20% Rated MW the automatic control system may continue to provide voltage control utilising any available reactive capability. If voltage control is not being provided the automatic control system shall be designed to ensure a smooth transition between the shaded area bound by CD and the non shaded area bound by AB in Figure 1 of CC6.3.2 (c).

(iv) The performance requirements for a continuously acting automatic voltage control system in respect of Onshore Power Park Modules,
Onshore Non-Synchronous Generating Units and Onshore DC Converters with a Completion Date before 1 January 2009 will be specified in the Bilateral Agreement. If any Modification to the continuously acting automatic voltage control system of such Onshore Power Park Modules, Onshore Non-Synchronous Generating Units and Onshore DC Converters is made on or after 1 January 2009 the requirements that shall apply may be specified in the Bilateral Agreement as varied. To the extent that the Bilateral Agreement does not specify, the requirements given or referred to in CC.A.7 shall apply. The performance requirements for a continuously acting automatic voltage control system that shall be complied with by the User in respect of Onshore Power Park Modules, Onshore Non-Synchronous Generating Units and Onshore DC Converters with a Completion Date on or after 1 January 2009 are given or referred to in CC.A.7.

(v) In particular, other control facilities, including constant Reactive Power output control modes and constant Power Factor control modes (but excluding VAR limiters) are not required. However, if present in the excitation or voltage control system they will be disabled unless the Bilateral Agreement records otherwise. Operation of such control facilities will be in accordance with the provisions contained in BC2.

(b) Excitation and voltage control performance requirements applicable to Offshore Generating Units at a Large Power Station, Offshore Power Park Modules at a Large Power Station and Offshore DC Converters at a Large Power Station.

A continuously acting automatic control system is required to provide either:-

(i) control of Reactive Power (as specified in CC.6.3.2(e) (i) (ii)) at the Offshore Grid Entry Point without instability over the entire operating range of the Offshore Generating Unit, Offshore DC Converter or Offshore Power Park Module. The performance requirements for this automatic control system will be specified in the Bilateral Agreement or;

(ii) where an alternative reactive capability has been specified in the Bilateral Agreement, in accordance with CC.6.3.2 (e) (iii), the Offshore Generating Unit, Offshore Power Park Module or Offshore DC Converter will be required to control voltage and / or Reactive Power without instability over the entire operating range of the Offshore Generating Unit, Offshore Power Park Module or Offshore DC Converter. The performance requirements of the control system will be specified in the Bilateral Agreement.

In addition to CC.6.3.8(b) (i) and (ii) the requirements for excitation control facilities, including Power System Stabilisers, where in NGET’s view these are necessary for system reasons, will be specified in the Bilateral Agreement. Reference is made to onload commissioning witnessed by NGET in BC2.11.2.

Steady state Load Inaccuracies
CC.6.3.9 The standard deviation of Load error at steady state Load over a 30 minute period must not exceed 2.5 per cent of a Genset’s Registered Capacity. Where a Genset is instructed to Frequency sensitive operation, allowance will be made in determining whether there has been an error according to the governor droop characteristic registered under the PC.

For the avoidance of doubt in the case of a Power Park Module allowance will be made for the full variation of mechanical power output.

Negative Phase Sequence Loadings

CC.6.3.10 In addition to meeting the conditions specified in CC.6.1.5(b), each Synchronous Generating Unit will be required to withstand, without tripping, the negative phase sequence loading incurred by clearance of a close-up phase-to-phase fault, by System Back-Up Protection on the National Electricity Transmission System or User System located Onshore in which it is Embedded.

Neutral Earthing

CC.6.3.11 At nominal System voltages of 132kV and above the higher voltage windings of a transformer of a Generating Unit, DC Converter or Power Park Module must be star connected with the star point suitable for connection to earth. The earthing and lower voltage winding arrangement shall be such as to ensure that the Earth Fault Factor requirement of paragraph CC.6.2.1.1 (b) will be met on the National Electricity Transmission System at nominal System voltages of 132kV and above.

Frequency Sensitive Relays

CC.6.3.12 As stated in CC.6.1.3, the System Frequency could rise to 52Hz or fall to 47Hz. Each Generating Unit, DC Converter, Power Park Module or any constituent element must continue to operate within this Frequency range for at least the periods of time given in CC.6.1.3 unless NGET has agreed to any Frequency-level relays and/or rate-of-change-of-Frequency relays which will trip such Generating Unit, DC Converter, Power Park Module and any constituent element within this Frequency range, under the Bilateral Agreement.

CC.6.3.13 Generators and DC Converter Station owners will be responsible for protecting all their Generating Units, DC Converters or Power Park Modules against damage should Frequency excursions outside the range 52Hz to 47Hz ever occur. Should such excursions occur, it is up to the Generator or DC Converter Station owner to decide whether to disconnect his Apparatus for reasons of safety of Apparatus, Plant and/or personnel.

CC.6.3.14 It may be agreed in the Bilateral Agreement that a Genset shall have a Fast-Start Capability. Such Gensets may be used for Operating Reserve and their Start-Up may be initiated by Frequency-level relays with settings in the range 49Hz to 50Hz as specified pursuant to OC2.

CC.6.3.15 Fault Ride Through

This section sets out the fault ride through requirements on Generating Units, Power Park Modules and DC Converters, Onshore Generating Units, Onshore Power Park Modules and Onshore DC Converters (including Embedded Medium Power Stations and Embedded DC Converter Stations not subject to a Bilateral Agreement and with an Onshore User System Entry Point (irrespective of whether they are located Onshore or Offshore)) are required to operate through System
faults and disturbances as defined in CC.6.3.15.1 (a), CC.6.3.15.1 (b) and CC.6.3.15.3. Offshore Generating Units at a Large Power Station, Offshore Power Park Modules at a Large Power Station and Offshore DC Converters at a Large Power Station shall have the option of meeting either:-

i) CC.6.3.15.1 (a), CC.6.3.15.1 (b) and CC.6.3.15.3, or:-

ii) CC.6.3.15.2 (a), CC.6.3.15.2 (b) and CC.6.3.15.3

Offshore Generators and Offshore DC Converter owners, should notify NGET which option they wish to select within 28 days (or such longer period as NGET may agree, in any event this being no later than 3 months before the Completion Date of the offer for a final CUSC Contract which would be made following the appointment of the Offshore Transmission Licensee).

CC.6.3.15.1 Fault Ride through applicable to Generating Units, Power Park Modules and DC Converters

(a) Short circuit faults on the Onshore Transmission System (which may include an Interface Point) at Supergrid Voltage up to 140ms in duration.

(i) Each Generating Unit, DC Converter, or Power Park Module and any constituent Power Park Unit thereof shall remain transiently stable and connected to the System without tripping of any Generating Unit, DC Converter or Power Park Module and / or any constituent Power Park Unit, for a close-up solid three-phase short circuit fault or any unbalanced short circuit fault on the Onshore Transmission System operating at Supergrid Voltages for a total fault clearance time of up to 140 ms. A solid three-phase or unbalanced earthed fault results in zero voltage on the faulted phase(s) at the point of fault. The duration of zero voltage is dependent on local protection and circuit breaker operating times. This duration and the fault clearance times will be specified in the Bilateral Agreement. Following fault clearance, recovery of the Supergrid Voltage on the Onshore Transmission System to 90% may take longer than 140ms as illustrated in Appendix 4A Figures CC.A.4A.1 (a) and (b). It should be noted that in the case of an Offshore Generating Unit, Offshore DC Converter or Offshore Power Park Module (including any Offshore Power Park Unit thereof) which is connected to an Offshore Transmission System which includes a Transmission DC Converter as part of that Offshore Transmission System, the Offshore Grid Entry Point voltage may not indicate the presence of a fault on the Onshore Transmission System. The fault will affect the level of Active Power that can be transferred to the Onshore Transmission System and therefore subject the Offshore Generating Unit, Offshore DC Converter or Offshore Power Park Module (including any Offshore Power Park Unit thereof) to a load rejection.

(ii) Each Generating Unit or Power Park Module shall be designed such that upon both clearance of the fault on the Onshore Transmission System as detailed in CC.6.3.15.1 (a) (i) and within 0.5 seconds of the restoration of the voltage at the Onshore Grid Entry Point (for Onshore Generating Units and Onshore Power Park Modules) or Interface Point (for Offshore Generating Units and Offshore Power Park Modules) to the minimum levels specified in CC.6.1.4 (or within 0.5 seconds of restoration of the voltage at the User System Entry
Point to 90% of nominal or greater if Embedded), Active Power output shall be restored to at least 90% of the level available immediately before the fault. Once the Active Power output has been restored to the required level, Active Power oscillations shall be acceptable provided that:

- the total Active Energy delivered during the period of the oscillations is at least that which would have been delivered if the Active Power was constant

- the oscillations are adequately damped

During the period of the fault as detailed in CC.6.3.15.1 (a) (i) for which the voltage at the Grid Entry Point is outside the limits specified in CC.6.1.4, each Generating Unit or Power Park Module shall generate maximum reactive current without exceeding the transient rating limit of the Generating Unit or Power Park Module and / or any constituent Power Park Unit.

(iii) Each DC Converter shall be designed to meet the Active Power recovery characteristics as specified in the Bilateral Agreement upon clearance of the fault on the Onshore Transmission System as detailed in CC.6.3.15.1 (a) (i).

(b) Supergrid Voltage dips on the Onshore Transmission System greater than 140ms in duration

In addition to the requirements of CC.6.3.15.1 (a) each Generating Unit or Power Park Module and / or any constituent Power Park Unit, each with a Completion Date on or after the 1 April 2005 shall:

(i) remain transiently stable and connected to the System without tripping of any Generating Unit or Power Park Module and / or any constituent Power Park Unit, for balanced Supergrid Voltage dips and associated durations on the Onshore Transmission System (which could be at the Interface Point) anywhere on or above the heavy black line shown in Figure 5. Appendix 4A and Figures CC.A.4A.3 (a), (b) and (c) provide an explanation and illustrations of Figure 5; and,
(ii) provide Active Power output, during Supergrid Voltage dips on the Onshore Transmission System as described in Figure 5, at least in proportion to the retained balanced voltage at the Onshore Grid Entry Point (for Onshore Generating Units and Onshore Power Park Modules) or Interface Point (for Offshore Generating Units and Offshore Power Park Modules) (or the retained balanced voltage at the User System Entry Point if Embedded) except in the case of a Non-Synchronous Generating Unit or Power Park Module where there has been a reduction in the Intermittent Power Source in the time range in Figure 5 that restricts the Active Power output below this level and shall generate maximum reactive current (where the voltage at the Grid Entry Point is outside the limits specified in CC.6.1.4) without exceeding the transient rating limits of the Generating Unit or Power Park Module and any constituent Power Park Unit; and,

(iii) restore Active Power output, following Supergrid Voltage dips on the Onshore Transmission System as described in Figure 5, within 1 second of restoration of the voltage at the:-

Onshore Grid Entry Point for directly connected Onshore Generating Units and Onshore Power Park Modules or,
Interface Point for Offshore Generating Units and Offshore Power Park Modules or,
User System Entry Point for Embedded Onshore Generating Units and Embedded Onshore Power Park Modules or,
User System Entry Point for Embedded Medium Power Stations and Embedded DC Converter Stations not subject to a Bilateral Agreement and with an Onshore User System Entry Point (irrespective of whether they are located Onshore or Offshore)

to the minimum levels specified in CC.6.1.4 to at least 90% of the level available immediately before the occurrence of the dip except in the case of a Non-Synchronous Generating Unit or Power Park Module where there has been a reduction in the Intermittent Power Source in the

Figure 5
time range in Figure 5 that restricts the **Active Power** output below this level. Once the **Active Power** output has been restored to the required level, **Active Power** oscillations shall be acceptable provided that:

- the total **Active Energy** delivered during the period of the oscillations is at least that which would have been delivered if the **Active Power** was constant
- the oscillations are adequately damped.

For the avoidance of doubt a balanced **Onshore Transmission System Supergrid Voltage** meets the requirements of CC.6.1.5 (b) and CC.6.1.6.

**CC.6.3.15.2** Fault Ride Through applicable to **Offshore Generating Units at a Large Power Station, Offshore Power Park Modules at a Large Power Station** and **Offshore DC Converters at a Large Power Station** who choose to meet the fault ride through requirements at the **LV side of the Offshore Platform**

(a) Requirements on **Offshore Generating Units, Offshore Power Park Modules** and **Offshore DC Converters** to withstand voltage dips on the **LV Side of the Offshore Platform** for up to 140ms in duration as a result of faults and / or voltage dips on the **Onshore Transmission System** operating at **Supergrid Voltage**

(i) Each **Offshore Generating Unit, Offshore DC Converter, or Offshore Power Park Module** and any constituent **Power Park Unit** thereof shall remain transiently stable and connected to the **System** without tripping of any **Offshore Generating Unit, Offshore DC Converter** or **Offshore Power Park Module** and / or any constituent **Power Park Unit**, for any balanced or unbalanced voltage dips on the **LV Side of the Offshore Platform** whose profile is anywhere on or above the heavy black line shown in Figure 6. For the avoidance of doubt, the profile beyond 140ms in Figure 6 shows the minimum recovery in voltage that will be seen by the generator following clearance of the fault at 140ms. Appendix 4B and Figures CC.A.4B.2 (a) and (b) provide further illustration of the voltage recovery profile that may be seen. It should be noted that in the case of an **Offshore Generating Unit, Offshore DC Converter** or **Offshore Power Park Module** (including any **Offshore Power Park Unit** thereof) which is connected to an **Offshore Transmission System** which includes a **Transmission DC Converter** as part of that **Offshore Transmission System**, the **Offshore Grid Entry Point** voltage may not indicate the presence of a fault on the **Onshore Transmission System**. The voltage dip will affect the level of **Active Power** that can be transferred to the **Onshore Transmission System** and therefore subject the **Offshore Generating Unit, Offshore DC Converter** or **Offshore Power Park Module** (including any **Offshore Power Park Unit** thereof) to a load rejection.
V/V_N is the ratio of the actual voltage on one or more phases at the LV Side of the Offshore Platform to the nominal voltage of the LV Side of the Offshore Platform.

Figure 6

(ii) Each Offshore Generating Unit, or Offshore Power Park Module and any constituent Power Park Unit thereof shall provide Active Power output, during voltage dips on the LV Side of the Offshore Platform as described in Figure 6, at least in proportion to the retained voltage at the LV Side of the Offshore Platform except in the case of an Offshore Non-Synchronous Generating Unit or Offshore Power Park Module where there has been a reduction in the Intermittent Power Source in the time range in Figure 6 that restricts the Active Power output below this level and shall generate maximum reactive current without exceeding the transient rating limits of the Offshore Generating Unit or Offshore Power Park Module and any constituent Power Park Unit. Once the Active Power output has been restored to the required level, Active Power oscillations shall be acceptable provided that:

- the total Active Energy delivered during the period of the oscillations is at least that which would have been delivered if the Active Power was constant

- the oscillations are adequately damped

and;

(iii) Each Offshore DC Converter shall be designed to meet the Active Power recovery characteristics as specified in the
Bilateral Agreement upon restoration of the voltage at the LV Side of the Offshore Platform.

(b) Requirements of Offshore Generating Units, Offshore Power Park Modules to withstand voltage dips on the LV Side of the Offshore Platform greater than 140ms in duration.

In addition to the requirements of CC.6.3.15.2. (a) each Offshore Generating Unit or Offshore Power Park Module and / or any constituent Power Park Unit, shall:

(i) remain transiently stable and connected to the System without tripping of any Offshore Generating Unit or Offshore Power Park Module and / or any constituent Power Park Unit, for any balanced voltage dips on the LV side of the Offshore Platform and associated durations anywhere on or above the heavy black line shown in Figure 7. Appendix 4B and Figures CC.A.4B.3. (a), (b) and (c) provide an explanation and illustrations of Figure 7. It should be noted that in the case of an Offshore Generating Unit, or Offshore Power Park Module (including any Offshore Power Park Unit thereof) which is connected to an Offshore Transmission System which includes a Transmission DC Converter as part of that Offshore Transmission System, the Offshore Grid Entry Point voltage may not indicate the presence of a voltage dip on the Onshore Transmission System. The voltage dip will affect the level of Active Power that can be transferred to the Onshore Transmission System and therefore subject the Offshore Generating Unit, or Offshore Power Park Module (including any Offshore Power Park Unit thereof) to a load rejection.

(ii) provide Active Power output, during voltage dips on the LV Side of the Offshore Platform as described in Figure 7, at least in proportion to the retained balanced or unbalanced voltage at the LV Side of the

![Figure 7](image-url)
Offshore Platform except in the case of an Offshore Non-Synchronous Generating Unit or Offshore Power Park Module where there has been a reduction in the Intermittent Power Source in the time range in Figure 7 that restricts the Active Power output below this level and shall generate maximum reactive current (where the voltage at the Offshore Grid Entry Point is outside the limits specified in CC.6.1.4) without exceeding the transient rating limits of the Offshore Generating Unit or Offshore Power Park Module and any constituent Power Park Unit; and,

(iii) within 1 second of the restoration of the voltage at the LV Side of the Offshore Platform (to the minimum levels specified in CC.6.1.4) restore Active Power to at least 90% of the Offshore Generating Unit's or Offshore Power Park Module's immediate pre-disturbed value, unless there has been a reduction in the Intermittent Power Source in the time range in Figure 7 that restricts the Active Power output below this level. Once the Active Power output has been restored to the required level, Active Power oscillations shall be acceptable provided that:

- the total Active Energy delivered during the period of the oscillations is at least that which would have been delivered if the Active Power was constant

- the oscillations are adequately damped
CC.6.3.15.3 Other Requirements

(i) In the case of a Power Park Module (comprising of wind-turbine generator units), the requirements in CC.6.3.15.1 and CC.6.3.15.2 do not apply when the Power Park Module is operating at less than 5% of its Rated MW or during very high wind speed conditions when more than 50% of the wind turbine generator units in a Power Park Module have been shut down or disconnected under an emergency shutdown sequence to protect User’s Plant and Apparatus.

(ii) In addition to meeting the conditions specified in CC.6.1.5(b) and CC.6.1.6, each Non-Synchronous Generating Unit or Power Park Module with a Completion Date after 1 April 2005 and any constituent Power Park Unit thereof will be required to withstand, without tripping, the negative phase sequence loading incurred by clearance of a close-up phase-to-phase fault, by System Back-Up Protection on the Onshore Transmission System operating at Supergrid Voltage.

(iii) In the case of an Onshore Power Park Module in Scotland with a Completion Date before 1 January 2004 and a Registered Capacity less than 30MW the requirements in CC.6.3.15.1 (a) do not apply. In the case of an Onshore Power Park Module in Scotland with a Completion Date on or after 1 January 2004 and before 1 July 2005 and a Registered Capacity less than 30MW the requirements in CC.6.3.15.1 (a) are relaxed from the minimum Onshore Transmission System Supergrid Voltage of zero to a minimum Onshore Transmission System Supergrid Voltage of 15% of nominal. In the case of an Onshore Power Park Module in Scotland with a Completion Date before 1 January 2004 and a Registered Capacity of 30MW and above the requirements in CC.6.3.15.1 (a) are relaxed from the minimum Onshore Transmission System Supergrid Voltage of zero to a minimum Onshore Transmission System Supergrid Voltage of 15% of nominal.

(iv) To avoid unwanted island operation, Non-Synchronous Generating Units in Scotland (and those directly connected to a Scottish Offshore Transmission System), or Power Park Modules in Scotland (and those directly connected to a Scottish Offshore Transmission System) shall be tripped for the following conditions:–

1. Frequency above 52Hz for more than 2 seconds
2. Frequency below 47Hz for more than 2 seconds
3. Voltage as measured at the Onshore Connection Point or Onshore User System Entry Point or Offshore Grid Entry Point is below 80% for more than 2 seconds
4. Voltage as measured at the Onshore Connection Point or Onshore User System Entry Point or Offshore Grid Entry Point is above 120% (115% for 275kV) for more than 1 second.

The times in sections (1) and (2) are maximum trip times. Shorter times may be used to protect the Non-Synchronous Generating Units or Power Park Modules.
Additional Damping Control Facilities for DC Converters

CC.6.3.16
(a) DC Converter owners or Network Operators in the case of an Embedded DC Converter Station not subject to a Bilateral Agreement must ensure that any of their Onshore DC Converters will not cause a sub-synchronous resonance problem on the Total System. Each DC Converter is required to be provided with sub-synchronous resonance damping control facilities.

(b) Where specified in the Bilateral Agreement, each DC Converter is required to be provided with power oscillation damping or any other identified additional control facilities.

System to Generator Operational Intertripping Scheme

CC.6.3.17
NGET may require that a System to Generator Operational Intertripping Scheme be installed as part of a condition of the connection of the Generator. Scheme specific details shall be included in the relevant Bilateral Agreement and shall, in respect of Bilateral Agreements entered into on or after 16th March 2009 include the following information:

1. the relevant category(ies) of the scheme (referred to as Category 1 Intertripping Scheme, Category 2 Intertripping Scheme, Category 3 Intertripping Scheme and Category 4 Intertripping Scheme);

2. the Generating Unit(s) or CCGT Module(s) or Power Park Module(s) to be either permanently armed or that can be instructed to be armed in accordance with BC2.8;

3. the time within which the Generating Unit(s) or CCGT Module(s) or Power Park Module(s) circuit breaker(s) are to be automatically tripped;

4. the location to which the trip signal will be provided by NGET. Such location will be provided by NGET prior to the commissioning of the Generating Unit(s) or CCGT Module(s) or Power Park Module(s).

Where applicable, the Bilateral Agreement shall include the conditions on the National Electricity Transmission System during which NGET may instruct the System to Generator Operational Intertripping Scheme to be armed and the conditions that would initiate a trip signal.

CC.6.3.18
The time within which the Generating Unit(s) or CCGT Module or Power Park Module circuit breaker(s) need to be automatically tripped is determined by the specific conditions local to the Generator. This ‘time to trip’ (defined as time from provision of the trip signal by NGET to the specified location, to circuit breaker main contact opening) can typically range from 100ms to 10sec. A longer time to trip may allow the initiation of an automatic reduction in the Generating Unit(s) or CCGT Module(s) or Power Park Module(s) output prior to the automatic tripping of the Generating Unit(s) or CCGT Module(s) or Power Park Module(s) circuit breaker. Where applicable NGET may provide separate trip signals to allow for either a longer or shorter ‘time to trip’ to be initiated.

CC.6.4 GENERAL NETWORK OPERATOR AND NON-EMBEDDED CUSTOMER REQUIREMENTS

CC.6.4.1
This part of the Grid Code describes the technical and design criteria and performance requirements for Network Operators and Non-Embedded Customers.

Neutral Earthing
CC.6.4.2 At nominal System voltages of 132kV and above the higher voltage windings of three phase transformers and transformer banks connected to the National Electricity Transmission System must be star connected with the star point suitable for connection to earth. The earthing and lower voltage winding arrangement shall be such as to ensure that the Earth Fault Factor requirement of paragraph CC.6.2.1.1 (b) will be met on the National Electricity Transmission System at nominal System voltages of 132kV and above.

**Frequency Sensitive Relays**

CC.6.4.3 As explained under OC6, each Network Operator, will make arrangements that will facilitate automatic low Frequency Disconnection of Demand (based on Annual ACS Conditions). CC.A.5.5. of Appendix 5 includes specifications of the local percentage Demand that shall be disconnected at specific frequencies. The manner in which Demand subject to low Frequency disconnection will be split into discrete MW blocks is specified in OC6.6. Technical requirements relating to Low Frequency Relays are also listed in Appendix 5.

**Operational Metering**

CC.6.4.4 Where NGET can reasonably demonstrate that an Embedded Medium Power Station or Embedded DC Converter Station has a significant effect on the National Electricity Transmission System, it may require the Network Operator within whose System the Embedded Medium Power Station or Embedded DC Converter Station is situated to ensure that the operational metering equipment described in CC.6.5.6 is installed such that NGET can receive the data referred to in CC.6.5.6. In the case of an Embedded Medium Power
Station subject to, or proposed to be subject to a Bilateral Agreement NGET shall notify such Network Operator of the details of such installation in writing within 3 months of being notified of the application to connect under CUSC and in the case of an Embedded Medium Power Station not subject to, or not proposed to be subject to a Bilateral Agreement in writing as a Site Specific Requirement in accordance with the timescales in CUSC 6.5.5. In either case the Network Operator shall ensure that the data referred to in CC.6.5.6 is provided to NGET.

CC.6.5 COMMUNICATIONS PLANT

CC.6.5.1 In order to ensure control of the National Electricity Transmission System, telecommunications between Users and NGET must, if required by NGET, be established in accordance with the requirements set down below.

CC.6.5.2 Control Telephony and System Telephony

CC.6.5.2.1 Control Telephony is the principle method by which a User's Responsible Engineer/Operator and NGET Control Engineers speak to one another for the purposes of control of the Total System in both normal and emergency operating conditions. Control Telephony provides secure point to point telephony for routine Control Calls, priority Control Calls and emergency Control Calls.

CC.6.5.2.2 System Telephony is an alternate method by which a User's Responsible Engineer/Operator and NGET Control Engineers speak to one another for the purposes of control of the Total System in both normal operating conditions and where practicable, emergency operating conditions. System Telephony uses the Public Switched Telephony Network to provide telephony for Control Calls, inclusive of emergency Control Calls.

CC.6.5.2.3 Calls made and received over Control Telephony and System Telephony may be recorded and subsequently replayed for commercial and operational reasons.

CC.6.5.3 Supervisory Tones

CC.6.5.3.1 Control Telephony supervisory tones indicate to the calling and receiving parties dial, engaged, ringing, secondary engaged (signifying that priority may be exercised) and priority disconnect tones.

CC.6.5.3.2 System Telephony supervisory tones indicate to the calling and receiving parties dial, engaged and ringing tones.

CC.6.5.4 Obligations in respect of Control Telephony and System Telephony

CC.6.5.4.1 Where NGET requires Control Telephony, Users are required to use the Control Telephony with NGET in respect of all Connection Points with the National Electricity Transmission System and in respect of all Embedded Large Power Stations and Embedded DC Converter Stations. NGET will install Control Telephony at the User's Control Point where the User's telephony equipment is not capable of providing the required facilities or is otherwise incompatible with the Transmission Control Telephony. Details of and relating to the Control Telephony required are contained in the Bilateral Agreement.

CC.6.5.4.2 Where in NGET's sole opinion the installation of Control Telephony is not practicable at a User's Control Point(s), NGET shall specify in the Bilateral
Agreement whether System Telephony is required. Where System Telephony is required by NGET, the User shall ensure that System Telephony is installed.

CC.6.5.4.3 Where System Telephony is installed, Users are required to use the System Telephony with NGET in respect of those Control Point(s) for which it has been installed. Details of and relating to the System Telephony required are contained in the Bilateral Agreement.

CC.6.5.4.4 Where Control Telephony or System Telephony is installed, routine testing of such facilities may be required by NGET (not normally more than once in any calendar month). The User and NGET shall use reasonable endeavours to agree a test programme and where NGET requests the assistance of the User in performing the agreed test programme the User shall provide such assistance.

CC.6.5.4.5 Control Telephony and System Telephony shall only be used for the purposes of operational voice communication between NGET and the relevant User.

CC.6.5.4.6 Control Telephony contains emergency calling functionality to be used for urgent operational communication only. Such functionality enables NGET and Users to utilise a priority call in the event of an emergency. NGET and Users shall only use such priority call functionality for urgent operational communications.

CC.6.5.5 Technical Requirements for Control Telephony and System Telephony

CC.6.5.5.1 Detailed information on the technical interfaces and support requirements for Control Telephony applicable in NGET’s Transmission Area is provided in the Control Telephony Electrical Standard identified in the Annex to the General Conditions. Where additional information, or information in relation to Control Telephony applicable in Scotland, is requested by Users, this will be provided, where possible, by NGET.

CC.6.5.5.2 System Telephony shall consist of a dedicated Public Switched Telephone Network telephone line that shall be installed and configured by the relevant User. NGET shall provide a dedicated free phone number (UK only), for the purposes of receiving incoming calls to NGET, which Users shall utilise for System Telephony. System Telephony shall only be utilised by the NGET Control Engineer and the User’s Responsible Engineer/Operator for the purposes of operational communications.

Operational Metering

CC.6.5.6 (a) NGET shall provide system control and data acquisition (SCADA) outstation interface equipment. The User shall provide such voltage, current, Frequency, Active Power and Reactive Power measurement outputs and plant status indications and alarms to the Transmission SCADA outstation interface equipment as required by NGET in accordance with the terms of the Bilateral Agreement.

(b) For the avoidance of doubt, for Active Power and Reactive Power measurements, circuit breaker and disconnector status indications from:

(i) CCGT Modules at Large Power Stations, the outputs and status indications must each be provided to NGET on an individual CCGT Unit basis. In addition, where identified in the Bilateral Agreement, Active Power and Reactive Power measurements from Unit Transformers and/or Station Transformers must be provided.
(ii) **DC Converters at DC Converter Stations**, the outputs and status indications must each be provided to NGET on an individual DC Converter basis. In addition, where identified in the Bilateral Agreement, Active Power and Reactive Power measurements from converter and/or station transformers must be provided.

(iii) **Power Park Modules at Embedded Large Power Stations** and at directly connected Power Stations, the outputs and status indications must each be provided to NGET on an individual Power Park Module basis. In addition, where identified in the Bilateral Agreement, Active Power and Reactive Power measurements from station transformers must be provided.

(c) For the avoidance of doubt, the requirements of CC.6.5.6(a) in the case of a Cascade Hydro Scheme will be provided for each Generating Unit forming part of that Cascade Hydro Scheme. In the case of Embedded Generating Units forming part of a Cascade Hydro Scheme the data may be provided by means other than a NGET SCADA outstation located at the Power Station, such as, with the agreement of the Network Operator in whose system such Embedded Generating Unit is located, from the Network Operator's SCADA system to NGET. Details of such arrangements will be contained in the relevant Bilateral Agreements between NGET and the Generator and the Network Operator.

(d) In the case of a Power Park Module an additional energy input signal (e.g. wind speed) may be specified in the Bilateral Agreement. The signal may be used to establish the level of energy input from the Intermittent Power Source for monitoring pursuant to CC.6.6.1 and Ancillary Services and will, in the case of a wind farm, be used to provide NGET with advanced warning of excess wind speed shutdown.

**Instructor Facilities**

CC.6.5.7 The User shall accommodate Instructor Facilities provided by NGET for the receipt of operational messages relating to System conditions.

**Electronic Data Communication Facilities**

CC.6.5.8 (a) All BM Participants must ensure that appropriate electronic data communication facilities are in place to permit the submission of data, as required by the Grid Code, to NGET.

(b) In addition, any User that wishes to participate in the Balancing Mechanism must ensure that appropriate automatic logging devices are installed at the Control Points of its BM Units to submit data to and to receive instructions from NGET, as required by the Grid Code. For the avoidance of doubt, in the case of an Interconnector User the Control Point will be at the Control Centre of the appropriate Externally Interconnected System Operator.

(c) Detailed specifications of these required electronic facilities will be provided by NGET on request and they are listed as Electrical Standards in the Annex to the General Conditions.

**Facsimile Machines**
Each User and NGET shall provide a facsimile machine or machines:

(a) in the case of Generators, at the Control Point of each Power Station and at its Trading Point;

(b) in the case of NGET and Network Operators, at the Control Centre(s); and

(c) in the case of Non-Embedded Customers and DC Converter Station owners at the Control Point.

Each User shall notify, prior to connection to the System of the User's Plant and Apparatus, NGET of its or their telephone number or numbers, and will notify NGET of any changes. Prior to connection to the System of the User's Plant and Apparatus NGET shall notify each User of the telephone number or numbers of its facsimile machine or machines and will notify any changes.

Busbar Voltage

NGET shall, subject as provided below, provide each Generator or DC Converter Station owner at each Grid Entry Point where one of its Power Stations or DC Converter Stations is connected with appropriate voltage signals to enable the Generator or DC Converter Station owner to obtain the necessary information to permit its Gensets or DC Converters to be Synchronised to the National Electricity Transmission System. The term "voltage signal" shall mean in this context, a point of connection on (or wire or wires from) a relevant part of Transmission Plant and/or Apparatus at the Grid Entry Point, to which the Generator or DC Converter Station owner, with NGET's agreement (not to be unreasonably withheld) in relation to the Plant and/or Apparatus to be attached, will be able to attach its Plant and/or Apparatus (normally a wire or wires) in order to obtain measurement outputs in relation to the busbar.

Bilingual Message Facilities

(a) A Bilingual Message Facility is the method by which the User's Responsible Engineer/Operator, the Externally Interconnected System Operator and NGET Control Engineers communicate clear and unambiguous information in two languages for the purposes of control of the Total System in both normal and emergency operating conditions.

(b) A Bilingual Message Facility, where required, will provide up to two hundred pre-defined messages with up to five hundred and sixty characters each. A maximum of one minute is allowed for the transmission to, and display of, the selected message at any destination. The standard messages must be capable of being displayed at any combination of locations and can originate from any of these locations. Messages displayed in the UK will be displayed in the English language.

(c) Detailed information on a Bilingual Message Facility and suitable equipment required for individual User applications will be provided by NGET upon request.

SYSTEM MONITORING

Monitoring equipment is provided on the National Electricity Transmission System to enable NGET to monitor its power system dynamic conditions.
Where this monitoring equipment requires voltage and current signals on the **Generating Unit** (other than **Power Park Unit**), **DC Converter** or **Power Park Module** circuit from the **User**, NGET will inform the **User** and they will be provided by the **User** with both the timing of the installation of the equipment for receiving such signals and its exact position being agreed (the **User's** agreement not to be unreasonably withheld) and the costs being dealt with, pursuant to the terms of the **Bilateral Agreement**.

**CC.7 SITE RELATED CONDITIONS**

**CC.7.1** Not used.

**CC.7.2 RESPONSIBILITIES FOR SAFETY**

**CC.7.2.1** In England and Wales, any **User** entering and working on its **Plant** and/or **Apparatus** on a **Transmission Site** will work to the **Safety Rules** of NGET.

In Scotland or **Offshore**, any **User** entering and working on its **Plant** and/or **Apparatus** on a **Transmission Site** will work to the **Safety Rules** of the **Relevant Transmission Licensee**, as advised by NGET.

**CC.7.2.2** NGET entering and working on **Transmission Plant** and/or **Apparatus** on a **User Site** will work to the **User's Safety Rules**. For **User Sites** in Scotland or **Offshore**, NGET shall procure that the **Relevant Transmission Licensee** entering and working on **Transmission Plant** and/or **Apparatus** on a **User Site** will work to the **User's Safety Rules**.

**CC.7.2.3** A **User** may, with a minimum of six weeks notice, apply to NGET for permission to work according to that **User's** own **Safety Rules** when working on its **Plant** and/or **Apparatus** on a **Transmission Site** rather than the **User's Safety Rules** set out in CC.7.2.1. If NGET is of the opinion that the **User's Safety Rules** provide for a level of safety commensurate with that of the **User's Safety Rules**, it will notify NGET, in writing, that, with the effect from the date requested by the **User**, the **User** may use its own **Safety Rules** when working on its **Plant** and/or **Apparatus** on the **Transmission Site**. For a **Transmission Site** in Scotland or **Offshore**, in forming its opinion, NGET will seek the opinion of the **Relevant Transmission Licensee**. Until receipt of such written approval from NGET, the **User** will continue to use the **Safety Rules** as set out in CC.7.2.1.

**CC.7.2.4** In the case of a **User Site** in Scotland or **Offshore**, NGET may, with a minimum of six weeks notice, apply to a **User** for permission to work according to **NGET's Safety Rules** when working on **Transmission Plant** and/or **Apparatus** on that **User Site**, rather than the **User's Safety Rules**. If the **User** is of the opinion that **NGET's Safety Rules** provide for a level of safety commensurate with that of the **User's Safety Rules**, it will notify NGET, in writing, that, with the effect from the date requested by NGET, NGET may use its own **Safety Rules** when working on its **Transmission Plant** and/or **Apparatus** on that **User Site**. Until receipt of such written approval from the **User**, NGET shall continue to use the **User's Safety Rules**.

In the case of a **User Site** in England and Wales, NGET may, with a minimum of six weeks notice, apply to a **User** for permission for the **Relevant Transmission Licensee** to work according to the **Relevant Transmission Licensee's Safety Rules** when working on **Transmission Plant** and/or **Apparatus** on that **User Site**, rather than the **User's Safety Rules**. If the **User** is of the opinion that the **Relevant Transmission Licensee's Safety Rules** provide for a level of safety...
commensurate with that of that User's Safety Rules, it will notify NGET, in writing, that, with effect from the date requested by NGET, that the Relevant Transmission Licensee may use its own Safety Rules when working on its Transmission Plant and/or Apparatus on that User’s Site. Until receipt of such written approval from the User, NGET shall procure that the Relevant Transmission Licensee shall continue to use the User's Safety Rules.

CC.7.2.5
For a Transmission Site in England and Wales, if NGET gives its approval for the User's Safety Rules to apply to the User when working on its Plant and/or Apparatus, that does not imply that the User's Safety Rules will apply to entering the Transmission Site and access to the User's Plant and/or Apparatus on that Transmission Site. Bearing in mind NGET's responsibility for the whole Transmission Site, entry and access will always be in accordance with NGET's site access procedures. For a User Site in England and Wales, if the User gives its approval for NGET's Safety Rules to apply to NGET when working on its Plant and Apparatus, that does not imply that NGET's Safety Rules will apply to entering the User Site, and access to the Transmission Plant and Apparatus on that User Site. Bearing in mind the User's responsibility for the whole User Site, entry and access will always be in accordance with the User's site access procedures.

For a Transmission Site in Scotland or Offshore, if NGET gives its approval for the User's Safety Rules to apply to the User when working on its Plant and/or Apparatus, that does not imply that the User's Safety Rules will apply to entering the Transmission Site and access to the User’s Plant and/or Apparatus on that Transmission Site. Bearing in mind the Relevant Transmission Licensee’s responsibility for the whole Transmission Site, entry and access will always be in accordance with the Relevant Transmission Licensee's site access procedures. For a User Site in Scotland or Offshore, if the User gives its approval for Relevant Transmission Licensee Safety Rules to apply to the Relevant Transmission Licensee when working on its Plant and Apparatus, that does not imply that the Relevant Transmission Licensee's Safety Rules will apply to entering the User Site, and access to the Transmission Plant and Apparatus on that User Site. Bearing in mind the User’s responsibility for the whole User Site, entry and access will always be in accordance with the User's site access procedures.

CC.7.2.6
For User Sites in England and Wales, Users shall notify NGET of any Safety Rules that apply to NGET’s staff working on User Sites. For Transmission Sites in England and Wales, NGET shall notify Users of any Safety Rules that apply to the User's staff working on the Transmission Site.

For User Sites in Scotland or Offshore, Users shall notify NGET of any Safety Rules that apply to the Relevant Transmission Licensee’s staff working on User Sites. For Transmission Sites in Scotland or Offshore NGET shall procure that the Relevant Transmission Licensee shall notify Users of any Safety Rules that apply to the User's staff working on the Transmission Site.

CC.7.2.7
Each Site Responsibility Schedule must have recorded on it the Safety Rules which apply to each item of Plant and/or Apparatus.

CC.7.3
SITE RESPONSIBILITY SCHEDULES

CC.7.3.1
In order to inform site operational staff and NGET Control Engineers of agreed responsibilities for Plant and/or Apparatus at the operational interface, a Site Responsibility Schedule shall be produced for Connection Sites in England and Wales for NGET and Users with whom they interface, and for Connection Sites in
Scotland or Offshore for NGET, the Relevant Transmission Licensee and Users with whom they interface.

CC.7.3.2 The format, principles and basic procedure to be used in the preparation of Site Responsibility Schedules are set down in Appendix 1.

CC.7.4 OPERATION AND GAS ZONE DIAGRAMS

Operation Diagrams

CC.7.4.1 An Operation Diagram shall be prepared for each Connection Site at which a Connection Point exists using, where appropriate, the graphical symbols shown in Part 1A of Appendix 2. Users should also note that the provisions of OC11 apply in certain circumstances.

CC.7.4.2 The Operation Diagram shall include all HV Apparatus and the connections to all external circuits and incorporate numbering, nomenclature and labelling, as set out in OC11. At those Connection Sites where gas-insulated metal enclosed switchgear and/or other gas-insulated HV Apparatus is installed, those items must be depicted within an area delineated by a chain dotted line which intersects gas-zone boundaries. The nomenclature used shall conform with that used on the relevant Connection Site and circuit. The Operation Diagram (and the list of technical details) is intended to provide an accurate record of the layout and circuit interconnections, ratings and numbering and nomenclature of HV Apparatus and related Plant.

CC.7.4.3 A non-exhaustive guide to the types of HV Apparatus to be shown in the Operation Diagram is shown in Part 2 of Appendix 2, together with certain basic principles to be followed unless equivalent principles are approved by NGET.

Gas Zone Diagrams

CC.7.4.4 A Gas Zone Diagram shall be prepared for each Connection Site at which a Connection Point exists where gas-insulated switchgear and/or other gas-insulated HV Apparatus is utilised. They shall use, where appropriate, the graphical symbols shown in Part 1B of Appendix 2.

CC.7.4.5 The nomenclature used shall conform with that used in the relevant Connection Site and circuit.

CC.7.4.6 The basic principles set out in Part 2 of Appendix 2 shall be followed in the preparation of Gas Zone Diagrams unless equivalent principles are approved by NGET.

Preparation of Operation and Gas Zone Diagrams for Users' Sites

CC.7.4.7 In the case of a User Site, the User shall prepare and submit to NGET, an Operation Diagram for all HV Apparatus on the User side of the Connection Point and NGET shall provide the User with an Operation Diagram for all HV Apparatus on the Transmission side of the Connection Point, in accordance with the timing requirements of the Bilateral Agreement and/or Construction Agreement prior to the Completion Date under the Bilateral Agreement and/or Construction Agreement.

CC.7.4.8 The User will then prepare, produce and distribute, using the information submitted on the User's Operation Diagram and NGET Operation Diagram, a composite
Operation Diagram for the complete Connection Site, also in accordance with the timing requirements of the Bilateral Agreement and/or Construction Agreement.

CC.7.4.9 The provisions of CC7.4.7 and CC.7.4.8 shall apply in relation to Gas Zone Diagrams where gas-insulated switchgear and/or other gas-insulated HV Apparatus is utilised.

Preparation of Operation and Gas Zone Diagrams for Transmission Sites

CC.7.4.10 In the case of an Transmission Site, the User shall prepare and submit to NGET an Operation Diagram for all HV Apparatus on the User side of the Connection Point, in accordance with the timing requirements of the Bilateral Agreement and/or Construction Agreement.

CC.7.4.11 NGET will then prepare, produce and distribute, using the information submitted on the User's Operation Diagram, a composite Operation Diagram for the complete Connection Site, also in accordance with the timing requirements of the Bilateral Agreement and/or Construction Agreement.

CC.7.4.12 The provisions of CC7.4.10 and CC.7.4.11 shall apply in relation to Gas Zone Diagrams where gas-insulated switchgear and/or other gas-insulated HV Apparatus is utilised.

CC.7.4.13 Changes to Operation and Gas Zone Diagrams

CC.7.4.13.1 When NGET has decided that it wishes to install new HV Apparatus or it wishes to change the existing numbering or nomenclature of Transmission HV Apparatus at a Transmission Site, NGET will (unless it gives rise to a Modification under the CUSC, in which case the provisions of the CUSC as to the timing apply) one month prior to the installation or change, send to each such User a revised Operation Diagram of that Transmission Site, incorporating the new Transmission HV Apparatus to be installed and its numbering and nomenclature or the changes, as the case may be. OC11 is also relevant to certain Apparatus.

CC.7.4.13.2 When a User has decided that it wishes to install new HV Apparatus, or it wishes to change the existing numbering or nomenclature of its HV Apparatus at its User Site, the User will (unless it gives rise to a Modification under the CUSC, in which case the provisions of the CUSC as to the timing apply) one month prior to the installation or change, send to NGET a revised Operation Diagram of that User Site incorporating the new User HV Apparatus to be installed and its numbering and nomenclature or the changes as the case may be. OC11 is also relevant to certain Apparatus.

CC.7.4.13.3 The provisions of CC7.4.13.1 and CC.7.4.13.2 shall apply in relation to Gas Zone Diagrams where gas-insulated switchgear and/or other gas-insulated HV Apparatus is installed.

Validity

CC.7.4.14 (a) The composite Operation Diagram prepared by NGET or the User, as the case may be, will be the definitive Operation Diagram for all operational and planning activities associated with the Connection Site. If a dispute arises as to the accuracy of the composite Operation Diagram, a meeting shall be held at the Connection Site, as soon as reasonably practicable, between NGET and the User, to endeavour to resolve the matters in dispute.
(b) An equivalent rule shall apply for Gas Zone Diagrams where they exist for a Connection Site.

CC.7.5 SITE COMMON DRAWINGS

CC.7.5.1 Site Common Drawings will be prepared for each Connection Site and will include Connection Site layout drawings, electrical layout drawings, common Protection/control drawings and common services drawings.

Preparation of Site Common Drawings for a User Site

CC.7.5.2 In the case of a User Site, NGET shall prepare and submit to the User, Site Common Drawings for the Transmission side of the Connection Point in accordance with the timing requirements of the Bilateral Agreement and/or Construction Agreement.

CC.7.5.3 The User will then prepare, produce and distribute, using the information submitted on the Transmission Site Common Drawings, Site Common Drawings for the complete Connection Site in accordance with the timing requirements of the Bilateral Agreement and/or Construction Agreement.

Preparation of Site Common Drawings for a Transmission Site

CC.7.5.4 In the case of a Transmission Site, the User will prepare and submit to NGET Site Common Drawings for the User side of the Connection Point in accordance with the timing requirements of the Bilateral Agreement and/or Construction Agreement.

CC.7.5.5 NGET will then prepare, produce and distribute, using the information submitted in the User's Site Common Drawings, Site Common Drawings for the complete Connection Site in accordance with the timing requirements of the Bilateral Agreement and/or Construction Agreement.

CC.7.5.6 When a User becomes aware that it is necessary to change any aspect of the Site Common Drawings at a Connection Site it will:

(a) if it is a User Site, as soon as reasonably practicable, prepare, produce and distribute revised Site Common Drawings for the complete Connection Site; and

(b) if it is a Transmission Site, as soon as reasonably practicable, prepare and submit to NGET revised Site Common Drawings for the User side of the Connection Point and NGET will then, as soon as reasonably practicable, prepare, produce and distribute, using the information submitted in the User's Site Common Drawings, revised Site Common Drawings for the complete Connection Site.

In either case, if in the User's reasonable opinion the change can be dealt with by it notifying NGET in writing of the change and for each party to amend its copy of the Site Common Drawings (or where there is only one set, for the party holding that set to amend it), then it shall so notify and each party shall so amend. If the change gives rise to a Modification under the CUSC, the provisions of the CUSC as to timing will apply.

CC.7.5.7 When NGET becomes aware that it is necessary to change any aspect of the Site Common Drawings at a Connection Site it will:
(a) if it is a Transmission Site, as soon as reasonably practicable, prepare, produce and distribute revised Site Common Drawings for the complete Connection Site; and

(b) if it is a User Site, as soon as reasonably practicable, prepare and submit to the User revised Site Common Drawings for the Transmission side of the Connection Point and the User will then, as soon as reasonably practicable, prepare, produce and distribute, using the information submitted in the Transmission Site Common Drawings, revised Site Common Drawings for the complete Connection Site.

In either case, if in NGET's reasonable opinion the change can be dealt with by it notifying the User in writing of the change and for each party to amend its copy of the Site Common Drawings (or where there is only one set, for the party holding that set to amend it), then it shall so notify and each party shall so amend. If the change gives rise to a Modification under the CUSC, the provisions of the CUSC as to timing will apply.

Validity

CC.7.5.8 The Site Common Drawings for the complete Connection Site prepared by the User or NGET, as the case may be, will be the definitive Site Common Drawings for all operational and planning activities associated with the Connection Site. If a dispute arises as to the accuracy of the Site Common Drawings, a meeting shall be held at the Site, as soon as reasonably practicable, between NGET and the User, to endeavour to resolve the matters in dispute.

CC.7.6 ACCESS

CC.7.6.1 The provisions relating to access to Transmission Sites by Users, and to Users' Sites by Transmission Licensees, are set out in each Interface Agreement with, for Transmission Sites in England and Wales, NGET and each User, and for Transmission Sites in Scotland and Offshore, the Relevant Transmission Licensee and each User.

CC.7.6.2 In addition to those provisions, where a Transmission Site in England and Wales contains exposed HV conductors, unaccompanied access will only be granted to individuals holding an Authority for Access issued by NGET and where a Transmission Site in Scotland or Offshore contains exposed HV conductors, unaccompanied access will only be granted to individuals holding an Authority for Access issued by the Relevant Transmission Licensee.

CC.7.6.3 The procedure for applying for an Authority for Access is contained in the Interface Agreement.

CC.7.7 MAINTENANCE STANDARDS

CC.7.7.1 It is a requirement that all User's Plant and Apparatus on Transmission Sites is maintained adequately for the purpose for which it is intended and to ensure that it does not pose a threat to the safety of any Transmission Plant, Apparatus or personnel on the Transmission Site. NGET will have the right to inspect the test results and maintenance records relating to such Plant and Apparatus at any time. In Scotland or Offshore, it is the User's responsibility to ensure that all the User's Plant and Apparatus, including protection systems, are tested and maintained and
remain rated for the duty required. An annual update of system fault levels is available as part of the Seven Year Statement.

CC.7.7.2 It is a requirement that all Transmission Plant and Apparatus on User's Sites is maintained adequately for the purposes for which it is intended and to ensure that it does not pose a threat to the safety of any of the User's Plant, Apparatus or personnel on the User Site. Users will have the right to inspect the test results and maintenance records relating to such Plant and Apparatus, at any time.

CC.7.8 SITE OPERATIONAL PROCEDURES

CC.7.8.1 NGET and Users with an interface with NGET, must make available staff to take necessary Safety Precautions and carry out operational duties as may be required to enable work/testing to be carried out and for the operation of Plant and Apparatus connected to the Total System.

CC.7.9 Generators and DC Converter Station owners shall provide a Control Point in respect of each Power Station directly connected to the National Electricity Transmission System and Embedded Large Power Station or DC Converter Station to receive an act upon instructions pursuant to OC7 and BC2 at all times that Generating Units or Power Park Modules at the Power Station are generating or available to generate or DC Converters at the DC Converter Station are importing or exporting or available to do so. The Control Point shall be continuously manned except where the Bilateral Agreement in respect of such Embedded Power Station specifies that compliance with BC2 is not required, where the Control Point shall be manned between the hours of 0800 and 1800 each day.
ANCILLARY SERVICES

System Ancillary Services

The CC contain requirements for the capability for certain Ancillary Services, which are needed for System reasons ("System Ancillary Services"). There follows a list of these System Ancillary Services, together with the paragraph number of the CC (or other part of the Grid Code) in which the minimum capability is required or referred to. The list is divided into two categories: Part 1 lists the System Ancillary Services which

(a) Generators in respect of Large Power Stations are obliged to provide (except Generators in respect of Large Power Stations which have a Registered Capacity of less than 50MW and comprise Power Park Modules); and,

(b) Generators in respect of Large Power Stations which a Registered Capacity of less than 50MW and comprise Power Park Modules are obliged to provide in respect of Reactive Power only; and,

(c) DC Converter Station owners are obliged to have the capability to supply; and

(d) Generators in respect of Medium Power Stations (except Embedded Medium Power Stations) are obliged to provide in respect of Reactive Power only:

and Part 2 lists the System Ancillary Services which Generators will provide only if agreement to provide them is reached with NGET:

Part 1

(a) Reactive Power supplied (in accordance with CC.6.3.2) otherwise than by means of synchronous or static compensators (except in the case of a Power Park Module where synchronous or static compensators within the Power Park Module may be used to provide Reactive Power)

(b) Frequency Control by means of Frequency sensitive generation - CC.6.3.7 and BC3.5.1

Part 2

(c) Frequency Control by means of Fast Start - CC.6.3.14

(d) Black Start Capability - CC.6.3.5

(e) System to Generator Operational Intertripping

Commercial Ancillary Services

Other Ancillary Services are also utilised by NGET in operating the Total System if these have been agreed to be provided by a User (or other person) 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 Ancillary Services”). The capability for these Commercial Ancillary Services is set out in the relevant Ancillary Services Agreement or Bilateral Agreement (as the case may be).
CONNECTION CONDITIONS

APPENDIX 1

FORMAT, PRINCIPLES AND BASIC PROCEDURE TO BE USED IN THE
PREPARATION OF SITE RESPONSIBILITY SCHEDULES

CC.A.1.1 PRINCIPLES

Types of Schedules

CC.A.1.1.1 At all Complexes the following Site Responsibility Schedules shall be drawn up using the relevant proforma attached or with such variations as may be agreed between NGET and Users, but in the absence of agreement the relevant proforma attached will be used:

(a) Schedule of HV Apparatus
(b) Schedule of Plant, LV/MV Apparatus, services and supplies;
(c) Schedule of telecommunications and measurements Apparatus.

Other than at Generating Unit, DC Converter, Power Park Module and Power Station locations, the schedules referred to in (b) and (c) may be combined.

New Connection Sites

CC.A.1.1.2 In the case of a new Connection Site each Site Responsibility Schedule for a Connection Site shall be prepared by NGET in consultation with relevant Users at least 2 weeks prior to the Completion Date under the Bilateral Agreement and/or Construction Agreement for that Connection Site (which may form part of a Complex). Each User shall, in accordance with the timing requirements of the Bilateral Agreement and/or Construction Agreement, provide information to NGET to enable it to prepare the Site Responsibility Schedule.

Sub-division

CC.A.1.1.3 Each Site Responsibility Schedule will be subdivided to take account of any separate Connection Sites on that Complex.

Scope

CC.A.1.1.4 Each Site Responsibility Schedule shall detail for each item of Plant and Apparatus:-

(a) Plant/Apparatus ownership;
(b) Site Manager (Controller) (except in the case of Plant/Apparatus located in SPT’s Transmission Area);
(c) Safety issues comprising applicable Safety Rules and Control Person or other responsible person (Safety Co-ordinator), or such other person who is responsible for safety;
(d) Operations issues comprising applicable Operational Procedures and control engineer;

(e) Responsibility to undertake statutory inspections, fault investigation and maintenance.

Each Connection Point shall be precisely shown.

**Detail**

CC.A.1.1.5 (a) In the case of Site Responsibility Schedules referred to in CC.A.1.1.1(b) and (c), with the exception of Protection Apparatus and Intertrip Apparatus operation, it will be sufficient to indicate the responsible User or Transmission Licensee, as the case may be.

(b) In the case of the Site Responsibility Schedule referred to in CC.A.1.1.1(a) and for Protection Apparatus and Intertrip Apparatus, the responsible management unit must be shown in addition to the User or Transmission Licensee, as the case may be.

CC.A.1.1.6 The HV Apparatus Site Responsibility Schedule for each Connection Site must include lines and cables emanating from or traversing the Connection Site.

**Issue Details**

CC.A.1.1.7 Every page of each Site Responsibility Schedule shall bear the date of issue and the issue number.

**Accuracy Confirmation**

CC.A.1.1.8 When a Site Responsibility Schedule is prepared it shall be sent by NGET to the Users involved for confirmation of its accuracy.

CC.A.1.1.9 The Site Responsibility Schedule shall then be signed on behalf of NGET by its Responsible Manager (see CC.A.1.1.16) and on behalf of each User involved by its Responsible Manager (see CC.A.1.1.16), by way of written confirmation of its accuracy. For Connection Sites in Scotland or Offshore, the Site Responsibility Schedule will also be signed on behalf of the Relevant Transmission Licensee by its Responsible Manager.

**Distribution and Availability**

CC.A.1.1.10 Once signed, two copies will be distributed by NGET, not less than two weeks prior to its implementation date, to each User which is a party on the Site Responsibility Schedule, accompanied by a note indicating the issue number and the date of implementation.

CC.A.1.1.11 NGET and Users must make the Site Responsibility Schedules readily available to operational staff at the Complex and at the other relevant control points.

---

1 Details of circuits traversing the Connection Site are only needed from the date which is the earlier of the date when the Site Responsibility Schedule is first updated and 15th October 2004. In Scotland or Offshore, from a date to be agreed between NGET and the Relevant Transmission Licensee.
Alterations to Existing Site Responsibility Schedules

CC.A 1.1.12 Without prejudice to the provisions of CC.A.1.1.15 which deals with urgent changes, when a User identified on a Site Responsibility Schedule becomes aware that an alteration is necessary, it must inform NGET immediately and in any event 8 weeks prior to any change taking effect (or as soon as possible after becoming aware of it, if less than 8 weeks remain when the User becomes aware of the change). This will cover the commissioning of new Plant and/or Apparatus at the Connection Site, whether requiring a revised Bilateral Agreement or not, de-commissioning of Plant and/or Apparatus, and other changes which affect the accuracy of the Site Responsibility Schedule.

CC.A 1.1.13 Where NGET has been informed of a change by a User, or itself proposes a change, it will prepare a revised Site Responsibility Schedule by not less than six weeks prior to the change taking effect (subject to it having been informed or knowing of the change eight weeks prior to that time) and the procedure set out in CC.A.1.1.8 shall be followed with regard to the revised Site Responsibility Schedule.

CC.A 1.1.14 The revised Site Responsibility Schedule shall then be signed in accordance with the procedure set out in CC.A.1.1.9 and distributed in accordance with the procedure set out in CC.A.1.1.10, accompanied by a note indicating where the alteration(s) has/have been made, the new issue number and the date of implementation.

Urgent Changes

CC.A.1.1.15 When a User identified on a Site Responsibility Schedule, or NGET, as the case may be, becomes aware that an alteration to the Site Responsibility Schedule is necessary urgently to reflect, for example, an emergency situation which has arisen outside its control, the User shall notify NGET, or NGET shall notify the User, as the case may be, immediately and will discuss:

(a) what change is necessary to the Site Responsibility Schedule;

(b) whether the Site Responsibility Schedule is to be modified temporarily or permanently;

(c) the distribution of the revised Site Responsibility Schedule.

NGET will prepare a revised Site Responsibility Schedule as soon as possible, and in any event within seven days of it being informed of or knowing the necessary alteration. The Site Responsibility Schedule will be confirmed by Users and signed on behalf of NGET and Users (by the persons referred to in CC.A.1.1.9) as soon as possible after it has been prepared and sent to Users for confirmation.

Responsible Managers

CC.A.1.1.16 Each User shall, prior to the Completion Date under each Bilateral Agreement and/or Construction Agreement, supply to NGET a list of Managers who have been duly authorised to sign Site Responsibility Schedules on behalf of the User and NGET shall, prior to the Completion Date under each Bilateral Agreement and/or Construction Agreement, supply to that User the name of its Responsible Manager and for Connection Sites in Scotland or Offshore, the name of the Relevant Transmission Licensee’s Responsible Manager and each shall supply to the other any changes to such list six weeks before the change takes effect.
where the change is anticipated, and as soon as possible after the change, where
the change was not anticipated.

**De-commissioning of Connection Sites**

CC.A.1.1.17 Where a **Connection Site** is to be de-commissioned, whichever of **NGET** or the
**User** who is initiating the de-commissioning must contact the other to arrange for
the **Site Responsibility Schedule** to be amended at the relevant time.
ATTACHMENT TO APPENDIX 1 OF CONNECTION CONDITIONS

PROFORMA FOR SITE RESPONSIBILITY SCHEDULE

_________________ AREA

COMPLEX: ___________________________ SCHEDULE: ________

CONNECTION SITE: __________________

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<th>PLANT APPARATUS OWNER</th>
<th>SITE MANAGER</th>
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<th>CONTROL OR OTHER RESPONSIBLE PERSON (SAFETY COORDINATOR)</th>
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PAGE: _______ ISSUE NO: ________ DATE: ________________
ATTACHMENT TO APPENDIX 1 OF CONNECTION CONDITIONS

PROFORMA FOR SITE RESPONSIBILITY SCHEDULE

_________________ AREA

COMPLEX: ___________________ SCHEDULE: ________

CONNECTION SITE: __________

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NOTES:

SIGNED: __________________ NAME: __________________ COMPANY: ______________ DATE: ______________

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PAGE: ______ ISSUE NO: ________ DATE: ______________
### SP TRANSMISSION Ltd
### SITE RESPONSIBILITY SCHEDULE
### OWNERSHIP, MAINTENANCE AND OPERATIONS OF EQUIPMENT
### IN JOINT USER SITUATIONS

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#### SECTION 'B' CUSTOMER OR OTHER PARTY

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### Scottish Hydro-Electric Transmission Limited

#### Site Responsibility Schedule

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CONNECTION CONDITIONS

APPENDIX 2

PART 1A

PROCEDURES RELATING TO OPERATION DIAGRAMS
PORTABLE MAINTENANCE EARTH DEVICE

QUADRATURE BOOSTER

SHORTING/DISCHARGE SWITCH

CAPACITOR (INCLUDING HARMONIC FILTER)

SINGLE PHASE TRANSFORMER (BR) NEUTRAL AND PHASE CONNECTIONS

RESISTOR WITH INHERENT NON-LINEAR VARIABILITY, VOLTAGE DEPENDANT

DISCONNECTOR (PANTOGRAPH TYPE)

DISCONNECTOR (KNEE TYPE)
CONNECTION CONDITIONS

APPENDIX 2

PART 1B

PROCEDURES RELATING TO GAS ZONE DIAGRAMS

- GAS INSULATED BUSBAR
- DOUBLE-BREAK DISCONNECTOR
- EXTERNAL MOUNTED CURRENT TRANSFORMER (WHERE SEPARATE PRIMARY APPARATUS)
- GAS BOUNDARY
- STOP VALVE NORMALLY CLOSED
- GAS/CABLE BOUNDARY
- STOP VALVE NORMALLY OPEN
- GAS/AIR BOUNDARY
- GAS MONITOR
- GAS/TRANSFORMER BOUNDARY
- FILTER
- MAINTENANCE VALVE
- QUICK ACTING COUPLING
CONNECTION CONDITIONS

APPENDIX 2

NON-EXHAUSTIVE LIST OF APPARATUS
TO BE INCLUDED ON OPERATION DIAGRAMS

PART 2

Basic Principles

1. Where practicable, all the HV Apparatus on any Connection Site shall be shown on one Operation Diagram. Provided the clarity of the diagram is not impaired, the layout shall represent as closely as possible the geographical arrangement on the Connection Site.

2. Where more than one Operation Diagram is unavoidable, duplication of identical information on more than one Operation Diagram must be avoided.

3. The Operation Diagram must show accurately the current status of the Apparatus eg. whether commissioned or decommissioned. Where decommissioned, the associated switchbay will be labelled "spare bay".

4. Provision will be made on the Operation Diagram for signifying approvals, together with provision for details of revisions and dates.

5. Operation Diagrams will be prepared in A4 format or such other format as may be agreed with NGET.

6. The Operation Diagram should normally be drawn single line. However, where appropriate, detail which applies to individual phases shall be shown. For example, some HV Apparatus is numbered individually per phase.
APPARATUS TO BE SHOWN ON OPERATION DIAGRAM

1. Busbars
2. Circuit Breakers
3. Disconnector (Isolator) and Switch Disconnecters (Switching Isolators)
4. Disconnectors (Isolators) - Automatic Facilities
5. Bypass Facilities
6. Earthing Switches
7. Maintenance Earths
8. Overhead Line Entries
9. Overhead Line Traps
10. Cable and Cable Sealing Ends
11. Generating Unit
12. Generator Transformers
13. Generating Unit Transformers, Station Transformers, including the lower voltage circuit-breakers.
14. Synchronous Compensators
15. Static Variable Compensators
16. Capacitors (including Harmonic Filters)
17. Series or Shunt Reactors (Referred to as "Inductors" at nuclear power station sites)
18. Supergrid and Grid Transformers
19. Tertiary Windings
20. Earthing and Auxiliary Transformers
21. Three Phase VT's
22. Single Phase VT & Phase Identity
23. High Accuracy VT and Phase Identity
24. Surge Arrestors/Diverter
25. Neutral Earthing Arrangements on HV Plant
26. Fault Throwing Devices
27. Quadrature Boosters
28. Arc Suppression Coils
29. Single Phase Transformers (BR) Neutral and Phase Connections
30. Current Transformers (where separate plant items)
31. Wall Bushings
32. Combined VT/CT Units
33. Shorting and Discharge Switches
34. Thyristor
35. Resistor with Inherent Non-Linear Variability, Voltage Dependent
36. Gas Zone
CONNECTION CONDITIONS

APPENDIX 3

MINIMUM FREQUENCY RESPONSE REQUIREMENT PROFILE AND OPERATING RANGE
for new Power Stations and DC Converter Stations.

CC.A.3.1 SCOPE

The frequency response capability is defined in terms of Primary Response, Secondary Response and High Frequency Response. This appendix defines the minimum frequency response requirement profile for:

(a) each Onshore Generating Unit and/or CCGT Module which has a Completion Date after 1 January 2001 in England and Wales and 1 April 2005 in Scotland and Offshore Generating Unit in a Large Power Station,

(b) each DC Converter at a DC Converter Station which has a Completion Date on or after 1 April 2005 or each Offshore DC Converter which is part of a Large Power Station.

(c) each Onshore Power Park Module in England and Wales with a Completion Date on or after 1 January 2006.

(d) each Onshore Power Park Module in operation in Scotland after 1 January 2006 with a Completion Date after 1 April 2005 and in Power Stations with a Registered Capacity of 50MW or more.

(e) each Offshore Power Park Module in a Large Power Station with a Registered Capacity of 50MW or more.

For the avoidance of doubt, this appendix does not apply to:

(i) Generating Units and/or CCGT Modules which have a Completion Date before 1 January 2001 in England and Wales and before 1 April 2005 in Scotland,

(ii) DC Converters at a DC Converter Station which have a Completion Date before 1 April 2005.

(iii) Power Park Modules in England and Wales with a Completion Date before 1 January 2006.

(iv) Power Park Modules in operation in Scotland before 1 January 2006.

(v) Power Park Modules in Scotland with a Completion Date before 1 April 2005.

(vi) Power Park Modules in Power Stations with a Registered Capacity less than 50MW.

(vii) Small Power Stations or individually to Power Park Units.
The functional definition provides appropriate performance criteria relating to the provision of Frequency control by means of Frequency sensitive generation in addition to the other requirements identified in CC.6.3.7.

In this Appendix 3 to the CC, for a CCGT Module or a Power Park Module with more than one Generating Unit, the phrase Minimum Generation applies to the entire CCGT Module or Power Park Module operating with all Generating Units Synchronised to the System.

The minimum Frequency response requirement profile is shown diagrammatically in Figure CC.A.3.1. The capability profile specifies the minimum required levels of Primary Response, Secondary Response and High Frequency Response throughout the normal plant operating range. The definitions of these Frequency response capabilities are illustrated diagrammatically in Figures CC.A.3.2 & CC.A.3.3.

CC.A.3.2 PLANT OPERATING RANGE

The upper limit of the operating range is the Registered Capacity of the Generating Unit or CCGT Module or DC Converter or Power Park Module.

The Minimum Generation level may be less than, but must not be more than, 65% of the Registered Capacity. Each Generating Unit and/or CCGT Module and/or Power Park Module and/or DC Converter must be capable of operating satisfactorily down to the Designed Minimum Operating Level as dictated by System operating conditions, although it will not be instructed to below its Minimum Generation level. If a Generating Unit or CCGT Module or Power Park Module or DC Converter is operating below Minimum Generation because of high System Frequency, it should recover adequately to its Minimum Generation level as the System Frequency returns to Target Frequency so that it can provide Primary and Secondary Response from Minimum Generation if the System Frequency continues to fall. For the avoidance of doubt, under normal operating conditions steady state operation below Minimum Generation is not expected. The Designed Minimum Operating Level must not be more than 55% of Registered Capacity.

In the event of a Generating Unit or CCGT Module or Power Park Module or DC Converter load rejecting down to no less than its Designed Minimum Operating Level it should not trip as a result of automatic action as detailed in BC3.7. If the load rejection is to a level less than the Designed Minimum Operating Level then it is accepted that the condition might be so severe as to cause it to be disconnected from the System.

CC.A.3.3 MINIMUM FREQUENCY RESPONSE REQUIREMENT PROFILE

Figure CC.A.3.1 shows the minimum Frequency response requirement profile diagrammatically for a 0.5 Hz change in Frequency. The percentage response capabilities and loading levels are defined on the basis of the Registered Capacity of the Generating Unit or CCGT Module or Power Park Module or DC Converter. Each Generating Unit and/or CCGT Module and/or Power Park Module and/or DC Converter must be capable of operating in a manner to provide Frequency response at least to the solid boundaries shown in the figure. If the Frequency response capability falls within the solid boundaries, the Generating Unit or CCGT Module or Power Park Module or DC Converter is providing response below the minimum requirement which is not acceptable. Nothing in this appendix is intended to prevent a Generating Unit or CCGT Module or Power Park Module or DC Converter from being designed to deliver a Frequency response in excess of the identified minimum requirement.
The Frequency response delivered for Frequency deviations of less than 0.5 Hz should be no less than a figure which is directly proportional to the minimum Frequency response requirement for a Frequency deviation of 0.5 Hz. For example, if the Frequency deviation is 0.2 Hz, the corresponding minimum Frequency response requirement is 40% of the level shown in Figure CC.A.3.1. The Frequency response delivered for Frequency deviations of more than 0.5 Hz should be no less than the response delivered for a Frequency deviation of 0.5 Hz.

Each Generating Unit and/or CCGT Module and/or Power Park Module and/or DC Converter must be capable of providing some response, in keeping with its specific operational characteristics, when operating between 95% to 100% of Registered Capacity as illustrated by the dotted lines in Figure CC.A.3.1.

At the Minimum Generation level, each Generating Unit and/or CCGT Module and/or Power Park Module and/or DC Converter is required to provide high and low frequency response depending on the System Frequency conditions. Where the Frequency is high, the Active Power output is therefore expected to fall below the Minimum Generation level.

The Designed Minimum Operating Level is the output at which a Generating Unit and/or CCGT Module and/or Power Park Module and/or DC Converter has no High Frequency Response capability. It may be less than, but must not be more than, 55% of the Registered Capacity. This implies that a Generating Unit or CCGT Module or Power Park Module or DC Converter is not obliged to reduce its output to below this level unless the Frequency is at or above 50.5 Hz (cf BC3.7).

CC.A.3.4 TESTING OF FREQUENCY RESPONSE CAPABILITY

The response capabilities shown diagrammatically in Figure CC.A.3.1 are measured by taking the responses as obtained from some of the dynamic response tests specified by NGET and carried out by Generators and DC Converter Station owners for compliance purposes and to validate the content of Ancillary Services Agreements using an injection of a Frequency change to the plant control system (i.e. governor and load controller). The injected signal is a linear ramp from zero to 0.5 Hz Frequency change over a ten second period, and is sustained at 0.5 Hz Frequency change thereafter, as illustrated diagrammatically in figures CC.A.3.2 and CC.A.3.3. In the case of an Embedded Medium Power Station not subject to a Bilateral Agreement or Embedded DC Converter Station not subject to a Bilateral Agreement, NGET may require the Network Operator within whose System the Embedded Medium Power Station or Embedded DC Converter Station is situated, to ensure that the Embedded Person performs the dynamic response tests reasonably required by NGET in order to demonstrate compliance within the relevant requirements in the CCs.

The Primary Response capability (P) of a Generating Unit or a CCGT Module or Power Park Module or DC Converter is the minimum increase in Active Power output between 10 and 30 seconds after the start of the ramp injection as illustrated diagrammatically in Figure CC.A.3.2. This increase in Active Power output should be released increasingly with time over the period 0 to 10 seconds from the time of the start of the Frequency fall as illustrated by the response from Figure CC.A.3.2.

The Secondary Response capability (S) of a Generating Unit or a CCGT Module or Power Park Module or DC Converter is the minimum increase in Active Power output between 30 seconds and 30 minutes after the start of the ramp injection as illustrated diagrammatically in Figure CC.A.3.2.
The **High Frequency Response** capability (H) of a **Generating Unit** or a **CCGT Module** or **Power Park Module** or **DC Converter** is the decrease in **Active Power** output provided 10 seconds after the start of the ramp injection and sustained thereafter as illustrated diagrammatically in Figure CC.A.3.3. This reduction in **Active Power** output should be released increasingly with time over the period 0 to 10 seconds from the time of the start of the **Frequency** rise as illustrated by the response in Figure CC.A.3.2.

**CC.A.3.5 REPEATABILITY OF RESPONSE**

When a **Generating Unit** or **CCGT Module** or **Power Park Module** or **DC Converter** has responded to a significant **Frequency** disturbance, its response capability must be fully restored as soon as technically possible. Full response capability should be restored no later than 20 minutes after the initial change of **System Frequency** arising from the **Frequency** disturbance.

**Figure CC.A.3.1 - Minimum Frequency Response Requirement Profile for a 0.5 Hz frequency change from Target Frequency**
Figure CC.A.3.2 - Interpretation of Primary and Secondary Response Values

Figure CC.A.3.3 - Interpretation of High Frequency Response Values
APPENDIX 4A

FAULT RIDE THROUGH REQUIREMENTS FOR ONSHORE GENERATING UNITS, ONSHORE POWER PARK MODULES, ONSHORE DC CONVERTERS AND OFFSHORE GENERATING UNITS IN A LARGE POWER STATION, OFFSHORE POWER PARK MODULES IN A LARGE POWER STATION AND OFFSHORE DC CONVERTERS IN A LARGE POWER STATION WHICH SELECT TO MEET THE FAULT RIDE THROUGH REQUIREMENTS AT THE INTERFACE POINT

CC.A.4A.1 SCOPE

The fault ride through requirement is defined in CC.6.3.15.1 (a), (b) and CC.6.3.15.3. This Appendix provides illustrations by way of examples only of CC.6.3.15.1 (a) (i) and further background and illustrations to CC.6.3.15.1 (b) (i) and is not intended to show all possible permutations.

CC.A.4A.2 SHORT CIRCUIT FAULTS AT SUPERGRID VOLTAGE ON THE ONSHORE TRANSMISSION SYSTEM UP TO 140MS IN DURATION

For short circuit faults at Supergrid Voltage on the Onshore Transmission System up to 140ms in duration, the fault ride through requirement is defined in CC.6.3.15.1 (a) (i). Figures CC.A.4A.1 (a) and (b) illustrate two typical examples of voltage recovery for short-circuit faults cleared within 140ms by two circuit breakers (a) and three circuit breakers (b) respectively.

Figure CC.A.4A.1 (a)
CCA.4A.3 **SUPERGRID VOLTAGE DIPS ON THE ONSHORE TRANSMISSION SYSTEM GREATER THAN 140MS IN DURATION**

For balanced Supergrid Voltage dips on the Onshore Transmission System having durations greater than 140ms and up to 3 minutes the fault ride through requirement is defined in CC6.3.15.1 (b) (i) and Figure 5 which is reproduced in this Appendix as Figure CC.A.4A.2 and termed the the voltage–duration profile.

This profile is not a voltage-time response curve that would be obtained by plotting the transient voltage response at a point on the Onshore Transmission System (or User System if located Onshore) to a disturbance. Rather, each point on the profile (ie the heavy black line) represents a voltage level and an associated time duration which connected Generating Units, or Power Park Modules must withstand or ride through.

Figures CC.A.4A.3 (a), (b) and (c) illustrate the meaning of the voltage-duration profile for voltage dips having durations greater than 140ms.
Supergrid Voltage
400/275kV

30% retained voltage, 384ms duration

Figure CC.A.4A.3(a)

Supergrid Voltage
400/275kV

50% retained voltage, 710ms duration

Figure CC.A.4A.3(b)

Supergrid Voltage
400/275kV

85% retained voltage, 3 minutes duration

Figure CC.A.4A.3(c)
APPENDIX 4B

FAULT RIDE THROUGH REQUIREMENTS FOR OFFSHORE GENERATING UNITS IN A LARGE POWER STATION, OFFSHORE POWER PARK MODULES IN A LARGE POWER STATION AND OFFSHORE DC CONVERTERS IN A LARGE POWER STATION WHICH SELECT TO MEET THE FAULT RIDE THROUGH REQUIREMENTS AT THE LV SIDE OF THE OFFSHORE PLATFORM AS SPECIFIED IN CC.6.3.15.2

CC.A.4B.1 SCOPE

The fault ride through requirement is defined in CC.6.3.15.2 (a), (b) and CC.6.3.15.3. This Appendix provides illustrations by way of examples only of CC.6.3.15.2 (a) (i) and further background and illustrations to CC.6.3.15.2 (b) (i) and is not intended to show all possible permutations.

CC.A.4B.2 VOLTAGE DIPS ON THE LV SIDE OF THE OFFSHORE PLATFORM UP TO 140MS IN DURATION

For voltage dips on the LV Side of the Offshore Platform which last up to 140ms in duration, the fault ride through requirement is defined in CC.6.3.15.2 (a) (i). This includes Figure 6 which is reproduced here in Figure CC.A.4B.1. The purpose of this requirement is to translate the conditions caused by a balanced or unbalanced fault which occurs on the Onshore Transmission System (which may include the Interface Point) at the LV Side of the Offshore Platform.

\[ \frac{V}{V_N}(\%) \]

- 100%
- 94%
- 60%
- 15%

0 140ms 500ms Time

V/N is the ratio of the voltage at the LV side of the Offshore Platform to the nominal voltage of the LV side of the Offshore Platform.

Figure CC.A.4B.1

Figures CC.A.4B.2 (a) and CC.A.4B.2 (b) illustrate two typical examples of the voltage recovery seen at the LV Side of the Offshore Platform for a short circuit fault cleared within 140ms by (a) two circuit breakers and (b) three circuit breakers on the Onshore Transmission System.
CCA.4B.3 VOLTAGE DIPS WHICH OCCUR ON THE LV SIDE OF THE OFFSHORE PLATFORM GREATER THAN 140MS IN DURATION

In addition to CCA.4B.2 the fault ride through requirements applicable for Offshore Generating Units, and Offshore Power Park Modules during balanced voltage dips which occur at the LV Side of the Offshore Platform and have durations greater than 140ms and up to 3 minutes are defined in CC.6.3.15.2 (b) (i) and Figure 7 which is reproduced in this Appendix as Figure CCA.A.4B.3 and termed the voltage–duration profile.

This profile is not a voltage-time response curve that would be obtained by plotting the transient voltage response at the LV Side of the Offshore Platform to a disturbance. Rather, each point on the profile (ie the heavy black line) represents a voltage level and an associated time duration which connected Offshore Generating Units, or Offshore Power Park Modules must withstand or ride through.
Figures CC.A.4B.3 (a), (b) and (c) illustrate the meaning of the voltage-duration profile for voltage dips having durations greater than 140ms.
Figure CC.A.4B.3(b)

50% retained voltage, 710ms duration

Figure CC.A.4B.3(c)

85% retained voltage, 3 minutes duration
APPENDIX 5

TECHNICAL REQUIREMENTS

LOW FREQUENCY RELAYS FOR THE AUTOMATIC DISCONNECTION OF SUPPLIES AT LOW FREQUENCY

CC.A.5.1

LOW FREQUENCY RELAYS

CC.A.5.1.1

The Low Frequency Relays to be used shall have a setting range of 47.0 to 50Hz and be suitable for operation from a nominal AC input of 63.5, 110 or 240V. The following general parameters specify the requirements of approved Low Frequency Relays for automatic installations installed and commissioned after 1st April 2007 and provide an indication, without prejudice to the provisions that may be included in a Bilateral Agreement, for those installed and commissioned before 1st April 2007:

(a) **Frequency** settings: 47-50Hz in steps of 0.05Hz or better, preferably 0.01Hz;

(b) **Operating time**: Relay operating time shall not be more than 150 ms;

(c) **Voltage lock-out**: Selectable within a range of 55 to 90% of nominal voltage;

(d) **Facility stages**: One or two stages of Frequency operation;

(e) **Output contacts**: Two output contacts per stage to be capable of repetitively making and breaking for 1000 operations:

(f) **Accuracy** 0.01 Hz maximum error under reference environmental and system voltage conditions. 0.05 Hz maximum error at 8% of total harmonic distortion Electromagnetic Compatibility Level.

CC.A.5.2

LOW FREQUENCY RELAY VOLTAGE SUPPLIES

CC.A.5.2.1

It is essential that the voltage supply to the Low Frequency Relays shall be derived from the primary System at the supply point concerned so that the Frequency of the Low Frequency Relays input voltage is the same as that of the primary System. This requires either:

(a) the use of a secure supply obtained from voltage transformers directly associated with the grid transformer(s) concerned, the supply being obtained where necessary via a suitable automatic voltage selection scheme; or

(b) the use of the substation 240V phase-to-neutral selected auxiliary supply, provided that this supply is always derived at the supply point concerned and is never derived from a standby...
supply Generating Unit or from another part of the User System.

CC.A.5.3 SCHEME REQUIREMENTS

CC.A.5.3.1 The tripping facility should be engineered in accordance with the following reliability considerations:

(a) Dependability

Failure to trip at any one particular Demand shedding point would not harm the overall operation of the scheme. However, many failures would have the effect of reducing the amount of Demand under low Frequency control. An overall reasonable minimum requirement for the dependability of the Demand shedding scheme is 96%, i.e. the average probability of failure of each Demand shedding point should be less than 4%. Thus the Demand under low Frequency control will not be reduced by more than 4% due to relay failure.

(b) Outages

Low Frequency Demand shedding schemes will be engineered such that the amount of Demand under control is as specified in Table CC.A.5.5.1a and is not reduced unacceptably during equipment outage or maintenance conditions.

CC.A.5.3.2 The total operating time of the scheme, including circuit breakers operating time, shall where reasonably practicable, be less than 200 ms. For the avoidance of doubt, the replacement of plant installed prior to October 2009 will not be required in order to achieve lower total scheme operating times.

CC.A.5.4 LOW FREQUENCY RELAY TESTING

CC.A.5.4.1 Low Frequency Relays installed and commissioned after 1st January 2007 shall be type tested in accordance with and comply with the functional test requirements for Frequency Protection contained in Energy Networks Association Technical Specification 48-6-5 Issue 1 dated 2005 “ENA Protection Assessment Functional Test Requirements – Voltage and Frequency Protection”.

For the avoidance of doubt, Low Frequency Relays installed and commissioned before 1st January 2007 shall comply with the version of CC.A.5.1.1 applicable at the time such Low Frequency Relays were commissioned.

CC.A.5.5 SCHEME SETTINGS

CC.A.5.5.1 Table CC.A.5.5.1a shows, for each Transmission Area, the percentage of Demand (based on Annual ACS Conditions) at the time of forecast National Electricity Transmission System peak demand that each Network Operator whose System is connected to the Onshore Transmission System within such Transmission Area shall disconnect by Low Frequency Relays at a range of frequencies. Where a Network Operator's System is connected to the National Electricity Transmission System in more than one Transmission Area, the settings for the
Transmission Area in which the majority of the Demand is connected shall apply.

Table CC.A.5.5.1a

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<th>Frequency Hz</th>
<th>%Demand disconnection for each Network Operator in Transmission Area</th>
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<td>48.8</td>
<td>5</td>
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<td>5</td>
</tr>
<tr>
<td>Total % Demand</td>
<td>60</td>
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</table>

Note – the percentages in table CC.A.5.5.1a are cumulative such that, for example, should the frequency fall to 48.6 Hz in the NGET Transmission Area, 27.5% of the total Demand connected to the National Electricity Transmission System in the NGET Transmission Area shall be disconnected by the action of Low Frequency Relays.

The percentage demand at each stage shall be allocated as far as reasonably practicable. The cumulative total percentage demand is a minimum.
APPENDIX 6

PERFORMANCE REQUIREMENTS FOR CONTINUOUSLY ACTING AUTOMATIC EXCITATION CONTROL SYSTEMS FOR ONSHORE SYNCHRONOUS GENERATING UNITS

CC.A.6.1 SCOPE

CC.A.6.1.1 This Appendix sets out the performance requirements of continuously acting automatic excitation control systems for Onshore Synchronous Generating Units that must be complied with by the User. This Appendix does not limit any site specific requirements that may be included in a Bilateral Agreement where in NGET's reasonable opinion these facilities are necessary for system reasons.

CC.A.6.1.2 Where the requirements may vary the likely range of variation is given in this Appendix. It may be necessary to specify values outside this range where NGET identifies a system need, and notwithstanding anything to the contrary NGET may specify in the Bilateral Agreement values outside of the ranges provided in this Appendix 6. The most common variations are in the on-load excitation ceiling voltage requirements and the response time required of the Exciter. Actual values will be included in the Bilateral Agreement.

CC.A.6.1.3 Should a Generator anticipate making a change to the excitation control system it shall notify NGET under the Planning Code (PC.A.1.2(b) and (c)) as soon as the Generator anticipates making the change. The change may require a revision to the Bilateral Agreement.

CC.A.6.2 Requirements

CC.A.6.2.1 The Excitation System of an Onshore Synchronous Generating Unit shall include an excitation source (Exciter), a Power System Stabiliser and a continuously acting Automatic Voltage Regulator (AVR) and shall meet the following functional specification.

CC.A.6.2.2 In respect of Onshore Synchronous Generating Units with a Completion Date on or after 1 January 2009, and Onshore SynchronousGenerating Units with a Completion Date before 1 January 2009 subject to a Modification to the excitation control facilities where the Bilateral Agreement does not specify otherwise, the continuously acting automatic excitation control system shall include a Power System Stabiliser (PSS) as a means of supplementary control. The functional specification of the Power System Stabiliser is included in CC.A.6.2.5.

CC.A.6.2.3 Steady State Voltage Control

CC.A.6.2.3.1 An accurate steady state control of the Onshore Generating Unit pre-set terminal voltage is required. As a measure of the accuracy of the steady-state voltage control, the Automatic Voltage Regulator shall have static zero frequency gain, sufficient to limit the change in terminal voltage to a drop not exceeding 0.5% of rated terminal voltage, when the Onshore Generating Unit output is gradually changed from zero to rated MVA output at rated voltage, Active Power and Frequency.

CC.A.6.2.4 Transient Voltage Control

CC.A.6.2.4.1 For a step change from 90% to 100% of the nominal Onshore Generating Unit terminal voltage, with the Onshore Generating Unit on open circuit, the Excitation System response shall have a damped oscillatory characteristic. For this characteristic, the time for the Onshore Generating Unit terminal voltage to first
reach 100% shall be less than 0.6 seconds. Also, the time to settle within 5% of the voltage change shall be less than 3 seconds.

**CC.A.6.2.4.2** To ensure that adequate synchronising power is maintained, when the **Onshore Generating Unit** is subjected to a large voltage disturbance, the **Exciter** whose output is varied by the **Automatic Voltage Regulator** shall be capable of providing its achievable upper and lower limit ceiling voltages to the **Onshore Generating Unit** field in a time not exceeding that specified in the **Bilateral Agreement**. This will normally be no less than 50 ms and not greater than 300 ms. The achievable upper and lower limit ceiling voltages may be dependent on the voltage disturbance.

**CC.A.6.2.4.3** The **Exciter** shall be capable of attaining an **Excitation System On Load Positive Ceiling Voltage** of not less than a value specified in the **Bilateral Agreement** that will be:

- not less than 2 per unit (pu)
- normally not greater than 3 pu
- exceptionally up to 4 pu

of **Rated Field Voltage** when responding to a sudden drop in voltage of 10 percent or more at the **Onshore Generating Unit** terminals. **NGET** may specify a value outside the above limits where **NGET** identifies a system need.

**CC.A.6.2.4.4** If a static type **Exciter** is employed:

(i) the field voltage should be capable of attaining a negative ceiling level specified in the **Bilateral Agreement** after the removal of the step disturbance of **CC.A.6.2.4.3**. The specified value will be 80% of the value specified in **CC.A.6.2.4.3**. **NGET** may specify a value outside the above limits where **NGET** identifies a system need.

(ii) the **Exciter** must be capable of maintaining free firing when the **Onshore Generating Unit** terminal voltage is depressed to a level which may be between 20% to 30% of rated terminal voltage

(iii) the **Exciter** shall be capable of attaining a positive ceiling voltage not less than 80% of the **Excitation System On Load Positive Ceiling Voltage** upon recovery of the **Onshore Generating Unit** terminal voltage to 80% of rated terminal voltage following fault clearance. **NGET** may specify a value outside the above limits where **NGET** identifies a system need.

(iv) The requirement to provide a separate power source for the **Exciter** will be specified in the **Bilateral Agreement** if **NGET** identifies a **Transmission System** need.

**CC.A.6.2.5** Power Oscillations Damping Control

**CC.A.6.2.5.1** To allow the **Onshore Generating Unit** to maintain second and subsequent swing stability and also to ensure an adequate level of low frequency electrical damping power, the **Automatic Voltage Regulator** shall include a **Power System Stabiliser** as a means of supplementary control.

**CC.A.6.2.5.2** Whatever supplementary control signal is employed, it shall be of the type which operates into the **Automatic Voltage Regulator** to cause the field voltage to act in a manner which results in the damping power being improved while maintaining adequate synchronising power.

**CC.A.6.2.5.3** The arrangements for the supplementary control signal shall ensure that the **Power System Stabiliser** output signal relates only to changes in the supplementary control signal and not the steady state level of the signal. For example, if generator electrical power output is chosen as a supplementary control signal then the **Power System**
Stabiliser output should relate only to changes in generator electrical power output and not the steady state level of power output. Additionally the Power System Stabiliser should not react to mechanical power changes in isolation for example during rapid changes in steady state load or when providing frequency response.

CC.A.6.2.5.4 The output signal from the Power System Stabiliser shall be limited to not more than ±10% of the Onshore Generating Unit terminal voltage signal at the Automatic Voltage Regulator input. The gain of the Power System Stabiliser shall be such that an increase in the gain by a factor of 3 shall not cause instability.

CC.A.6.2.5.5 The Power System Stabiliser shall include elements that limit the bandwidth of the output signal. The bandwidth limiting must ensure that the highest frequency of response cannot excite torsional oscillations on other plant connected to the network. A bandwidth of 0-5Hz would be judged to be acceptable for this application.

CC.A.6.2.5.6 The Generator will agree Power System Stabiliser settings with NGET prior to the on-load commissioning detailed in BC2.11.2(d). To allow assessment of the performance before on-load commissioning the Generator will provide to NGET a report containing:

i. the Excitation System model including the Power System Stabiliser with settings as required under the Planning Code (PC.A.5.3.2(c)).

ii. on load time series simulations of the response of the Excitation System with and without the Power System Stabiliser to 2% and 10% steps in the reference voltage and a three phase short circuit fault applied to the higher voltage side of the Generating Unit transformer for 100 ms. The results should show field voltage, Onshore Generating Unit terminal voltage, Power System Stabiliser output and Onshore Generating Unit Active Power and Reactive Power output.

iii. gain and phase Bode diagrams for the open loop frequency domain response of the Onshore Generating Unit Excitation System with and without the Power System Stabiliser. These should be in a format to allow assessment of the phase contribution of the Power System Stabiliser and the gain and phase margin of the Excitation System with the Power System Stabiliser.

CC.A.6.2.5.7 The Power System Stabiliser must be active within the Excitation System at all times when Synchronised including when the Under Excitation Limiter or Over Excitation Limiter are active. When operating at low load when Synchronising or De-Synchronising an Onshore Generating Unit, the Power System Stabiliser may be out of service.

CC.A.6.2.5.8 Where a Power System Stabiliser is fitted to a Pumped Storage Unit it must function when the Pumped Storage Unit is in both generating and pumping modes.

CC.A.6.2.6 Overall Excitation System Control Characteristics

CC.A.6.2.6.1 The overall Excitation System shall include elements that limit the bandwidth of the output signal. The bandwidth limiting must be consistent with the speed of response requirements and ensure that the highest frequency of response cannot excite torsional oscillations on other plant connected to the network. A bandwidth of 0-5 Hz will be judged to be acceptable for this application.

CC.A.6.2.6.2 The response of the Automatic Voltage Regulator combined with the Power System Stabiliser shall be demonstrated by injecting similar step signal disturbances into the Automatic Voltage Regulator reference with the Onshore Generating Unit operating at points specified by NGET (up to rated MVA output).
The damping shall be judged to be adequate if the corresponding Active Power response to the disturbances decays within two cycles of oscillation.

CC.A.6.2.6.3 The frequency domain tuning of the Power System Stabiliser shall also be demonstrated by injecting a 0.2Hz-3Hz band limited random noise signal into the Automatic Voltage Regulator reference with the Onshore Generating Unit operating at points specified by NGET (up to rated MVA output). The tuning of the Power System Stabiliser shall be judged to be adequate if the corresponding Active Power response shows improved damping with the Power System Stabiliser in combination with the Automatic Voltage Regulator compared with the Automatic Voltage Regulator alone over the frequency range 0.3Hz – 2Hz.

CC.A.6.2.7 Under-Excitation Limiters

CC.A.6.2.7.1 The security of the power system shall also be safeguarded by means of MVAr Under Excitation Limiters fitted to the generator Excitation System. The Under Excitation Limiter shall prevent the Automatic Voltage Regulator reducing the generator excitation to a level which would endanger synchronous stability. The Under Excitation Limiter shall operate when the excitation system is providing automatic control. The Under Excitation Limiter shall respond to changes in the Active Power (MW) and the Reactive Power (MVAr), and to the square of the generator voltage in such a direction that an increase in voltage will permit an increase in leading MVAr. The characteristic of the Under Excitation Limiter shall be substantially linear from no-load to the maximum Active Power output of the Onshore Generating Unit at any setting and shall be readily adjustable.

CC.A.6.2.7.2 The performance of the Under Excitation Limiter shall be independent of the rate of change of the Onshore Generating Unit load and shall be demonstrated by testing its response to a step change corresponding to a 2% decrease in Automatic Voltage Regulator reference voltage when the generator is operating just off the limit line, as set up. The resulting maximum overshoot shall not exceed 4% of the Onshore Generating Unit rated MVA. The operating point of the Onshore Generating Unit shall be returned to a steady state value at the limit line and the final settling time shall not be greater than 5 seconds. When the step change in Automatic Voltage Regulator reference voltage is reversed, the field voltage should begin to respond without any delay and should not be held down by the Under Excitation Limiter. Operation into or out of the preset limit levels shall ensure that any resultant oscillations are damped so that the disturbance is within 0.5% of the Onshore Generating Unit MVA rating within a period of 5 seconds.

CC.A.6.2.7.3 The Generator shall also make provision to prevent the reduction of the Onshore Generating Unit excitation to a level which would endanger synchronous stability when the Excitation System is under manual control.

CC.A.6.2.8 Over-Excitation Limiters

CC.A.6.2.8.1 The settings of the Over-Excitation Limiter, where it exists, shall ensure that the generator excitation is not limited to less than the maximum value that can be achieved whilst ensuring the Onshore Generating Unit is operating within its design limits. If the generator excitation is reduced following a period of operation at a high level, the rate of reduction shall not exceed that required to remain within any time dependent operating characteristics of the Onshore Generating Unit.

CC.A.6.2.8.2 The performance of the Over-Excitation Limiter, where it exists, shall be demonstrated by testing its response to a step increase in the Automatic Voltage Regulator reference voltage that results in operation of the Over Excitation Limiter. Prior to application of the step the Onshore Generating Unit shall be generating
Rated Active Power and operating within its continuous Reactive Power capability. The size of the step will be determined by the minimum value necessary to operate the Over-Excitation Limiter and will be agreed by NGET and the Generator. The resulting operation beyond the Over-Excitation Limit shall be controlled by the Over-Excitation Limiter without the operation of any protection that could trip the Onshore Generating Unit. The step shall be removed immediately on completion of the test.

CC.A.6.2.8.3 The Generator shall also make provision to prevent any over-excitation restriction of the generator when the Excitation System is under manual control, other than that necessary to ensure the Onshore Generating Unit is operating within its design limits.
APPENDIX 7

PERFORMANCE REQUIREMENTS FOR CONTINUOUSLY ACTING AUTOMATIC VOLTAGE CONTROL SYSTEMS FOR ONSHORE NON-SYNCHRONOUS GENERATING UNITS, ONSHORE DC CONVERTERS AND ONSHORE POWER PARK MODULES

CC.A.7.1 SCOPE

CC.A.7.1.1 This Appendix sets out the performance requirements of continuously acting automatic voltage control systems for Onshore Non-Synchronous Generating Units, Onshore DC Converters and Onshore Power Park Modules that must be complied with by the User. This Appendix does not limit any site specific requirements that may be included in a Bilateral Agreement where in NGET’s reasonable opinion these facilities are necessary for system reasons.

CC.A.7.1.2 Proposals by Generators to make a change to the voltage control systems are required to be notified to NGET under the Planning Code (PC.A.1.2(b) and (c)) as soon as the Generator anticipates making the change. The change may require a revision to the Bilateral Agreement.

CC.A.7.2 Requirements

CC.A.7.2.1 NGET requires that the continuously acting automatic voltage control system for the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module shall meet the following functional performance specification. If a Network Operator has confirmed to NGET that its network to which an Embedded Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module is connected is restricted such that the full reactive range under the steady state voltage control requirements (CC.A.7.2.2) cannot be utilised, NGET may specify in the Bilateral Agreement alternative limits to the steady state voltage control range that reflect these restrictions. Where the Network Operator subsequently notifies NGET that such restriction has been removed, NGET may propose a Modification to the Bilateral Agreement (in accordance with the CUSC contract) to remove the alternative limits such that the continuously acting automatic voltage control system meets the following functional performance specification. All other requirements of the voltage control system will remain as in this Appendix.

CC.A.7.2.2 Steady State Voltage Control

CC.A.7.2.2.1 The Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module shall provide continuous steady state control of the voltage at the Onshore Grid Entry Point (or Onshore User System Entry Point if Embedded) with a Setpoint Voltage and Slope characteristic as illustrated in Figure CC.A.7.2.2a. It should be noted that where the Reactive Power capability requirement of a directly connected Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module in Scotland, as specified in CC.6.3.2 (c), is not at the Onshore Grid Entry Point, the values of Qmin and Qmax shown in this figure will be as modified by the 33/132kV or 33/275kV or 33/400kV transformer.
Grid Entry Point voltage
(or User System Entry Point voltage if Embedded)

Setpoint Voltage
95%<Vset<105%

Slope:
this is the percentage change in voltage, based on nominal, that results in a change of reactive power from 0 to Q min or 0 to Q max

Reactive capability corresponding to 0.95 leading Power Factor at Rated MW
Reactive capability corresponding to 0.95 lagging Power Factor at Rated MW

Figure CC.A.7.2.2a

CC.A.7.2.2.2 The continuously acting automatic control system shall be capable of operating to a Setpoint Voltage between 95% and 105% with a resolution of 0.25% of the nominal voltage. For the avoidance of doubt values of 95%, 95.25%, 95.5% ... may be specified, but not intermediate values. The initial Setpoint Voltage will be 100%. The tolerance within which this Setpoint Voltage shall be achieved is specified in BC2.A.2.6. For the avoidance of doubt, with a tolerance of 0.25% and a Setpoint Voltage of 100%, the achieved value shall be between 99.75% and 100.25%. NGET may request the Generator to implement an alternative Setpoint Voltage within the range of 95% to 105%. For Embedded Generators the Setpoint Voltage will be discussed between NGET and the relevant Network Operator and will be specified to ensure consistency with CC.6.3.4.

CC.A.7.2.2.3 The Slope characteristic of the continuously acting automatic control system shall be adjustable over the range 2% to 7% (with a resolution of 0.5%). For the avoidance of doubt values of 2%, 2.5%, 3% ... may be specified, but not intermediate values. The initial Slope setting will be 4%. The tolerance within which this Slope shall be achieved is specified in BC2.A.2.6. For the avoidance of doubt, with a tolerance of 0.5% and a Slope setting of 4%, the achieved value shall be between 3.5% and 4.5%. NGET may request the Generator to implement an alternative slope setting within the range of 2% to 7%. For Embedded Generators the Slope setting will be discussed between NGET and the relevant Network Operator and will be specified to ensure consistency with CC.6.3.4.
Reactive capability corresponding to 0.95 leading Power Factor at Rated MW

Reactive capability corresponding to 0.95 lagging Power Factor at Rated MW

Figure CC.A.7.2.2b

Onshore Grid Entry Point Voltage (or Onshore User System Entry Point voltage if Embedded)
Connections at 33kV and below

Figure CC.A.7.2.2c
CC.A.7.2.2.4  Figure CC.A.7.2.2b shows the required envelope of operation for Onshore Non-Synchronous Generating Units, Onshore DC Converters and Onshore Power Park Modules except for those Embedded at 33kV and below or directly connected to the National Electricity Transmission System at 33kV and below. Figure CC.A.7.2.2c shows the required envelope of operation for Onshore Non-Synchronous Generating Units, Onshore DC Converters and Onshore Power Park Modules Embedded at 33kV and below or directly connected to the National Electricity Transmission System at 33kV and below. Where the Reactive Power capability requirement of a directly connected Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module in Scotland, as specified in CC6.3.2 (c), is not at the Onshore Grid Entry Point, the values of Qmin and Qmax shown in this figure will be as modified by the 33/132kV or 33/275kV or 33/400kV transformer. The enclosed area within points ABCDEFGH is the required capability range within which the Slope and Setpoint Voltage can be changed.

CC.A.7.2.2.5 Should the operating point of the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module deviate so that it is no longer a point on the operating characteristic (figure CC.A.7.2.2a) defined by the target Setpoint Voltage and Slope, the continuously acting automatic voltage control system shall act progressively to return the value to a point on the required characteristic within 5 seconds.

CC.A.7.2.2.6 Should the Reactive Power output of the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module reach its maximum lagging limit at an Onshore Grid Entry Point voltage (or Onshore User System Entry Point voltage if Embedded) above 95%, the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module shall maintain maximum lagging Reactive Power output for voltage reductions down to 95%. This requirement is indicated by the line EF in figures CC.A.7.2.2b and CC.A.7.2.2c. Should the Reactive Power output of the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module reach its maximum leading limit at an Onshore Grid Entry Point voltage (or Onshore User System Entry Point voltage if Embedded) below 105%, the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module shall maintain maximum leading Reactive Power output for voltage increases up to 105%. This requirement is indicated by the line AB in figures CC.A.7.2.2b and CC.A.7.2.2c.

CC.A.7.2.2.7 For Onshore Grid Entry Point voltages (or Onshore User System Entry Point voltages if Embedded) below 95%, the lagging Reactive Power capability of the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module should be that which results from the supply of maximum lagging reactive current whilst ensuring the current remains within design operating limits. An example of the capability is shown by the line DE in figures CC.A.7.2.2b and CC.A.7.2.2c. For Onshore Grid Entry Point voltages (or User System Entry Point voltages if Embedded) above 105%, the leading Reactive Power capability of the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module should be that which results from the supply of maximum leading reactive current whilst ensuring the current remains within design operating limits. An example of the capability is shown by the line AH in figures CC.A.7.2.2b and CC.A.7.2.2c. Should the Reactive Power output of the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module reach its maximum lagging limit at an Onshore Grid Entry Point voltage (or Onshore User System Entry Point voltage if Embedded) below 95%,
the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park
Module shall maintain maximum lagging reactive current output for further voltage decreases. Should the Reactive Power output of the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module reach its maximum leading limit at a Onshore Grid Entry Point voltage (or User System Entry Point voltage if Embedded) above 105%, the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module shall maintain maximum leading reactive current output for further voltage increases.

CC.A.7.2.3 Transient Voltage Control

CC.A.7.2.3.1 For an on-load step change in Onshore Grid Entry Point or Onshore User System Entry Point voltage, the continuously acting automatic control system shall respond according to the following minimum criteria

i. the Reactive Power output response of the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module shall commence within 0.2 seconds of the application of the step. It shall progress linearly although variations from a linear characteristic shall be acceptable provided that the MVAr seconds delivered at any time up to 1 second are at least those that would result from the response shown in figure CC.A.7.2.3.1a.

ii. the response shall be such that, for a sufficiently large step, 90% of the full reactive capability of the Onshore Non-Synchronous Generating Unit, Onshore DC Converter or Onshore Power Park Module, as required by CC.6.3.2 (or, if appropriate, CC.A.7.2.2.6 or CC.A.7.2.2.7), will be produced within 1 second

iii. the magnitude of the Reactive Power output response produced within 1 second shall vary linearly in proportion to the magnitude of the step change

iv. the settling time shall be no greater than 2 seconds from the application of the step change in voltage and the peak to peak magnitude of any oscillations shall be less than 5% of the change in steady state Reactive Power within this time.

v. following the transient response, the conditions of CC.A.7.2.2 apply.
CC.A.7.2.4  **Power Oscillation Damping**

CC.A.7.2.4.1 The requirement for the continuously acting voltage control system to be fitted with a *Power System Stabiliser (PSS)* shall be specified in the *Bilateral Agreement* if, in *NGET’s* view, this is required for system reasons. However if a *Power System Stabiliser* is included in the voltage control system its settings and performance shall be agreed with *NGET* and commissioned in accordance with *BC.2.11.2*.

CC.A.7.2.5  **Overall Voltage Control System Characteristics**

CC.A.7.2.5.1 The continuously acting automatic voltage control system is required to respond to minor variations, steps, gradual changes or major variations in *Onshore Grid Entry Point* voltage (or *Onshore User System Entry Point* voltage if *Embedded*).

CC.A.7.2.5.2 The overall voltage control system shall include elements that limit the bandwidth of the output signal. The bandwidth limiting must be consistent with the speed of response requirements and ensure that the highest frequency of response cannot excite torsional oscillations on other plant connected to the network. A bandwidth of 0-5Hz would be judged to be acceptable for this application. All other control systems employed within the *Onshore Non-Synchronous Generating Unit, Onshore DC Converter* or *Onshore Power Park Module* should also meet this requirement.

CC.A.7.2.5.3 The response of the voltage control system (including the *Power System Stabiliser* if employed) shall be demonstrated by applying suitable step disturbances into the voltage control system of the *Onshore Power Park Module* or *Power Park Unit*, or by changing the actual voltage at a suitable point, with the generator operating at points specified by *NGET* (up to rated MVA output). The damping shall be judged to be adequate if the corresponding *Active Power* response to the disturbances decays within 2 seconds of the application of the step.

< End of CC >
## OPERATING CODE NO. 1

DEMAND FORECASTS

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OPERATING CODE NO. 1

DEMAND FORECASTS

OC1.1 INTRODUCTION

OC1.1.1 Operating Code No.1 ("OC1") is concerned with Demand forecasting for operational purposes. In order to match generation output with Demand for electricity it is necessary to undertake Demand forecasting. It is also necessary to undertake Demand forecasting of Reactive Power.

OC1.1.2 In the Operational Planning Phase, Demand forecasting shall be conducted by NGET taking account of Demand forecasts furnished by Network Operators, who shall provide NGET with information in the form set out in this OC1. The data supplied under the PC is also taken into account.

OC1.1.3 In the Programming Phase and Control Phase, NGET will conduct its own Demand forecasting taking into account information to be furnished by Suppliers and Network Operators and the other factors referred to in OC1.6.1.

OC1.1.4 In this OC1, the point of connection of the External Interconnection to the National Electricity Transmission System shall be considered as a Grid Supply Point. Reactive Power Demand includes the series Reactive losses of the User's System but excludes any network susceptance and any Reactive compensation on the User's System. NGET will obtain the lumped network susceptance and details of Reactive compensation from the requirements to submit data under the PC.

OC1.1.5 Data relating to Demand Control should include details relating to MW.

OC1.1.6 OC1 deals with the provision of data on Demand Control in the Operational Planning Phase, the Programming Phase and the Post-Control Phase, whereas OC6 (amongst other things) deals with the provision of data on Demand Control following the Programming Phase and in the Control Phase.

OC1.1.7 In this OC1, Year 0 means the current Financial Year at any time, Year 1 means the next Financial Year at any time, Year 2 means the Financial Year after Year 1, etc.

OC1.1.8 References in OC1 to data being supplied on a half hourly basis refer to it being supplied for each period of 30 minutes ending on the hour and half-hour in each hour.
OC1.2 OBJECTIVE

The objectives of OC1 are to:

OC1.2.1 enable the provision of data to NGET by Users in the Programming Phase, Control Phase and Post-Control Phase; and

OC1.2.2 provide for the factors to be taken into account by NGET when Demand forecasting in the Programming Phase and Control Phase.

OC1.3 SCOPE

OC1 applies to NGET and to Users which in this OC1 means:-

(a) Network Operators, and

(b) Suppliers.

OC1.4 DATA REQUIRED BY NGET IN THE OPERATIONAL PLANNING PHASE

OC1.4.1 (a) Each User, as specified in (b) below, shall provide NGET with the data requested in OC1.4.2 below.

(b) The data will need to be supplied by each Network Operator directly connected to the National Electricity Transmission System in relation to Demand Control and in relation each Generator with respect to the output of Embedded Medium Power Stations within its System.

OC1.4.2 (a) Data

By calendar week 28 each year each Network Operator will provide to NGET in writing the forecast information listed in (c) below for the current Financial Year and each of the succeeding five Financial Years.

(b) Data Providers

In circumstances when the busbar arrangement at a Grid Supply Point is expected to be operated in separate sections, separate sets of forecast information for each section will be provided to NGET.

(c) Embedded Medium Power Station Output and Demand Control:

For the specified time of the annual peak half hour National Electricity Transmission System Demand, as specified by NGET under PC.A.5.2.2, the output of Embedded Medium Power Stations and forecasts of Demand to be relieved by Demand Control on a Grid Supply Point basis giving details of the amount and duration of the Demand Control.
OC1.5 DATA REQUIRED BY NGET IN THE PROGRAMMING PHASE, CONTROL PHASE and POST-CONTROL PHASE

OC1.5.1 Programming Phase

For the period of 2 to 8 weeks ahead the following will be supplied to NGET in writing by 1000 hours each Monday:

(a) **Demand Control:**
   Each **Network Operator** will supply MW profiles of the amount and duration of their proposed use of Demand Control which may result in a Demand change equal to or greater than the **Demand Control Notification Level** (averaged over any half hour on any **Grid Supply Point**) on a half hourly and **Grid Supply Point** basis;

(b) **Medium Power Station Operation:**
   Each **Network Operator** will, if reasonably required by NGET, supply MW schedules for the operation of **Embedded Medium Power Stations** within its **System** on a half hourly and **Grid Supply Point** basis.

OC1.5.2 For the period 2 to 12 days ahead the following will be supplied to NGET in writing by 1200 hours each Wednesday:

(a) **Demand Control:**
   Each **Network Operator** will supply MW profiles of the amount and duration of their proposed use of Demand Control which may result in a Demand change equal to or greater than the **Demand Control Notification Level** (averaged over any half hour on any **Grid Supply Point**) on a half hourly and **Grid Supply Point** basis;

(b) **Medium Power Station Operation:**
   Each **Network Operator** will, if reasonably required by NGET, supply MW schedules for the operation of **Embedded Medium Power Stations** within its **System** on a half hourly and **Grid Supply Point** basis.

OC1.5.3 Medium Power Station Output:
Each **Network Operator** will, if reasonably required by NGET, supply NGET with MW schedules for the operation of **Embedded Medium Power Stations** within its **System** on a half hourly and **Grid Supply Point** basis in writing by 1000 hours each day (or such other time specified by NGET from time to time) for the next day (except that it will be for the next 3 days on Fridays and 2 days on Saturdays and may be longer (as specified by NGET at least one week in advance) to cover holiday periods);

OC1.5.4 Other Codes
Under **OC6** each **Network Operator** will notify NGET of their proposed use of Demand Control (which may result in a Demand change equal to or greater than the **Demand Control Notification Level**), and under **BC1**, each **Supplier** will notify NGET of their proposed use of Customer Demand Management (which may result in a Demand change equal to or greater than the **Customer Demand Management Notification Level**) in this timescale.
OC1.5.5 **Control Phase**

OC1.5.5.1 **Demand Control:**
Under OC6, each Network Operator will notify NGET of any Demand Control proposed by itself which may result in a Demand change equal to or greater than the Demand Control Notification Level averaged over any half hour on any Grid Supply Point which is planned after 1000 hours, and of any changes to the planned Demand Control notified to NGET prior to 1000 hours as soon as possible after the formulation of the new plans.

OC1.5.5.2 **Customer Demand Management:**

(a) Each Supplier will notify NGET of any Customer Demand Management proposed by itself which may result in a Demand change equal to or greater than the Customer Demand Management Notification Level averaged over any half hour on any Grid Supply Point which is planned to occur at any time in the Control Phase and of any changes to the planned Customer Demand Management already notified to NGET as soon as possible after the formulation of the new plans.

(b) The following information is required on a Grid Supply Point and half-hourly basis:-

(i) the proposed date, time and duration of implementation of Customer Demand Management; and

(ii) the proposed reduction in Demand by use of Customer Demand Management.

OC1.5.5.3 **Load Management Blocks:**

In Scotland, by 11:00 each day, each Supplier who controls a Load Management Block of Demand with a capacity of 5MW or more shall submit to NGET a schedule of its proposed switching times and profiles in respect of each block for the next day.

OC1.5.6 **Post-Control Phase**

The following will be supplied to NGET in writing by 0600 hours each day in respect of Active Power data and by 1000 hours each day in respect of Reactive Power data:

(a) **Demand Control:**
Each Network Operator will supply MW profiles for the previous calendar day of the amount and duration of Demand reduction achieved by itself from the use of Demand Control equal to or greater than the Demand Control Notification Level (averaged over any half hour on any Grid Supply Point), on a half hourly and Grid Supply Point basis.

(b) **Customer Demand Management:**
Each Supplier will supply MW profiles of the amount and duration of Demand reduction achieved by itself from the use of Customer
Demand Management equal to or greater than the Customer Demand Management Notification Level (averaged over any half hour on any Grid Supply Point) on a half hourly and Grid Supply Point basis during the previous calendar day.

OC1.6  **NGET FORECASTS**

OC1.6.1 The following factors will be taken into account by NGET when conducting National Electricity Transmission System Demand forecasting in the Programming Phase and Control Phase:

(a) Historic Demand data (this includes National Electricity Transmission System Losses).

(b) Weather forecasts and the current and historic weather conditions.

(c) The incidence of major events or activities which are known to NGET in advance.

(d) Anticipated interconnection flows across External Interconnections.

(e) Demand Control equal to or greater than the Demand Control Notification Level (averaged over any half hour at any Grid Supply Point) proposed to be exercised by Network Operators and of which NGET has been informed.

(f) Customer Demand Management equal to or greater than the Customer Demand Management Notification Level (averaged over any half hour at any Grid Supply point) proposed to be exercised by Suppliers and of which NGET has been informed.

(g) Other information supplied by Users.

(h) Anticipated Pumped Storage Unit demand.

(i) the sensitivity of Demand to anticipated market prices for electricity.

(j) BM Unit Data submitted by BM Participants to NGET in accordance with the provisions of BC1 and BC2.

(k) Demand taken by Station Transformers

OC1.6.2 Taking into account the factors specified in OC1.6.1 NGET uses Demand forecast methodology to produce forecasts of National Electricity Transmission System Demand. A written record of the use of the methodology must be kept by NGET for a period of at least 12 months.

OC1.6.3 The methodology will be based upon factors (a), (b) and (c) above to produce, by statistical means, unbiased forecasts of National Demand. National Electricity Transmission System Demand will be calculated from these forecasts but will also take into account factors (d), (e), (f), (g), (h), (i) and (j) above. No other factors are taken into account by NGET, and it will base its National Electricity Transmission System Demand forecasts on those factors only.
< End of OC1 >
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OPERATING CODE NO.2

OPERATIONAL PLANNING AND DATA PROVISION

OC2.1 INTRODUCTION

OC2.1.1 Operating Code No. 2 ("OC2") is concerned with:

(a) the co-ordination of the release of Synchronous Generating Units and Power Park Modules, the National Electricity Transmission System and Network Operators’ Systems for construction, repair and maintenance;

(b) provision by NGET of the Surpluses both for the National Electricity Transmission System and System Zones;

(c) the provision by Generators of Generation Planning Parameters for Gensets, including CCGT Module Planning Matrices and Power Park Module Planning Matrices, to NGET for planning purposes only; and

(d) the agreement for release of Existing Gas Cooled Reactor Plant for outages in certain circumstances.

OC2.1.2 (a) Operational Planning involves 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, Power Park Modules and DC Converters, and of parts of the National Electricity Transmission System and of parts of Network Operators’ Systems which is carried out to achieve, so far as possible, the standards of security set out in NGET’s Transmission Licence, each Relevant Transmission Licensee’s Transmission Licence or Electricity Distribution Licence as the case may be.

(b) In general terms there is an "envelope of opportunity" for the release of Synchronous Generating Units and Power Park Modules and for the release of parts of the National Electricity Transmission System and parts of the Network Operator’s User Systems for outages. The envelope is defined by the difference between the total generation output expected from Large Power Stations, Medium Power Stations and Demand, the operational planning margin and taking into account External Interconnections.

OC2.1.3 In this OC2 for the purpose of Generator outage co-ordination Year 0 means the current calendar year at any time, Year 1 means the next calendar year at any time, Year 2 means the calendar year after Year 1, etc. For the purpose of Transmission outage planning Year 0 means the current Financial Year at any time, Year 1 means the next Financial Year at any time, Year 2 means the Financial Year after Year 1, etc. References to ‘weeks’ in OC2 are to calendar weeks as defined in ISO 8601.

OC2.1.4 References in OC2 to a Generator’s “best estimate” shall be that Generator’s best estimate acting as a reasonable and prudent Generator in all the circumstances.

OC2.1.5 References to NGET planning the National Electricity Transmission System outage programme on the basis of the Final Generation Outage Programme,
are to NGET planning against the Final Generation Outage Programme current at the time it so plans.

OC2.1.6 Where in OC2 data is required to be submitted or information is to be given on a particular day, that data does not need to be submitted and that information does not need to be given on that day if it is not a Business Day or it falls within a holiday period (the occurrence and length of which shall be determined by NGET, in its reasonable discretion, and notified to Users). Instead, that data shall be submitted and/or that information shall be given on such other Business Day as NGET shall, in its reasonable discretion, determine. However, NGET may determine that that data and/or information need not be submitted or given at all, in which case it shall notify each User as appropriate.

OC2.1.7 In Scotland, it may be possible with the agreement of NGET to reduce the administrative burden for Users in producing planning information where either the output or demand is small.

OC2.2 OBJECTIVE

OC2.2.1 (a) The objective of OC2 is to seek to enable NGET to harmonise outages of Synchronous Generating Units and Power Park Modules in order that such outages are co-ordinated (taking account of Embedded Medium Power Stations) between Generators and Network Operators, and that such outages are co-ordinated taking into account National Electricity Transmission System outages and other System outages, so far as possible to minimise the number and effect of constraints on the National Electricity Transmission System or any other System.

(b) In the case of Network Operator' User Systems directly connected to the National Electricity Transmission System this means in particular that there will also need to be harmonisation of outages of Embedded Synchronous Generating Units and Embedded Power Park Modules, and National Electricity Transmission System outages, with Network Operators in respect of their outages on those Systems.

OC2.2.2 The objective of OC2 is also to enable the provision by NGET of the Surpluses both for the National Electricity Transmission System and System Zones.

OC2.2.3 A further objective of OC2 is to provide for the agreement for outages for Existing Gas Cooled Reactor Plant in certain circumstances and to enable a process to be followed in order to provide for that.

OC2.2.4 The boundaries of the System Zones will be determined by NGET from time to time taking into account the disposition of Generators' Power Stations within the System Zones. The location of the boundaries will be made available to all Users. Any User may request that NGET reviews any of the System Zonal boundaries if that User considers that the current boundaries are not appropriate, giving the reasons for their concerns. On receipt of such a request NGET will review the boundaries if, in NGET's reasonable opinion, such a review is justified.

OC2.3 SCOPE

OC2.3.1 OC2 applies to NGET and to Users which in OC2 means:-
(a) **Generators**, only in respect of their **Large Power Stations** or their **Power Stations** which are directly connected to **National Electricity Transmission System** (and the term **Generator** in this **OC2** shall be construed accordingly);

(b) **Network Operators**; and

(c) **Non-Embedded Customers**; and

(d) **DC Converter Station** owners.

**OC.2.3.2**  
**NGET** may provide to the **Relevant Transmission Licensees** any data which has been submitted to **NGET** by any **Users** in respect of **Relevant Units** pursuant to the following paragraphs of the **OC2**.

OC2.4.1.2.1 (a)  
OC2.4.1.2.1 (e)  
OC2.4.1.2.1 (j)  
OC2.4.1.2.2 (a)  
OC2.4.1.2.2 (i)  
OC2.4.1.3.2 (a)  
OC2.4.1.3.2 (b)  
OC2.4.1.3.3  
OC2.4.2.1 (a)

**OC2.4**  
**PROCEDURE**

OC2.4.1  
**Co-ordination of Outages**

OC2.4.1.1  
Under **OC2** the interaction between **NGET** and **Users** will be as follows:

(a) **Each Generator** and **NGET** In respect of outages of **Synchronous generating Units** and **Power Park Modules** and in respect of outages of other **Plant** and/or **Apparatus** directly connected to the **National Electricity Transmission System**;

(b) **NGET** and each **Generator** in respect of **National Electricity Transmission System** outages relevant to each **Generator** (other than in respect of **Embedded Small Power Stations** or **Embedded Medium Power Stations**);

(c) **NGET** and each **Network Operator** in respect of outages of all **Embedded Large Power Stations** and in respect of outages of other **Plant** and/or **Apparatus** relating to such **Embedded Large Power Stations**;
(d) NGET and each Network Operator and each Non-Embedded Customer in respect of National Electricity Transmission System outages relevant to the particular Network Operator or Non-Embedded Customers;

(e) Each Network Operator and each Non-Embedded Customer and NGET in respect of User System outages relevant to NGET; and

in respect of Network Operators only, outages of the Network Operator's User System that may impact upon an Offshore Transmission System connected to that Network Operator's User System.

OC2.4.1.2 PLANNING OF SYNCHRONOUS GENERATING UNIT AND POWER PARK MODULE OUTAGES

OC2.4.1.2.1 Operational Planning Phase - Planning for Calendar Years 3 to 5 inclusive – Weekly Resolution

In each calendar year:

(a) By the end of week 2

Each Generator will provide NGET in writing with:

(i) a provisional Synchronous Generating Unit and Power Park Module outage programme (covering all non-Embedded Power Stations and Embedded Large Power Stations) for Year 3 to Year 5 (inclusive) specifying the Synchronous Generating Unit and/or Power Park Module and MW concerned, duration of proposed outages, the preferred date for each outage and where there is a possibility of flexibility, the earliest start date and latest finishing date; and

(ii) a best estimate weekly Output Usable forecast of all its Gensets for Year 3 to Year 5.

(b) Between the end of week 2 and the end of week 12

NGET will be:

(i) calculating total winter peak generating capacity assumed to be available to the Total System (taking into account the import capacity which may be available from External Interconnections);

(ii) calculating the total winter peak generating capacity expected from Large Power Stations, taking into account Demand forecasts and details of proposed use of Demand Control received under OC1, and an operational planning margin set by NGET (the "Operational Planning Margin");
(iii) calculating the weekly peak generating capacity expected from Large Power Stations taking into account demand forecasts and details of proposed use of Demand Control received under OC1, and the Operational Planning Margin and Zonal System Security Requirements. The total weekly peak MW needed to be available is the "weekly total MW required".

The calculation under (iii) will effectively define the envelope of opportunity for outages of Synchronous Generating Units and Power Park Modules.

During this period, NGET may, as appropriate, contact each Generator who has supplied information to seek clarification on points.

(c) By the end of week 12

NGET will:

(i) having taken into account the information notified to it by Generators and taking into account:-

(1) National Electricity Transmission System constraints and outages,

(2) Network Operator System constraints and outages, known to NGET, and

(3) the Output Usable required, in its view, to meet weekly total MW requirements,

provide each Generator in writing with any suggested amendments to the provisional outage programme supplied by the Generator which NGET believes necessary, and will advise Generators with Large Power Stations of the Surpluses both for the National Electricity Transmission System and System Zones and potential export limitations, on a weekly basis, which would occur without such amendments;

(ii) provide each Network Operator in writing with potential outages of Synchronous Generating Units and/or Power park Modules which may, in the reasonable opinion of NGET and the Network Operator, affect the integrity of that Network Operator's User System provided that, in such circumstances NGET has notified the Generator concerned at least 48 hours beforehand of its intention to do so (including identifying the Synchronous Generating Unit and/or Power Park Module concerned).

(d) By the end of week 14

(i) Where a Generator or a Network Operator is unhappy with the suggested amendments to its provisional outage programme (in the case of a Generator) or such potential outages (in the case of a Network Operator) it may contact NGET to explain its concerns and NGET and that Generator or Network Operator will then discuss the problem and seek to resolve it.
(ii) The possible resolution of the problem may require NGET or a User to contact other Generators and Network Operators, and joint meetings of all parties may, if any User feels it would be helpful, be convened by NGET. The need for further discussions, be they on the telephone or at meetings, can only be determined at the time.

(e) By the end of week 25

Each Generator will provide NGET in writing with an updated provisional Synchronous Generating Unit and Power Park Module outage programme covering both Embedded and non-Embedded Large Power Stations together with the best estimate weekly Output Usable forecasts for each Genset, in all cases for Year 3 to Year 5 (inclusive). The updated provisional Synchronous Generating Unit and Power Park Module outage programme will contain the MW concerned, duration of proposed outages, the preferred date for each outage and, where applicable, earliest start date and latest finishing date, together with an update of the Output Usable estimate supplied under (a)(ii) above.

(f) Between the end of week 25 and the end of week 28

NGET will be considering the updated provisional Synchronous Generating Unit and Power Park Module outage programme, together with the best estimate weekly Output Usable forecasts supplied to it by Generators under (e) and their Registered Capacity and will be analysing Operational Planning Margins for the period.

(g) By the end of week 28

NGET will:

(i) provide each Generator in writing with details of any suggested revisions considered by NGET as being necessary to the updated provisional Synchronous Generating Unit and Power Park Module outage programme supplied to NGET under (e) and will advise Generators with Large Power Stations of the Surpluses for the National Electricity Transmission System and System Zones and potential export limitations on a weekly basis which would occur without such revisions; and

(ii) provide each Network Operator in writing with the update of potential outages of Synchronous Generating Units and/or Power Park Modules which, in the reasonable opinion of NGET and the Network Operator, affect the integrity of that Network Operator’s User System.

(h) By the end of week 31

Where a Generator or a Network Operator is unhappy with the revisions suggested to the updated provisional Synchronous Generating Unit and Power Park Module outage programme (in the case of a Generator) or such update of potential outages (in the case of a Network Operator) under (g) it may contact NGET to explain its concerns and the provisions set out in (d) above will apply to that process.
(i) **By the end of week 42**

**NGET** will:

1. provide each **Generator** in writing with details of suggested revisions considered by **NGET** as being necessary to the updated provisional **Synchronous Generating Unit** and **Power Park Module** outage programme supplied to **NGET** and will advise **Generators** with **Large Power Stations** of the **Surpluses** for the **National Electricity Transmission System** and **System Zones** and potential export limitations, on a weekly basis which would occur without such revisions;

2. provide each **Network Operator** in writing with the update of potential outages of **Synchronous Generating Units** and/or **Power Park Modules** which may, in the reasonable opinion of **NGET** and the **Network Operator**, affect the integrity of that **Network Operator's User System** provided that, in such circumstances **NGET** has notified the **Generator** concerned at least 48 hours beforehand of its intention to do so (including identifying the **Synchronous Generating Units** and/or **Power Park Modules** concerned).

(j) **By the end of week 45**

**NGET** will seek to agree a **Final Generation Outage Programme** for Year 3 to Year 5. If agreement cannot be reached on all aspects, **NGET** and each **Generator** will record their agreement on as many aspects as have been agreed and **NGET** will advise each **Generator** with **Large Power Stations** and each **Network Operator**, of the **Surpluses** for the **National Electricity Transmission System** and **System Zones** on a weekly basis which would occur in relation to those aspects not agreed. It is accepted that agreement of the **Final Generation Outage Programme** is not a commitment on **Generators** or **NGET** to abide by it, but **NGET** will be planning the **National Electricity Transmission System** outage programme on the basis of the **Final Generation Outage Programme** and if in the event the **Generator's** outages differ from those contained in the **Final Generation Outage Programme**, or in any way conflict with the **National Electricity Transmission System** outage programme, **NGET** need not alter the **National Electricity Transmission System** outage programme.

**OC2.4.1.2.2 Operational Planning Phase - Planning for Calendar Year 1 and Calendar Year 2 – Weekly Resolution**

The basis for **Operational Planning** for Year 1 and Year 2 will be the **Final Generation Outage Programmes** agreed for Years 2 and 3:

In each calendar year:

(a) **By the end of week 10**

Each **Generator** will provide **NGET** in writing with its previously agreed **Final Generation Outage Programme** updated and best estimate weekly **Output Usable** forecasts for each **Genset** for weeks 1-52 of Years 1 and 2.
(b) **Between the end of week 10 and the end of week 12**

NGET will be considering the updated proposed *Synchronous Generating Unit* and *Power Park Module* outage programme together with the estimate of *Output Usable* supplied by *Generators* under (a) and will be analysing *Operational Planning Margins* for the period. Taking these into account together with *National Electricity Transmission System* constraints and outages and *Network Operator User System* constraints and outages known to NGET, NGET will assess whether the estimates of *Output Usable* supplied by *Generators* are sufficient to meet forecast *National Electricity Transmission System Demand* plus the *Operational Planning Margin*.

(c) **By the end of week 12**

NGET will:

(i) notify each *Generator* in writing whether the *Output Usable* estimates are adequate for weeks 1-52 of Years 1 and 2, together with suggested changes to its *Final Generation Outage Programme* where necessary and will advise each *Generator* with *Large Power Stations* of the *Surpluses* both for the *National Electricity Transmission System* and *System Zones* and potential export limitations, on a weekly resolution which would occur without such changes;

(ii) provide each *Network Operator* in writing with weekly *Output Usable* estimates of *Generators* for weeks 1-52 of Years 1 and 2, and updated details of potential outages of *Synchronous Generating Units* and/or *Power Park Modules* which may, in the reasonable opinion of NGET and the *Network Operator*, affect the integrity of that *Network Operator’s User System* provided that, in such circumstances, NGET has notified the *Generator* concerned at least 48 hours beforehand of its intention to do so (including identifying the affected *Gensets* or *Synchronous Generating Units* and/or *Power Park Modules*, as appropriate).

(d) **By the end of week 14**

Where a *Generator* or a *Network Operator* is unhappy with any suggested changes to its *Final Generation Outage Programme* (in the case of a *Generator*) or such update of potential outages (in the case of a *Network Operator*), equivalent provisions to those set out in OC2.4.1.2.1(d) will apply.

(e) **By the end of week 34**

Each *Generator* will provide NGET in writing with revised best estimate weekly *Output Usable* forecasts for each *Genset* for weeks 1-52 of Years 1 and 2.

(f) **Between the end of week 34 and the end of week 39**

NGET will be analysing the revised estimates of *Output Usable* supplied by *Generators* under (e) and will be analysing *Operational Planning Margins* for the period. Taking these into account together with *National
Electricity Transmission System constraints and outages and Network Operator User System constraints and outages known to NGET, NGET will assess whether the estimates of Output Usable supplied by Generators are sufficient to meet forecast National Electricity Transmission System Demand plus the Operational Planning Margin.

(g) By the end of week 39

NGET will:

(i) notify each Generator in writing whether it accepts the Output Usable estimates for weeks 1-52 of Years 1 and 2, and of any suggested changes to its Final Generation Outage Programme where necessary and will advise Generators with Large Power Stations of the Surpluses both for the National Electricity Transmission System and System Zones and potential export limitations on a weekly basis which would occur without such changes;

(ii) provide each Network Operator in writing with Output Usable estimates of Generators for weeks 1-52 of Years 1 and 2, and updated details of potential outages of Synchronous Generating Units and/or Power Park Modules which may, in the reasonable opinion of NGET and the Network Operator, affect the integrity of that Network Operator's User System provided that, in such circumstances, NGET has notified the Generator concerned at least 48 hours beforehand of its intention to do so (including identifying the affected Gensets or Synchronous Generating Units and/or Power Park Modules, as appropriate).

(h) By the end of week 46

Where a Generator or a Network Operator, is unhappy with any suggested changes to its Final Generation Outage Programme (in the case of a Generator) or such update of potential outages (in the case of a Network Operator), equivalent provisions to those set out in OC2.4.1.2.1(d) will apply.

(i) By the end of week 48

NGET will seek to agree the revised Final Generation Outage Programme for Year 1 and Year 2. If agreement cannot be reached on all aspects, NGET and each Generator will record their agreement on as many aspects as have been agreed and NGET will advise each Generator with Large Power Stations and each Network Operator, of Generating Plant Demand Margins for national and zonal groups, on a weekly basis, which would occur in relation to those aspects not agreed. It is accepted that agreement of the Final Generation Outage Programme is not a commitment on Generators or NGET to abide by it, but NGET will be planning the National Electricity Transmission System outage programme on the basis of the Final Generation Outage Programme and if, in the event, a Generator's outages differ from those contained in the Final Generation Outage Programme, or in any way conflict with the National Electricity Transmission System outage programme, NGET need not alter the National Electricity Transmission System outage programme.

OC2.4.1.2.3 Planning for Calendar Year 0 – Weekly Resolution
The basis for Operational Planning for Year 0 will be the revised Final Generation Outage Programme agreed for Year 1:

In each week:

(a) **By 1600 hours each Wednesday – Weekly Resolution**

Each Generator will provide NGT in writing with an update of the Final Generation Outage Programme and a best estimate weekly Output Usable forecast for each of its Gensets from the 2nd week ahead to the 52nd week ahead.

(b) **Between 1600 hours Wednesday and 1600 hours Friday**

NGET will be analysing the revised estimates of Output Usable supplied by Generators under (a) and will be analysing Operational Planning Margins for the period. Taking into account National Electricity Transmission System constraints and outages and Network Operator User System constraints and outages known to NGET, NGET will assess whether the estimates of Output Usable supplied by Generators are sufficient to meet forecast National Electricity Transmission System Demand plus the Operational Planning Margin.

(c) **By 1600 hours each Friday**

NGET will:

(i) notify each Generator with Large Power Stations and Network Operator, in writing if it considers the Output Usable forecasts will give Surpluses and potential export limitations both for the National Electricity Transmission System and System Zones from the 2nd week ahead to the 52nd week ahead;

(ii) provide each Network Operator, in writing with weekly Output Usable estimates of Gensets from the 2nd week ahead to the 52nd week ahead and updated outages of Synchronous Generating Units and/or Power Park Modules which may, in the reasonable opinion of NGET and the Network Operator, affect the integrity of that Network Operator's User System and in such circumstances, NGET shall notify the Generator concerned within 48 hours of so providing (including identifying the affected Gensets or Synchronous Generating Units and/or Power Park Modules, as appropriate), from the 2nd week ahead to the 52nd week ahead.

**OC2.4.1.2.4 Programming Phase – 2-49 Days Ahead – Daily Resolution**

(a) **By 1200 hours each Friday**

NGET will notify in writing each Generator with Large Power Stations and Network Operator if it considers the Output Usable forecasts will give MW shortfalls both nationally and for constrained groups for the period 2-7 weeks ahead.

(b) **By 1100 hours each Business Day**
Each **Generator** shall provide **NGET** in writing with the best estimate of daily **Output Usable** for each **Genset** for the period from and including day 2 ahead to day 14 ahead, including the forecast return to service date for any such **Generating Unit** or **Power Park Module** subject to **Planned Outage** or breakdown.

(c) By 1100 hours each Wednesday

For the period 2 to 49 days ahead, every Wednesday by 11:00 hours, each **Generator** shall provide **NGET** in writing best estimate daily **Output Usable** forecasts for each **Genset**, and changes (start and finish dates) to **Planned Outage** or to the return to service times of each **Synchronous Generating Unit** and/or **Power Park Module** which is subject to breakdown.

(d) **Between 1100 hours and 1600 hours each Business Day**

**NGET** will be analysing the revised estimates of **Output Usable** supplied by **Generators** under (b) and will be analysing **Operational Planning Margins** for the period 2-14 days ahead. Taking into account **National Electricity Transmission System** constraints and outages and **Network Operator User System** constraints and outages known to **NGET**, **NGET** will assess whether the estimates of **Output Usable** are sufficient to meet forecast **National Electricity Transmission System Demand** plus the **Operational Planning Margin**.

(e) **By 1600 hours each Business Day**

(i) **NGET** will notify in writing each **Generator** with **Large Power Stations** and each **Network Operator**, of the **Surpluses** both for the **National Electricity Transmission System** and **System Zones** and potential export limitations, for the period from and including day 2 ahead to day 14 ahead which it considers the **Output Usable** forecasts will give. The time of 1600 hours can only be met in respect of any **Generator** or **Network Operator** if all the information from all **Generators** was made available to **NGET** by 1100 hours and if a suitable electronic data transmission facility is in place between **NGET** and the **Generator** or the **Network Operator**, as the case may be, and if it is fully operational. In the event that any of these conditions is not met, or if it is necessary to revert to a manual system for analysing the information supplied and otherwise to be considered, **NGET** reserve the right to extend the timescale for issue of the information required under this sub-paragraph to each, or the relevant, **Generator** and/or **Network Operator** (as the case may be) provided that such information will in any event be issued by 1800 hours.

(ii) **NGET** will provide each **Network Operator**, where it has an effect on that **User**, in writing with **Output Usable** estimates of **Gensets** from and including day 2 ahead to day 14 ahead and updated outages of **Synchronous Generating Units** and/or **Power Park Modules** which are either in its **User System** or which may, in the reasonable opinion of **NGET** and the **Network Operator**, affect the integrity of that **Network Operator’s User System** and in such circumstances, **NGET** shall notify the **Generator** concerned within 48 hours of so providing (including identifying the affected **Gensets** or **Synchronous Generating Units** and/or **Power Park Modules**, as appropriate), for the period from and including day 2 ahead to day 14 ahead.
OC2.4.1.3 Planning of *National Electricity Transmission System* Outages

**OC2.4.1.3.1 Operational Planning Phase - Planning for Financial Years 2 to 5 inclusive ahead**

NGET shall plan *National Electricity Transmission System* outages required in Years 2 to 5 inclusive required as a result of construction or refurbishment works. This contrasts with the planning of *National Electricity Transmission System* outages required in Years 0 and 1 ahead, when NGET also takes into account *National Electricity Transmission System* outages required as a result of maintenance.

*Users* should bear in mind that NGET will be planning the *National Electricity Transmission System* outage programme on the basis of the previous year's *Final Generation Outage Programme* and if in the event a *Generator's* or *Network Operator's* outages differ from those contained in the *Final Generation Outage Programme*, or in the case of *Network Operators*, those known to NGET, or in any way conflict with the *National Electricity Transmission System* outage programme, NGET need not alter the *National Electricity Transmission System* outage programme.

**OC2.4.1.3.2 In each calendar year:**

(a) **By the end of week 8**

Each *Network Operator* will notify NGET in writing of details of proposed outages in Years 2-5 ahead in its *User System* which may affect the performance of the *Total System* (which includes but is not limited to outages of *User System Apparatus* at Grid Supply Points and outages which constrain the output of *Synchronous generating Units* and/or *Power Park Modules Embedded* within that *User System*).

Each *Network Operator* will notify NGET in writing of details of proposed outages in Years 2-5 ahead in its *User System* which may affect the declared values of *Maximum Export Capacity* and/or *Maximum Import Capacity* for each *Interface Point* within its *User System* together with the *Network Operator's* revised best estimate of the *Maximum Export Capacity* and/or *Maximum Import Capacity* during such outages. *Network Operators* will also notify NGET of any automatic and/or manual post fault actions that it intends to utilise or plans to utilise during such outages.

(b) **By the end of week 13**

Each *Generator* will inform NGET in writing of proposed outages in Years 2 - 5 ahead of *Generator owned Apparatus* (eg. busbar selectors) other than *Synchronous Generating Units* and/or *Power Park Modules*, at each *Grid Entry Point*.

NGET will provide to each *Network Operator* and to each *Generator* a copy of the information given to NGET under paragraph (a) above (other than the information given by that *Network Operator*). In relation to a *Network Operator*, the data must only be used by that *User* in operating that *Network Operator's User System* and must not be used for any
other purpose or passed on to, or used by, any other business of that User or to, or by, any person within any other such business or elsewhere.

(c) By the end of week 28

NGET will provide each Network Operator in writing with details of proposed outages in Years 2-5 ahead which may, in NGET's reasonable judgement, affect the performance of that Network Operator's User System.

(d) By the end of week 30

Where NGET or a Network Operator is unhappy with the proposed outages notified to it under (a), (b) or (c) above, as the case may be, equivalent provisions to those set out in OC2.4.1.2.1 (d) will apply.

(e) By the end of week 34

NGET will draw up a draft National Electricity Transmission System outage plan covering the period Years 2 to 5 ahead and NGET will notify each Generator and Network Operator in writing of those aspects of the plan which may operationally affect such Generator (other than those aspects which may operationally affect Embedded Small Power Stations or Embedded Medium Power Stations) or Network Operator. NGET will also indicate where a need may exist to issue other operational instructions or notifications (including but not limited to the requirement for the arming of an Operational Intertripping scheme) or Emergency Instructions to Users in accordance with BC2 to allow the security of the National Electricity Transmission System to be maintained within the Licence Standards.

OC2.4.1.3.3 Operational Planning Phase - Planning for Financial Year 1 ahead

Each calendar year NGET shall update the draft National Electricity Transmission System outage plan prepared under OC2.4.1.3.2 above and shall in addition take into account outages required as a result of maintenance work.

In each calendar year:

(a) By the end of week 13

Generators and Non-Embedded Customers will inform NGET in writing of proposed outages for Year 1 of Generator owned Apparatus at each Grid Entry Point (e.g. busbar selectors) other than Synchronous Generating Units and/or Power Park Modules or Non-Embedded Customer owned Apparatus, as the case may be, at each Grid Supply Point.

(b) By the end of week 28

NGET will provide each Network Operator and each Non-Embedded Customer in writing with details of proposed outages in Year 1 ahead which may, in NGET's reasonable judgement, affect the performance of its User System or the Non-Embedded Customer Apparatus at the Grid Supply Point.
(c) By the end of week 32

Each Network Operator will notify NGET in writing with details of proposed outages in Year 1 in its User System which may affect the performance of the Total System (which includes but is not limited to outages of User System Apparatus at Grid Supply Points and outages which constrain the output of Synchronous Generating Units and/or Power Park Modules Embedded within that User System).

Each Network Operator will notify NGET in writing of details of proposed outages in Year 1 in its User System which may affect the performance of the Total System (which includes but is not limited to outages of User System Apparatus at Grid Supply Points and outages which constrain the output of Synchronous Generating Units and/or Power Park Modules Embedded within that User System).

Network Operators will also notify NGET of any automatic and/or manual post fault actions that it intends to utilise or plans to utilise during such outages.

Each Network Operator will also notify NGET in writing of any revisions to Interface Point Target Voltage/Power Factor data submitted pursuant to PC.A.2.5.4.2.

(d) Between the end of week 32 and the end of week 34

NGET will draw up a revised National Electricity Transmission System outage plan (which for the avoidance of doubt includes Transmission Apparatus at the Connection Points).

(e) By the end of week 34

NGET will notify each Generator and Network Operator, in writing, of those aspects of the National Electricity Transmission System outage programme which may, in NGET’s reasonable opinion, operationally affect that Generator (other than those aspects which may operationally affect Embedded Small Power Stations or Embedded Medium Power Stations) or Network Operator including in particular proposed start dates and end dates of relevant National Electricity Transmission System outages.

NGET will provide to each Network Operator and to each Generator a copy of the information given to NGET under paragraph (c) above (other than the information given by that Network Operator). In relation to a Network Operator, the data must only be used by that User in operating that Network Operator's User System and must not be used for any other purpose or passed on to, or used by, any other business of that User or to, or by, any person within any other such business or elsewhere.

(f) By the end of week 36

Where a Generator or Network Operator is unhappy with the proposed aspects notified to it under (e) above, equivalent provisions to those set out in OC2.4.1.2.1 (d) will apply.
(g) **Between the end of week 34 and 49**

**NGET** will draw up a final **National Electricity Transmission System** outage plan covering Year 1.

(h) **By the end of week 49**

(i) **NGET** will complete the final **National Electricity Transmission System** outage plan for Year 1. The plan for Year 1 becomes the final plan for Year 0 when by expiry of time Year 1 becomes Year 0.

(ii) **NGET** will notify each **Generator** and each **Network Operator** in writing of those aspects of the plan which may operationally affect such **Generator** (other than those aspects which may operationally affect **Embedded Small Power Stations** or **Embedded Medium Power Stations**) or **Network Operator** including in particular proposed start dates and end dates of relevant **National Electricity Transmission System** outages. **NGET** will also indicate where a need may exist to issue other operational instructions or notifications (including but not limited to the requirement for the arming of an **Operational Intertripping** scheme) or **Emergency Instructions** to **Users** in accordance with **BC2** to allow the security of the **National Electricity Transmission System** to be maintained within the **Licence Standards**. **NGET** will also inform each relevant **Non-Embedded Customer** of the aspects of the plan which may affect it.

(iii) In addition, in relation to the final **National Electricity Transmission System** outage plan for Year 1, **NGET** will provide to each **Generator** a copy of the final **National Electricity Transmission System** outage plan for that year. **OC2.4.1.3.4** contains provisions whereby updates of the final **National Electricity Transmission System** outage plan are provided. The plan and the updates will be provided in writing. It should be noted that the final **National Electricity Transmission System** outage plan for Year 1 and the updates will not give a complete understanding of how the **National Electricity Transmission System** will operate in real time, where the **National Electricity Transmission System** operation may be affected by other factors which may not be known at the time of the plan and the updates. Therefore, **Users** should place no reliance on the plan or the updates showing a set of conditions which will actually arise in real time.

(i) **Information Release or Exchange**

This paragraph (i) contains alternative requirements on **NGET**, paragraph (z) being an alternative to a combination of paragraphs (x) and (y). Paragraph (z) will only apply in relation to a particular **User** if **NGET** and that **User** agree that it should apply, in which case paragraphs (x) and (y) will not apply. In the absence of any relevant agreement between **NGET** and the **User**, **NGET** will only be required to comply with paragraphs (x) and (y).

**Information Release to each Network Operator and Non-Embedded Customer**
Between the end of Week 34 and 49 NGET will upon written request:

(x) for radial systems, provide each Network Operator and Non Embedded Customer with data to allow the calculation by the Network Operator, and each Non Embedded Customer, of symmetrical and asymmetrical fault levels; and

(y) for interconnected Systems, provide to each Network Operator an equivalent network, sufficient to allow the identification of symmetrical and asymmetrical fault levels, and power flows across interconnecting User Systems directly connected to the National Electricity Transmission System; or

System Data Exchange

(z) as part of a process to facilitate understanding of the operation of the Total System,

(1) NGET will make available to each Network Operator, the National Electricity Transmission System Study Network Data Files covering Year 1 which are of relevance to that User’s System;

(2) where NGET and a User have agreed to the use of data links between them, the making available will be by way of allowing the User access to take a copy of the National Electricity Transmission System Study Network Data Files once during that period. The User may, having taken that copy, refer to the copy as often as it wishes. Such access will be in a manner agreed by NGET and may be subject to separate agreements governing the manner of access. In the absence of agreement, the copy of the National Electricity Transmission System Study Network Data Files will be given to the User on a disc, or in hard copy, as determined by NGET;

(3) the data contained in the National Electricity Transmission System Study Network Data Files represents NGET’s view of operating conditions although the actual conditions may be different;

(4) NGET will notify each Network Operator, as soon as reasonably practicable after it has updated the National Electricity Transmission System Study Network Data Files covering Year 1 that it has done so, when this update falls before the next annual update under this OC2.4.1.3.3(i). NGET will then make available to each Network Operator who has received an earlier version (and in respect of whom the agreement still exists), the updated National Electricity Transmission System Study Network Files covering the balance of Years 1 and 2 which remain given the passage of time, and which are of relevance to that User’s System. The provisions of paragraphs (2) and (3) above shall apply to the making available of these updates;

(5) the data from the National Electricity Transmission System Study Network Data Files received by each Network Operator
must only be used by that User in operating that Network Operator's User System and must not be used for any other purpose or passed on to, or used by, any other business of that User or to, or by, any person within any other such business or elsewhere.

OC2.4.1.3.4 Operational Planning Phase - Planning in Financial Year 0 down to the Programming Phase (and in the case of load transfer capability, also during the Programming Phase)

(a) The National Electricity Transmission System outage plan for Year 1 issued under OC2.4.1.3.3 shall become the plan for Year 0 when by expiry of time Year 1 becomes Year 0.

(b) Each Generator or Network Operator or Non-Embedded Customer may at any time during Year 0 request NGET in writing for changes to the outages requested by them under OC2.4.1.3.3. In relation to that part of Year 0, excluding the period 1-7 weeks from the date of request, NGET shall determine whether the changes are possible and shall notify the Generator, Network Operator or Non-Embedded Customer in question whether this is the case as soon as possible, and in any event within 14 days of the date of receipt by NGET of the written request in question.

Where NGET determines that any change so requested is possible and notifies the relevant User accordingly, NGET will provide to each Network Operator and each Generator a copy of the request to which NGET has agreed which relates to outages on Systems of Network Operators (other than any request made by that Network Operator). The information must only be used by that Network Operator in operating that Network Operator's User System and must not be used for any other purpose or passed on to, or used by, any other business of that User or to, or by, any person within any other such business or elsewhere.

(c) During Year 0 (including the Programming Phase) each Network Operator shall at NGET's request make available to NGET such details of automatic and manual load transfer capability of:

(i) 12MW or more (averaged over any half hour) for England and Wales
(ii) 10MW or more (averaged over any half hour) for Scotland

between Grid Supply Points.

During Year 0 (including the Programming Phase) each Network Operator shall notify NGET of any revisions to the information provided pursuant to OC2.4.1.3.3 (c) for Interface Points as soon as reasonably practicable after the Network Operator becomes aware of the need to make such revisions.

(d) When necessary during Year 0, NGET will notify each Generator and Network Operator and each Non-Embedded Customer, in writing of those aspects of the National Electricity Transmission System outage programme in the period from the 8th week ahead to the 52nd week ahead, which may, in NGET's reasonable opinion, operationally affect that Generator (other than those aspects which may operationally affect Embedded Small Power Stations or Embedded Medium Power Stations) or Network Operator or Non-Embedded Customer including
in particular proposed start dates and end dates of relevant National Electricity Transmission System outages.

NGET will also notify changes to information supplied by NGET pursuant to OC2.4.1.3.3(i)(x) and (y) except where in relation to a User information was supplied pursuant to OC2.4.1.3.3(i)(z). In that case:-

(i) NGET will, by way of update of the information supplied by it pursuant to OC2.4.1.3.3(i)(z), make available at the first time in Year 0 that it updates the National Electricity Transmission System Study Network Data Files in respect of Year 0 (such update being an update on what was shown in respect of Year 1 which has then become Year 0) to each Network Operator who has received an earlier version under OC2.4.1.3.3(i)(z) (and in respect of whom the agreement still exists), the National Electricity Transmission System Study Network Data Files covering Year 0 which are of relevance to that User's System.

(ii) NGET will notify each relevant Network Operator, as soon as reasonably practicable after it has updated the National Electricity Transmission System Study Network Data Files covering Year 0, that it has done so. NGET will then make available to each such Network Operator, the updated National Electricity Transmission System Study Network Data Files covering the balance of Year 0 which remains given the passage of time, and which are of relevance to that User's System.

(iii) The provisions of OC2.4.1.3.3(i)(z)(2), (3) and (5) shall apply to the provision of data under this part of OC2.4.1.3.4(d) as if set out in full.

NGET will also indicate where a need may exist to issue other operational instructions or notifications (including but not limited to the requirement for the arming of an Operational Intertipping scheme) or Emergency Instructions to Users in accordance with BC2 to allow the security of the National Electricity Transmission System to be maintained within the Licence Standards.

(e) In addition, by the end of each month during Year 0, NGET will provide to each Generator a notice containing any revisions to the final National Electricity Transmission System outage plan for Year 1, provided to the Generator under OC2.4.1.3.3 or previously under this provision, whichever is the more recent.

OC2.4.1.3.5 Programming Phase

(a) By 1600 hours each Thursday

(i) NGET shall continue to update a preliminary National Electricity Transmission System outage programme for the eighth week ahead, a provisional National Electricity Transmission System outage programme for the next week ahead and a final day ahead National Electricity Transmission System outage programme for the following day.

(ii) NGET will notify each Generator and Network Operator and each Non-Embedded Customer, in writing of those aspects of the
preliminary National Electricity Transmission System outage programme which may operationally affect each Generator (other than those aspects which may operationally affect Embedded Small Power Stations or Embedded Medium Power Stations) or Network Operator and each Non-Embedded Customer including in particular proposed start dates and end dates of relevant National Electricity Transmission System outages.

NGET will also notify changes to information supplied by NGET pursuant to OC2.4.1.3.3(i)(x) and (y) except where in relation to a User information was supplied pursuant to OC2.4.1.3.3(i)(z). In that case:-

1. NGET will, by way of update of the information supplied by it pursuant to OC2.4.1.3.3(i)(z), make available the National Electricity Transmission System Study Network Data Files for the next week ahead and

2. NGET will notify each relevant Network Operator, as soon as reasonably practicable after it has updated the National Electricity Transmission System Study Network Data Files covering the next week ahead that it has done so, and

3. The provisions of OC2.4.1.3.3(i)(z)(2), (3) and (5) shall apply to the provision of data under this part of OC2.4.1.3.5(a)(ii) as if set out in full.

NGET may make available the National Electricity Transmission System Study Network Data Files for the next week ahead where NGET and a particular User agree, and in such case the provisions of OC2.4.1.3.3(i)(x) and (y) and the provisions of OC2.4.1.3.4(d) and OC2.4.1.3.5(a) which relate to OC2.4.1.3.3(i)(x) and (y) shall not apply. In such case the provisions of this OC2.4.1.3.5(a)(ii)2 and 3 shall apply to the provision of the data under this part of OC2.4.1.3.5(a)(ii) as if set out in full.

NGET will also indicate where a need may exist to arm an Operational Intertripping scheme, emergency switching, emergency Demand management or other measures including the issuing of other operational instructions or notifications or Emergency Instructions to Users in accordance with BC2 to allow the security of the National Electricity Transmission System to be maintained within the Licence Standards.

(b) By 1000 hours each Friday

Generators and Network Operators will discuss with NGET and confirm in writing to NGET, acceptance or otherwise of the requirements detailed under OC2.4.1.3.5.

Network Operators shall confirm for the following week:

(i) the details of any outages of its User System that will restrict the Maximum Export Capacity and/or Maximum Import Capacity at any Interface Points within its User System for the following week; and
(ii) any changes to the previously declared values of the **Interface Point Target Voltage/Power Factor**.

(c) By 1600 hours each Friday

(i) **NGET** shall finalise the preliminary **National Electricity Transmission System** outage programme up to the seventh week ahead. **NGET** will endeavour to give as much notice as possible to a **Generator** with nuclear **Large Power Stations** which may be operationally affected by an outage which is to be included in such programme.

(ii) **NGET** shall finalise the provisional **National Electricity Transmission System** outage programme for the next week ahead.

(iii) **NGET** shall finalise the **National Electricity Transmission System** outage programme for the weekend through to the next normal working day.

(iv) In each case **NGET** will indicate the factors set out in (a)(ii) above (other than those aspects which may operationally affect **Embedded Small Power Stations** or **Embedded Medium Power Stations**) to the relevant **Generators** and **Network Operators** and **Non-Embedded Customers**.

(v) Where a **Generator** with nuclear **Large Power Stations** which may be operationally affected by the preliminary **National Electricity Transmission System** outage programme referred to in (i) above (acting as a reasonable operator) is concerned on grounds relating to safety about the effect which an outage within such outage programme might have on one or more of its nuclear **Large Power Stations**, it may contact **NGET** to explain its concerns and discuss whether there is an alternative way of taking that outage (having regard to technical feasibility). If there is such an alternative way, but **NGET** refuses to adopt that alternative way in taking that outage, that **Generator** may involve the **Disputes Resolution Procedure** to decide on the way the outage should be taken. If there is no such alternative way, then **NGET** may take the outage despite that **Generator's** concerns.

(d) By 1600 hours each Monday, Tuesday, Wednesday and Thursday

(i) **NGET** shall prepare a final **National Electricity Transmission System** outage programme for the following day.

(ii) **NGET** shall notify each **Generator** and **Network Operator** and **Non-Embedded Customer** in writing of the factors set out in (a)(ii) above (other than those aspects which may operationally affect **Embedded Small Power Stations** or **Embedded Medium Power Stations**).

**OC2.4.2 DATA REQUIREMENTS**

**OC2.4.2.1** When a **Statement of Readiness** under the **Bilateral Agreement** and/or **Construction Agreement** is submitted, and thereafter in calendar week 24 in each calendar year,
(a) each Generator shall (subject to OC2.4.2.1(k)) in respect of each of its:-

(i) Gensets (in the case of the Generation Planning Parameters); and

(ii) CCGT Units within each of its CCGT Modules at a Large Power Station (in the case of the Generator Performance Chart)

submit to NGET in writing the Generation Planning Parameters and the Generator Performance Chart.

(b) Each shall meet the requirements of CC.6.3.2 and shall reasonably reflect the true operating characteristics of the Genset.

(c) They shall be applied (unless revised under this OC2 or (in the case of the Generator Performance Chart only) BC1 in relation to Other Relevant Data) from the Completion Date, in the case of the ones submitted with the Statement of Readiness, and in the case of the ones submitted in calendar week 24, from the beginning of week 25 onwards.

(d) They shall be in the format indicated in Appendix 1 for these charts and as set out in Appendix 2 for the Generation Planning Parameters.

(e) Any changes to the Generator Performance Chart or Generation Planning Parameters should be notified to NGET promptly.

(f) Generators should note that amendments to the composition of the CCGT Module or Power Park Module at Large Power Stations may only be made in accordance with the principles set out in PC.A.3.2.3 or PC.A.3.2.4 respectively. If in accordance with PC.A.3.2.3 or PC.A.3.2.4 an amendment is made, any consequential changes to the Generation Planning Parameters should be notified to NGET promptly.

(g) The Generator Performance Chart must be as described below and demonstrate the limitation on reactive capability of the System voltage at 3% above nominal. It must also include any limitations on output due to the prime mover (both maximum and minimum), Generating Unit step up transformer or User System.

(i) For a Synchronous Generating Unit on a Generating Unit specific basis at the Generating Unit Stator Terminals. It must include details of the Generating Unit transformer parameters.

(ii) For a Non-Synchronous Generating Unit (excluding a Power Park Unit) on a Generating Unit specific basis at the Grid Entry Point (or User System Entry Point if Embedded).

(iii) For a Power Park Module, on a Power Park Module specific basis at the Grid Entry Point (or User System Entry Point if Embedded).

(iv) For a DC Converter on a DC Converter specific basis at the Grid Entry Point (or User System Entry Point if Embedded).
(h) For each CCGT Unit, and any other Generating Unit or Power Park Module whose performance varies significantly with ambient temperature, the Generator Performance Chart shall show curves for at least two values of ambient temperature so that NGET can assess the variation in performance over all likely ambient temperatures by a process of linear interpolation or extrapolation. One of these curves shall be for the ambient temperature at which the Generating Unit's output, or CCGT Module at a Large Power Station output or Power Park Module's output, as appropriate, equals its Registered Capacity.

(i) The Generation Planning Parameters supplied under OC2.4.2.1 shall be used by NGET for operational planning purposes only and not in connection with the operation of the Balancing Mechanism (subject as otherwise permitted in the BCs).

(j) Each Generator shall in respect of each of its CCGT Modules at Large Power Stations submit to NGET in writing a CCGT Module Planning Matrix. It shall be prepared on a best estimate basis relating to how it is anticipated the CCGT Module will be running and which shall reasonably reflect the true operating characteristics of the CCGT Module. It will be applied (unless revised under this OC2) from the Completion Date, in the case of the one submitted with the Statement of Readiness, and in the case of the one submitted in calendar week 24, from the beginning of week 31 onwards. It must show the combination of CCGT Units which would be running in relation to any given MW output, in the format indicated in Appendix 3.

Any changes must be notified to NGET promptly. Generators should note that amendments to the composition of the CCGT Module at Large Power Stations may only be made in accordance with the principles set out in PC.A.3.2.3. If in accordance with PC.A.3.2.3 an amendment is made, an updated CCGT Module Planning Matrix must be immediately submitted to NGET in accordance with this OC2.4.2.1(b).

The CCGT Module Planning Matrix will be used by NGET for operational planning purposes only and not in connection with the operation of the Balancing Mechanism.

(k) Each Generator shall in respect of each of its Cascade Hydro Schemes also submit the Generation Planning Parameters detailed at OC2.A.2.6 to OC2.A.2.10 for each Cascade Hydro Scheme. Such parameters need not also be submitted for the individual Gensets within such Cascade Hydro Scheme.

(l) Each Generator shall in respect of each of its Power Park Modules at Large Power Stations submit to NGET in writing a Power Park Module Planning Matrix. It shall be prepared on a best estimate basis relating to how it is anticipated the Power Park Module will be running and which shall reasonably reflect the operating characteristics of the Power Park Module. It will be applied (unless revised under this OC2) from the Completion Date, in the case of the one submitted with the Statement of Readiness, and in the case of the one submitted in calendar week 24, from the beginning of week 31 onwards. It must show the number of each type of Power Park Unit in the Power Park Module typically expected to be available to generate, in the format indicated in Appendix 4. The Power Park Module Planning Matrix shall be accompanied by a graph showing
the variation in MW output with **Intermittent Power Source** (e.g. MW vs wind speed) for the **Power Park Module**. The graph shall indicate the typical value of the **Intermittent Power Source** for the **Power Park Module**.

Any changes must be notified to **NGET** promptly. **Generators** should note that amendments to the composition of the **Power Park Module at Large Power Stations** may only be made in accordance with the principles set out in PC.A.3.2.4. If in accordance with PC.A.3.2.4 an amendment is made, an updated **Power Park Module Planning Matrix** must be immediately submitted to **NGET** in accordance with this OC2.4.2.1(a).

The **Power Park Module Planning Matrix** will be used by **NGET** for operational planning purposes only and not in connection with the operation of the **Balancing Mechanism**.

**OC2.4.2.2** Each **Network Operator** shall by 1000 hrs on the day falling seven days before each **Operational Day** inform **NGET** in writing of any changes to the circuit details called for in PC.A.2.2.1 which it is anticipated will apply on that **Operational Day** (under BC1 revisions can be made to this data).
OC2.4.3  NEGATIVE RESERVE ACTIVE POWER MARGINS

OC2.4.3.1 In each calendar year, by the end of week 39 NGET will, taking into account the Final Generation Outage Programme and forecast of Output Usable supplied by each Generator, issue a notice in writing to:-

(a) all Generators with Large Power Stations listing any period in which there is likely to be an unsatisfactory System NRAPM; and

(b) all Generators with Large Power Stations which may, in NGET's reasonable opinion be affected, listing any period in which there is likely to be an unsatisfactory Localised NRAPM, together with the identity of the relevant System Constraint Group or Groups,

within the next calendar year, together with the margin. NGET and each Generator will take these into account in seeking to co-ordinate outages for that period.

OC2.4.3.2 (a) By 0900 hours each Business Day

Each Generator shall provide NGET in writing with a best estimate of Genset inflexibility on a daily basis for the period 2 to 14 days ahead (inclusive).

(b) By 1600 hours each Wednesday

Each Generator shall provide NGET in writing with a best estimate of Genset inflexibility on a weekly basis for the period 2 to 7 weeks ahead (inclusive).

(c) Between 1600 hours each Wednesday and 1200 hours each Friday

(i) If NGET, taking into account the estimates supplied by Generators under (b) above, and forecast Demand for the period, foresees that:-

(1) the level of the System NRAPM for any period within the period 2 to 7 weeks ahead (inclusive) is too low, it will issue a notice in writing to all Generators and Network Operators listing any periods and levels of System NRAPM within that period; and/or

(2) having also taken into account the appropriate limit on transfers to and from a System Constraint Group, the level of Localised NRAPM for any period within the period 2 to 7 weeks ahead (inclusive) is too low for a particular System Constraint Group, it will issue a notice in writing to all Generators and Network Operators which may, in NGET's reasonable opinion be affected by that Localised NRAPM, listing any periods and levels of Localised NRAPM within that period. A separate notice will be given in respect of each affected System Constraint Group.
Outages Adjustments

(ii) NGET will then contact Generators in respect of their Large Power Stations to discuss outages as set out in the following paragraphs of this OC2.4.3.2.

(iii) NGET will contact all Generators in the case of low System NRAPM and will contact Generators in relation to relevant Large Power Stations in the case of low Localised NRAPM. NGET will raise with each Generator the problems it is anticipating due to the low System NRAPM or Localised NRAPM and will discuss:-

1. whether any change is possible to the estimate of Genset inflexibility given under (b) above; and
2. whether Genset outages can be taken to coincide with the periods of low System NRAPM or Localised NRAPM (as the case may be).

In relation to Generators with nuclear Large Power Stations the discussions on outages can include the issue of whether outages can be taken for re-fuelling purposes to coincide with the relevant low System NRAPM and/or Localised NRAPM periods.

(iv) If agreement is reached with a Generator (which unlike the remainder of OC2 will constitute a binding agreement), then such Generator will take such outage, as agreed with NGET, and NGET will issue a revised notice in writing to the Generators and Network Operators to which it sent notices under (i) above, reflecting the changes brought about to the periods and levels of System NRAPM and/or Localised NRAPM by the agreements with Generators.

(d) By 1600 hours each day

(i) If NGET, taking into account the estimates supplied under (a) above, and forecast Demand for the period, foresees that:-

1. the level of System NRAPM for any period within the period of 2 to 14 days ahead (inclusive) is too low, it will issue a notice in writing to all Generators and Network Operators listing the periods and levels of System NRAPM within those periods; and/or
2. having also taken into account the appropriate limit on transfers to and from a System Constraint Group, the level of Localised NRAPM for any period within the period of 2 to 14 days ahead (inclusive) is too low for a particular System Constraint Group, it will issue a notice in writing to all Generators and Network Operators which may, in NGET’s reasonable opinion be affected by that Localised NRAPM, listing any periods and levels of Localised NRAPM within that period. A separate notice will be given in respect of each affected System Constraint Group.

(ii) NGET will contact all Generators in respect of their Large Power Stations (or in the case of Localised NRAPM, all Generators which
may, in NGET’s reasonable opinion be affected, in respect of their relevant Large Power Stations) to discuss whether any change is possible to the estimate of Genset inflexibility given under (a) above and to consider Large Power Station outages to coincide with the periods of low System NRAPM and/or Localised NRAPM (as the case may be).

(e) If on the day prior to a Operational Day, it is apparent from the BM Unit Data submitted by Users under BC1 that System NRAPM and/or Localised NRAPM (as the case may be) is, in NGET’s reasonable opinion, too low, then in accordance with the procedures and requirements set out in BC1.5.5 NGET may contact Users to discuss whether changes to Physical Notifications are possible, and if they are, will reflect those in the operational plans for the next following Operational Day or will, in accordance with BC2.9.4 instruct Generators to De-Synchronise a specified Genset for such period. In determining which Genset to so instruct, BC2 provides that NGET will not (other than as referred to below) consider in such determination (and accordingly shall not instruct to De-Synchronise) any Genset within an Existing Gas Cooled Reactor Plant. BC2 further provides that:-

(i) NGET is permitted to instruct to De-Synchronise any Gensets within an Existing AGR Plant if those Gensets within an Existing AGR Plant have failed to offer to be flexible for the relevant instance at the request of NGET provided the request is within the Existing AGR Plant Flexibility Limit.

(ii) NGET will only instruct to De-Synchronise any Gensets within an Existing Magnox Reactor Plant or within an Existing AGR Plant (other than under (i) above) if the level of System NRAPM (taken together with System constraints) and/or Localised NRAPM is such that it is not possible to avoid De-Synchronising such Generating Unit, and provided the power flow across each External Interconnection is either at zero or results in an export of power from the Total System. This proviso applies in all cases in the case of System NRAPM and in the case of Localised NRAPM, only when the power flow would have a relevant effect.

OC2.4.4 FREQUENCY SENSITIVE OPERATION

By 1600 hours each Wednesday

OC2.4.4.1 Using such information as NGET shall consider relevant including, if appropriate, forecast Demand, any estimates provided by Generators of Genset inflexibility and anticipated plant mix relating to operation in Frequency Sensitive Mode, NGET shall determine for the period 2 to 7 weeks ahead (inclusive) whether it is possible that there will be insufficient Gensets (other than those Gensets within Existing Gas Cooled Reactor Plant which are permitted to operate in Limited Frequency Sensitive Mode at all times under BC3.5.3) to operate in Frequency Sensitive Mode for all or any part of that period.

OC2.4.4.2 BC3.5.3 explains that NGET permits Existing Gas Cooled Reactor Plant other than Frequency Sensitive AGR Units to operate in a Limited Frequency Sensitive Mode at all times.
OC2.4.4.3 If NGET foresees that there will be an insufficiency in Gensets operating in a Frequency Sensitive Mode, it will contact Generators in order to seek to agree (as soon as reasonably practicable) that all or some of the Gensets (the MW amount being determined by NGET but the Gensets involved being determined by the Generator) will take outages to coincide with such period as NGET shall specify to enable replacement by other Gensets which can operate in a Frequency Sensitive Mode. If agreement is reached (which unlike the remainder of OC2 will constitute a binding agreement) then such Generator will take such outage as agreed with NGET. If agreement is not reached, then the provisions of BC2.9.5 may apply.

OC2.4.5 If in NGET's reasonable opinion it is necessary for both the procedure set out in OC2.4.3 (relating to System NRAPM and Localised NRAPM) and in OC2.4.4 (relating to operation in Frequency Sensitive Mode) to be followed in any given situation, the procedure set out in OC2.4.3 will be followed first, and then the procedure set out in OC2.4.4. For the avoidance of doubt, nothing in this paragraph shall prevent either procedure from being followed separately and independently of the other.

OC2.4.6 OPERATING MARGIN DATA REQUIREMENTS

OC2.4.6.1 Modifications to relay settings

'Relay settings' in this OC2.4.6.1 refers to the settings of Low Frequency Relays in respect of Gensets that are available for start from standby by Low Frequency Relay initiation with Fast Start Capability agreed pursuant to the Bilateral Agreement.

By 1600 hours each Wednesday

A change in relay settings will be sent by NGET no later than 1600 hours on a Wednesday to apply from 1000 hours on the Monday following. The settings allocated to particular Large Power Stations may be interchanged between 49.70Hz and 49.60Hz (or such other System Frequencies as NGET may have specified) provided the overall capacity at each setting and System requirements can, in NGET's view, be met.

Between 1600 hours each Wednesday and 1200 hours each Friday

If a Generator wishes to discuss or interchange settings it should contact NGET by 1200 hours on the Friday prior to the Monday on which it would like to institute the changes to seek NGET's agreement. If NGET agrees, NGET will then send confirmation of the agreed new settings.

By 1500 hours each Friday

If any alterations to relay settings have been agreed, then the updated version of the current relay settings will be sent to affected Users by 1500 hours on the Friday prior to the Monday on which the changes will take effect. Once accepted, each Generator (if that Large Power Station is not subject to forced outage or Planned Outage) will abide by the terms of its latest relay settings.
In addition, **NGET** will take account of any **Large Power Station** unavailability (as notified under **OC2.4.1.2** submissions) in its total **Operating Reserve** policy.

**NGET** may from time to time, for confirmation purposes only, issue the latest version of the current relay settings to each affected **Generator**

**OC2.4.6.2 Operating Margins**

**By 1600 hours each Wednesday**

No later than 1600 hours on a Wednesday, **NGET** will provide an indication of the level of **Operating Reserve** to be utilised by **NGET** in connection with the operation of the **Balancing Mechanism** in the week beginning with the **Operational Day** commencing during the subsequent Monday, which level shall be purely indicative.

This **Operating Margin** indication will also note the possible level of **Operating Reserve** (if any) which may be provided by **Interconnector Users** in the week beginning with the **Operational Day** commencing during the subsequent Monday.

This **Operating Margin** indication will also note the possible level of **High Frequency Response** to be utilised by **NGET** in connection with the operation of the **Balancing Mechanism** in the week beginning with the **Operational Day** commencing during the subsequent Monday, which level shall be purely indicative.
Where a **Reactive Despatch Network Restriction** is in place which requires following of local voltage conditions, alternatively to (E), please check this box.
Point A is equivalent (in MVar) to: 0.95 leading Power Factor at Rated MW output
Point B is equivalent (in MVar) to: 0.95 lagging Power Factor at Rated MW output
Point C is equivalent (in MVar) to: -5% of Rated MW output
Point D is equivalent (in MVar) to: +5% of Rated MW output
Point E is equivalent (in MVar) to: -12% of Rated MW output
Line F is equivalent (in MVar) to: Leading Power Factor Reactive Despatch Network Restriction
Line G is equivalent (in MVar) to: Lagging Power Factor Reactive Despatch Network Restriction

Where a Reactive Despatch Network Restriction is in place which requires following of local voltage conditions, alternatively to Line F and G, please check this box.
OC2 APPENDIX 2

OC2.A.2  Generation Planning Parameters

The following parameters are required in respect of each Genset.

OC2.A.2.1  Regime Unavailability

Where applicable the following information must be recorded for each Genset.

- Earliest synchronising time:
  Monday
  Tuesday to Friday
  Saturday to Sunday

- Latest de-synchronising time:
  Monday to Thursday
  Friday
  Saturday to Sunday

OC2.A.2.2  Synchronising Intervals

(a) The Synchronising interval between Gensets in a Synchronising Group assuming all Gensets have been Shutdown for 48 hours;

(b) The Synchronising Group within the Power Station to which each Genset should be allocated.

OC2.A.2.3  De-Synchronising Interval

A fixed value De-Synchronising interval between Gensets within a Synchronising Group.

OC2.A.2.4  Synchronising Generation

The amount of MW produced at the moment of Synchronising assuming the Genset has been Shutdown for 48 hours.

OC2.A.2.5  Minimum Non-zero time (MNZT)

The minimum period on-load between Synchronising and De-Synchronising assuming the Genset has been Shutdown for 48 hours.

OC2.A.2.6  Run-Up rates

A run-up characteristic consisting of up to three stages from Synchronising Generation to Output Usable with up to two intervening break points assuming the Genset has been Shutdown for 48 hours.

OC2.A.2.7  Run-down rates

A run down characteristic consisting of up to three stages from Output Usable to De-Synchronising with breakpoints at up to two intermediate load levels.
OC2.A.2.8 Notice to Deviate from Zero (NDZ)

The period of time normally required to Synchronise a Genset following instruction from NGET assuming the Genset has been Shutdown for 48 hours.

OC2.A.2.9 Minimum Zero time (MZT)

The minimum interval between De-Synchronising and Synchronising a Genset.

OC2.A.2.10 Two Shifting Limit

The maximum number of times that a Genset may De-Synchronise per Operational Day.

OC2.A.2.11 Gas Turbine Units loading parameters

- Loading rate for fast starting
- Loading rate for slow starting
### CCGT Module Planning Matrix example form

<table>
<thead>
<tr>
<th>CCGT MODULE</th>
<th>OUTPUT USABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td></td>
</tr>
<tr>
<td>0MW to 150MW</td>
<td>/</td>
</tr>
<tr>
<td>151MW to 250MW</td>
<td>/</td>
</tr>
<tr>
<td>251MW to 300MW</td>
<td>/   /</td>
</tr>
<tr>
<td>301MW to 400MW</td>
<td>/   /   /</td>
</tr>
<tr>
<td>401MW to 450MW</td>
<td>/   /   /</td>
</tr>
<tr>
<td>451MW to 550MW</td>
<td>/   /   /</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CCGT GENERATING UNITS AVAILABLE</th>
<th>1st GT</th>
<th>2nd GT</th>
<th>3rd GT</th>
<th>4th GT</th>
<th>5th GT</th>
<th>6th GT</th>
<th>1st ST</th>
<th>2nd ST</th>
<th>3rd ST</th>
</tr>
</thead>
<tbody>
<tr>
<td>OUTPUT USABLE</td>
<td>150</td>
<td>150</td>
<td>150</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
## Power Park Module Planning Matrix example form

<table>
<thead>
<tr>
<th>POWER PARK UNITS AVAILABLE</th>
<th>POWER PARK UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type A</td>
</tr>
<tr>
<td>Description (Make / Model)</td>
<td></td>
</tr>
<tr>
<td>Number of units</td>
<td></td>
</tr>
</tbody>
</table>

The **Power Park Module Planning Matrix** may have as many columns as are required to provide information on the different make and model for each type of **Power Park Unit** in a **Power Park Module**. The description is required to assist identification of the **Power Park Units** within the **Power Park Module** and correlation with data provided under the **Planning Code**.

< End of OC2 >
OPERATING CODE NO. 3

Not Used

(This contents page does not form part of the Grid Code)
OPERATING CODE NO. 4

Not Used

(This contents page does not form part of the Grid Code)
OPERATING CODE NO. 5
TESTING AND MONITORING

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(This contents page does not form part of the Grid Code)

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</tr>
</tbody>
</table>
OPERATING CODE NO. 5

TESTING AND MONITORING

OC5.1 INTRODUCTION

Operating Code No. 5 ("OC5") specifies the procedures to be followed by NGET in carrying out:

(a) monitoring

(i) of BM Units against their expected input or output;

(ii) of compliance by Users with the CC and in the case of response to Frequency, BC3; and

(iii) of the provision by Users of Ancillary Services which they are required or have agreed to provide; and

(b) the following tests (which are subject to System conditions prevailing on the day):

(i) tests on Gensets, CCGT Modules, Power Park Modules, DC Converters and Generating Units (excluding Power Park Units) to test that they have the capability to comply with the CC and, in the case of response to Frequency, BC3 and to provide the Ancillary Services that they are either required or have agreed to provide;

(ii) tests on BM Units, to ensure that the BM Units are available in accordance with their submitted Export and Import Limits, QPNs, Joint BM Unit Data and Dynamic Parameters.

The OC5 tests include the Black Start Test procedure.

OC5 also specifies in OC5.8 the procedures which apply to the monitoring and testing of Embedded Medium Power Stations not subject to a Bilateral Agreement and Embedded DC Converter Stations not subject to a Bilateral Agreement.

In respect of a Cascade Hydro Scheme the provisions of OC5 shall be applied as follows:

(y) in respect of the BM Unit for the Cascade Hydro Scheme the parameters referred to at OC5.4.1 (a) and (c) in respect of Commercial Ancillary Services will be monitored and tested;

(z) in respect of each Genset forming part of the Cascade Hydro Scheme the parameters referred to at OC5.4.1 (a), (b) and (c) will be tested and monitored. In respect of OC5.4.1 (a) the performance of the Gensets will be tested and monitored against their expected input or output
derived from the data submitted under BC1.4.2(a)(2). Where necessary to give effect to the requirements for **Cascade Hydro Schemes** in the
following provisions of OC5 the term Genset will be read and construed in the place of BM Unit.

In respect of Embedded Exemptable Large Power Stations the provisions of OC5 shall be applied as follows:

(1) where there is a BM Unit registered in the BSC in respect of Generating Units the provisions of OC5 shall apply as written;

(2) in all other cases, in respect of each Generating Unit the parameters referred to at OC5.4.1(a), (b) and (c) will be tested and monitored. In respect of OC5.4.1(a) the performance of the Generating Unit will be tested and monitored against their expected input or output derived from the data submitted under BC1.4.2(a)(2). Where necessary to give effect to the requirements for such Embedded Exemptable Large Power Stations in the provisions of OC5 the term Generating Unit will be read and construed in place of BM Unit.

OC5.2 OBJECTIVE

The objectives of OC5 are to establish:

(a) that Users comply with the CC;

(b) whether BM Units operate in accordance with their expected input or output derived from their Final Physical Notification Data and agreed Bid-Offer Acceptances issued under BC2;

(c) whether each BM Unit is available as declared in accordance with its submitted Export and Import Limits, QPN, Joint BM Unit Data and Dynamic Parameters; and

(d) whether Generators, DC Converter Station owners and Suppliers can provide those Ancillary Services which they are either required or have agreed to provide.

In certain limited circumstances as specified in this OC5 the output of CCGT Units may be verified, namely the monitoring of the provision of Ancillary Services and the testing of Reactive Power and automatic Frequency Sensitive Operation.

OC5.3 SCOPE

OC5 applies to NGET and to Users, which in OC5 means:

(a) Generators;

(b) Network Operators;
(c) Non-Embedded Customers; 
(d) Suppliers; and
(e) DC Converter Station owners.

OC5.4 MONITORING

OC5.4.1 Parameters to be monitored

NGET will monitor the performance of:

(a) BM Units against their expected input or output derived from their Final Physical Notification Data and agreed Bid-Offer Acceptances issued under BC2;
(b) compliance by Users with the CC; and
(c) the provision by Users of Ancillary Services which they are required or have agreed to provide.

OC5.4.2 Procedure for Monitoring

OC5.4.2.1 In the event that a BM Unit fails persistently, in NGET’s reasonable view, to follow, in any material respect, its expected input or output or a User fails persistently to comply with the CC and in the case of response to Frequency, BC3 or to provide the Ancillary Services it is required, or has agreed, to provide, NGET shall notify the relevant User giving details of the failure and of the monitoring that NGET has carried out.

OC5.4.2.2 The relevant User will, as soon as possible, provide NGET with an explanation of the reasons for the failure and details of the action that it proposes to take to:

(a) enable the BM Unit to meet its expected input or output or to provide the Ancillary Services it is required or has agreed to provide, within a reasonable period, or
(b) in the case of a Generating Unit (excluding a Power Park Unit), CCGT Module, Power Park Module or DC Converter to comply with the CC and in the case of response to Frequency, BC3 or to provide the Ancillary Services it is required or has agreed to provide, within a reasonable period.

OC5.4.2.3 NGET and the User will then discuss the action the User proposes to take and will endeavour to reach agreement as to:

(a) any short term operational measures necessary to protect other Users; and
(b) the parameters which are to be submitted for the BM Unit and the effective date(s) for the application of the agreed parameters.
OC5.4.2.4 In the event that agreement cannot be reached within 10 days of notification of the failure by NGET to the User, NGET or the User shall be entitled to require a test, as set out in OC5.5 and OC5.6, to be carried out.

OC5.5 PROCEDURE FOR TESTING

OC5.5.1 Request For Testing

OC5.5.1.1 NGET may at any time (although not normally more than twice in any calendar year in respect of any particular BM Unit) issue an instruction requiring a User to carry out a test, provided NGET has reasonable grounds of justification based upon:

(a) a submission of data, or a statement from a User indicating a change in plant or apparatus or settings (including but not limited to governor and excitation control systems) that may reasonably be expected to result in a material change of performance; or

(b) monitoring carried out in accordance with OC5.4.2; or

(c) notification from a User of completion of an agreed action from OC5.4.2.

OC5.5.1.2 The test, referred to in OC5.5.1.1 and carried out at a time no sooner than 48 hours from the time that the instruction was issued, on any one or more of the User's BM Units should only be to demonstrate that the relevant BM Unit:

(a) if active in the Balancing Mechanism, meets the ability to operate in accordance with its submitted Export and Import Limits, QPN, Joint BM Unit Data and Dynamic Parameters and achieve its expected input or output which has been monitored under OC5.4; and

(b) meets the requirements of the paragraphs in the CC which are applicable to such BM Units; and

in the case of a BM Unit comprising a Generating Unit, a CCGT Module, a Power Park Module or a DC Converter meets,

(c) the requirements for operation in Frequency Sensitive Mode and compliance with the requirements for operation in Limited Frequency Sensitive Mode in accordance with CC.6.3.3, BC3.5.2 and BC3.7.2; or

(d) the terms of the applicable Supplemental Agreement agreed with the Generator to have a Fast Start Capability; or

(e) the Reactive Power capability registered with NGET under OC2 which shall meet the requirements set out in CC.6.3.2. In the case of a test on a Generating Unit within a CCGT Module the instruction need not identify the particular CCGT Unit within the CCGT Module which is to be tested, but instead may specify that a test is to be carried out on one of the CCGT Units within the CCGT Module.

OC5.5.1.3 (a) The instruction referred to in OC5.5.1.1 may only be issued if the relevant User has submitted Export and Import Limits which notify that the relevant BM Unit is available in respect of the Operational Day current at
the time at which the instruction is issued. The relevant User shall then be obliged to submit Export and Import Limits with a magnitude greater than zero for that BM Unit in respect of the time and the duration that the test is instructed to be carried out, unless that BM Unit would not then be available by reason of forced outage or Planned Outage expected prior to this instruction.

(b) In the case of a CCGT Module the Export and Import Limits data must relate to the same CCGT Units which were included in respect of the Operational Day current at the time at which the instruction is issued and must include, in relation to each of the CCGT Units within the CCGT Module, details of the various data set out in BC1.A.1.3 and BC1.A.1.5, which parameters NGET will utilise in instructing in accordance with this OC5 in issuing Bid-Offer Acceptances. The parameters shall reasonably reflect the true operating characteristics of each CCGT Unit.

OC5.5.2 Conduct Of Test

OC5.5.2.1 The performance of the BM Unit will be recorded at Transmission Control Centres notified by NGET with monitoring at site when necessary, from voltage and current signals provided by the User for each BM Unit under CC.6.6.1.

OC5.5.2.2 If monitoring at site is undertaken, the performance of the BM Unit will be recorded on a suitable recorder (with measurements, in the case of a Synchronous Generating Unit, taken on the Generating Unit Stator Terminals / on the LV side of the generator transformer) or in the case of a Non-Synchronous Generating Unit (excluding Power Park Units), Power Park Module or DC Converter at the point of connection in the relevant User's Control Room, in the presence of a reasonable number of representatives appointed and authorised by NGET. If NGET or the User requests, monitoring at site will include measurement of the following parameters:

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

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

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

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

(e) for Power Park Modules: appropriate signals related to the voltage/Reactive Power/Power Factor control system and the Frequency control system as agreed at the time of connection.

(f) for DC Converters: appropriate signals related to the voltage/Reactive Power/Power Factor control system and the Frequency control system as agreed at the time of connection.
OC5.5.2.3  The test will be initiated by the issue of instructions, which may be accompanied by a Bid-Offer Acceptance, under BC2 (in accordance with the Export and Import Limits, QPN, Joint BM Unit Data and Dynamic Parameters which have been submitted for the day on which the test was called, or in the case of a CCGT Unit, in accordance with the parameters submitted under OC5.5.1.3). The instructions in respect of a CCGT Unit within a CCGT Module will be in respect of the CCGT Unit, as provided in BC2.

OC5.5.2.4  The User is responsible for carrying out the test when requested by NGET in accordance with OC5.5.1 and retains the responsibility for the safety of personnel and plant during the test.
The pass criteria must be read in conjunction with the full text under the Grid Code reference. The **BM Unit**, **CCGT Module**, **Power Park Module** or **Generating Unit** (excluding **Power Park Units**) will pass the test if the criteria below are met:

<table>
<thead>
<tr>
<th>Parameter to be Tested</th>
<th>Grid Code Reference</th>
<th>Pass Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harmonic Content</td>
<td>CC.6.1.5(a)</td>
<td>Measured harmonic emissions do not exceed the limits specified in the <strong>Bilateral Agreement</strong> or where no such limits are specified, the relevant planning level specified in G5/4.</td>
</tr>
<tr>
<td>Phase Unbalance</td>
<td>CC.6.1.5(b)</td>
<td>The measured maximum <strong>Phase (Voltage) Unbalance</strong> on the <strong>National Electricity Transmission System</strong> should remain, in England and Wales, below 1% and, in Scotland, below 2% and <strong>Offshore</strong> will be defined in relevant <strong>Bilateral Agreement</strong>.</td>
</tr>
<tr>
<td>Voltage Quality</td>
<td>CC.6.1.6</td>
<td>In England and Wales, measured infrequent short duration peaks in <strong>Phase (Voltage) Unbalance</strong> should not exceed the maximum value stated in the <strong>Bilateral Agreement</strong>.</td>
</tr>
<tr>
<td>Voltage Fluctuations</td>
<td>CC.6.1.7(a)</td>
<td>In England and Wales, measured voltage fluctuations at the <strong>Point of Common Coupling</strong> shall not exceed 1% of the voltage level for step changes. Measured voltage excursions other than step changes may be allowed up to a level of 3%. In Scotland, measured voltage fluctuations at a <strong>Point of Common Coupling</strong> shall not exceed the limits set out in <strong>Engineering Recommendation</strong> P28.</td>
</tr>
<tr>
<td>Flicker</td>
<td>CC.6.1.7(b)</td>
<td>Measured voltage fluctuations at a <strong>Point of Common Coupling</strong> shall not exceed, for voltages above 132kV, <strong>Flicker Severity (Short Term)</strong> of 0.8 Unit and <strong>Flicker Severity (Long Term)</strong> of 0.6 Unit, and, for voltages at 132kV and below, shall not exceed <strong>Flicker Severity (Short Term)</strong> of 1.0 Unit and <strong>Flicker Severity (Long Term)</strong> of 0.8 Unit, as set out in <strong>Engineering Recommendation</strong> P28 as current at the <strong>Transfer Date</strong>.</td>
</tr>
<tr>
<td>Parameter to be Tested</td>
<td>Grid Code Reference</td>
<td>Pass Criteria</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Voltage Fluctuations</td>
<td>CC.6.1.8</td>
<td><strong>Offshore</strong>, measured voltage fluctuations at the <strong>Point of Common Coupling</strong> shall not exceed the limits set out in the <strong>Bilateral Agreement</strong>.</td>
</tr>
<tr>
<td>Fault Clearance Times</td>
<td>CC.6.2.2.2.2(a)</td>
<td>The fault clearance times shall be in accordance with the <strong>Bilateral Agreement</strong>.</td>
</tr>
<tr>
<td></td>
<td>CC.6.2.3.1.1(a)</td>
<td></td>
</tr>
<tr>
<td>Back-Up Protection</td>
<td>CC.6.2.2.2.2(b)</td>
<td>The <strong>Back-Up Protection</strong> system provided by <strong>Generators</strong> operates in the times specified in CC.6.2.2.2.2(b).</td>
</tr>
<tr>
<td></td>
<td>CC.6.2.3.1.1(b)</td>
<td>The <strong>Back-Up Protection</strong> system provided by <strong>Network Operators</strong> and <strong>Non-Embedded Customers</strong> operates in the times specified in CC.6.2.3.1.1(b) and with <strong>Discrimination</strong> as specified in the <strong>Bilateral Agreement</strong>.</td>
</tr>
<tr>
<td>Circuit Breaker fail Protection</td>
<td>CC.6.2.2.2.2(c)</td>
<td>The circuit breaker fail <strong>Protection</strong> shall initiate tripping so as to interrupt the fault current within 200ms.</td>
</tr>
<tr>
<td></td>
<td>CC.6.2.3.1.1(c)</td>
<td></td>
</tr>
<tr>
<td>Reactive Capability</td>
<td>CC.6.3.2</td>
<td>The <strong>Generating Unit</strong>, <strong>DC Converter</strong> or <strong>Power Park Module</strong> will pass the test if it is within ±5% of the reactive capability registered with <strong>NGET</strong> under <strong>OC2</strong> which shall meet the requirements set out in CC.6.3.2.</td>
</tr>
<tr>
<td>Reactive Capability</td>
<td>CC.6.3.4</td>
<td>The duration of the test will be for a period of up to 60 minutes during which period the <strong>System voltage</strong> at the <strong>Grid Entry Point</strong> for the relevant <strong>Generating Unit</strong>, <strong>DC Converter</strong> or <strong>Power Park Module</strong> will be maintained by the <strong>Generator</strong> at the voltage specified pursuant to BC2.8 by adjustment of <strong>Reactive Power</strong> on the remaining <strong>Generating Units</strong>, <strong>DC Converters</strong> or <strong>Power Park Modules</strong>, if necessary. Any test performed in respect of an <strong>Embedded Medium Power Station</strong> not subject to a <strong>Bilateral Agreement</strong> or, an <strong>Embedded DC Converter Station</strong> not subject to a <strong>Bilateral Agreement</strong> shall be as confirmed pursuant to OC5.8.3.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Measurements of the <strong>Reactive Power</strong> output under steady state conditions should be consistent with Grid Code requirements i.e. fully available within the voltage range ±5% at 400kV, 275kV and 132kV and lower voltages.</td>
</tr>
<tr>
<td>Parameter to be Tested</td>
<td>Grid Code Reference</td>
<td>Pass Criteria</td>
</tr>
<tr>
<td>------------------------</td>
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<td>---------------</td>
</tr>
<tr>
<td><strong>Primary, Secondary and High Frequency Response</strong></td>
<td>CC.6.3.4</td>
<td>The measured response in MW/Hz is within ±5% of the level of response specified in the Ancillary Services Agreement for that Genset.</td>
</tr>
<tr>
<td>Stability with Voltage</td>
<td>CC.6.3.7(a)</td>
<td>The measured Active Power output under steady state conditions of any Generating Unit, DC Converter or Power Park Module directly connected to the National Electricity Transmission System should not be affected by voltage changes in the normal operating range.</td>
</tr>
<tr>
<td>Governor Standard</td>
<td>CC.6.3.7(b)</td>
<td>Measurements indicate that the Governor/Frequency control system parameters are within the criteria set out in the appropriate governor/Frequency control system standard (the version of which to apply being determined within CC.6.3.7).</td>
</tr>
<tr>
<td>Governor Stability</td>
<td>CC.6.3.7(c)(ii)</td>
<td>The measured Generating Unit, DC Converter or Power Park Module Active Power Output shall be stable over the entire operating range of the Generating Unit.</td>
</tr>
<tr>
<td>Governor Droop</td>
<td>CC.6.3.7(c)(iii)</td>
<td>The measured speed governor overall speed droop should be between 3% and 5%.</td>
</tr>
<tr>
<td>Governor Deadband</td>
<td>CC.6.3.7(d)</td>
<td>Except for the Steam Unit within a CCGT Module, the measured speed governor/Frequency control system deadband shall be no greater than 0.03Hz (for the avoidance of doubt, ±0.015Hz).</td>
</tr>
<tr>
<td>Target Frequency</td>
<td>CC.6.3.3</td>
<td>Target Frequency settings over at least the range 50 ±0.1 Hz shall be available.</td>
</tr>
<tr>
<td>Response Capability</td>
<td>CC.6.3.3(e) CC.A.3</td>
<td>The measured frequency response of each Generating Unit and/or CCGT Module which has a Completion Date after 1 January 2001 in England and Wales and after 1 April 2005 in Scotland or Offshore shall meet requirement profile contained in Connection Conditions Appendix 3. Similarly for DC Converters with Completion Dates on or after 1 April 2005 and Power Park Modules using the National Electricity Transmission System on or after 1 January 2006 (irrespective of its Completion Date excepting those in Scotland with Completion Date before 1 April 2005).</td>
</tr>
<tr>
<td>Limited High Frequency Response</td>
<td>BC3.7.2(b)</td>
<td>The measured response is within the requirements of BC3.7.2. i.e. the measured rate of change of Active Power output must be at least 2% of output per 0.1Hz deviation of System Frequency above 50.4Hz.</td>
</tr>
<tr>
<td>Output at reduced System Frequency</td>
<td>CC.6.3.3 BC3.5.1</td>
<td>For variations in System Frequency exceeding 0.1Hz within a period of less than 10 seconds, the Active Power output is within ±0.2% of the requirements of CC.6.3.3 when monitored at prevailing external air temperatures of up to 25°C.</td>
</tr>
<tr>
<td>Parameter to be Tested</td>
<td>Grid Code Reference</td>
<td>Pass Criteria</td>
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<tr>
<td>------------------------</td>
<td>---------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Fast Start</td>
<td></td>
<td>The <strong>Fast Start Capability</strong> requirements of the <strong>Ancillary Services Agreement</strong> for that <strong>Genset</strong> are met.</td>
</tr>
<tr>
<td>Black Start</td>
<td>OC.5.7.1</td>
<td>The relevant <strong>Generating Unit</strong> or <strong>Power Park Module</strong> is <strong>Synchronised</strong> to the <strong>System</strong> within two hours of the <strong>Auxiliary Gas Turbine(s)</strong> or <strong>Auxiliary Diesel Engine(s)</strong> being required to start.</td>
</tr>
<tr>
<td>Excitation System/Voltage Control</td>
<td>CC.6.3.8(a) (b) &amp; BC2.11.2</td>
<td>Measurements of the continuously acting automatic excitation control system are required to demonstrate the provision of: (i) constant terminal voltage control; or (ii) zero MVAR transfer; or, (iii) voltage control with a <strong>Slope</strong> of the <strong>Generating Unit, DC Converter</strong> or <strong>Power Park Module</strong> as applicable without instability over the entire operating range of the <strong>Generating Unit, DC Converter</strong> or <strong>Power Park Module</strong>. The measured performance of the automatic excitation or voltage control system should also meet the requirements (including <strong>Power System Stabiliser</strong> performance) specified in the <strong>Bilateral Agreement</strong> or any requirements Specified in an <strong>Embedded Development Agreement</strong>.</td>
</tr>
</tbody>
</table>
Due account will be taken of any conditions on the System which may affect the results of the test. The relevant User must, if requested, demonstrate to NGET's reasonable satisfaction, the reliability of the suitable recorders, disclosing calibration records to the extent appropriate.

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<tr>
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<th>Grid Code Reference</th>
<th>Pass Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export and Import Limits, QPN, Joint BM Unit Data and Dynamic Parameters</td>
<td>OC5</td>
<td>The Export and Import Limits, QPN, Joint BM Unit Data and Dynamic Parameters under test are within 2½% of the declared value being tested. The duration of the test will be consistent with and sufficient to measure the relevant expected input or output derived from the Final Physical Notification Data and Bid-Offer Acceptances issued under BC2 which are still in dispute following the procedure in OC5.4.2.</td>
</tr>
<tr>
<td>Synchronisation time</td>
<td>BC2.5.2.3</td>
<td>Synchronisation takes place within ±5 minutes of the time it should have achieved Synchronisation. The duration of the test will be consistent with and sufficient to measure the relevant expected input or output derived from the Final Physical Notification Data and Bid-Offer Acceptances issued under BC2 which are still in dispute following the procedure in OC5.4.2.</td>
</tr>
<tr>
<td>Dynamic Parameters</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run-up rates</td>
<td>OC5</td>
<td>Achieves the instructed output and, where applicable, the first and/or second intermediate breakpoints, each within ±3 minutes of the time it should have reached such output and breakpoints from Synchronisation (or break point, as the case may be), calculated from the run-up rates in its Dynamic Parameters. The duration of the test will be consistent with and sufficient to measure the relevant expected input or output derived from the Final Physical Notification Data and Bid-Offer Acceptances issued under BC2 which are still in dispute following the procedure in OC5.4.2.</td>
</tr>
<tr>
<td>Run-down rates</td>
<td>OC5</td>
<td>Achieves the instructed output within ±5 minutes of the time, calculated from the run-down rates in its Dynamic Parameters. The duration of the test will be consistent with and sufficient to measure the relevant expected input or output derived from the Final Physical Notification Data and Bid-Offer Acceptances issued under BC2 which are still in dispute following the procedure in OC5.4.2.</td>
</tr>
</tbody>
</table>
OC5.5.4 Test Failure/Re-test

If the BM Unit, CCGT Modules, Power Park Module or Generating Unit (excluding Power Park Units) concerned fails to pass the test the User must provide NGET with a written report specifying in reasonable detail the reasons for any failure of the test so far as they are then known to the User after due and careful enquiry. This must be provided within five Business Days of the test. If a dispute arises relating to the failure, NGET and the relevant User shall seek to resolve the dispute by discussion, and, if they fail to reach agreement, the User may by notice require NGET to carry out a re-test on 48 hours' notice which shall be carried out following the procedure set out in OC5.5.2 and OC5.5.3 and subject as provided in OC5.5.1.3, as if NGET had issued an instruction at the time of notice from the User.

OC5.5.5 Dispute following Re-test

If the BM Unit, CCGT Module, Power Park Module or Generating Unit (excluding Power Park Units) in NGET's view fails to pass the re-test and a dispute arises on that re-test, either party may use the Disputes Resolution Procedure for a ruling in relation to the dispute, which ruling shall be binding.

OC5.6 DISPUTE RESOLUTION

OC5.6.1 If following the procedure set out in OC5.5 it is accepted that the BM Unit, CCGT Module, Power Park Module or Generating Unit (excluding Power Park Units) has failed the test or re-test (as applicable), the User shall within 14 days, or such longer period as NGET may reasonably agree, following such failure, submit in writing to NGET for approval the date and time by which the User shall have brought the BM Unit concerned to a condition where it complies with the relevant requirement. NGET will not unreasonably withhold or delay its approval of the User's proposed date and time submitted. Should NGET not approve the User's proposed date or time (or any revised proposal), the User should amend such proposal having regard to any comments NGET may have made and re-submit it for approval.

OC5.6.2 If a BM Unit fails the test, the User shall submit revised Export and Import Limits, QPN, Joint BM Unit Data and/or Dynamic Parameters, or in the case of a BM Unit comprising a Generating Unit, CCGT Module, DC Converter or Power Park Module, the User may amend, with NGET's approval, the relevant registered parameters of that Generating Unit, CCGT Module, DC Converter or Power Park Module, as the case may be, relating to the criteria, for the period of time until the BM Unit can achieve the parameters previously registered, as demonstrated in a re-test.

OC5.6.3 Once the User has indicated to NGET the date and time that the BM Unit, CCGT Module, Power Park Module or Generating Unit (excluding Power Park Units) can achieve the parameters previously registered or submitted, NGET shall either accept this information or require the User to demonstrate the restoration of the capability by means of a repetition of the test referred to in OC5.5.2 by an instruction requiring the User on 48 hours notice to carry out such a test. The provisions of this OC5.6 will apply to such further test.
OC5.7 BLACK START TESTING

OC.5.7.1 General

(a) NGET may require a Generator with a Black Start Station to carry out a test (a "Black Start Test") on a Genset in a Black Start Station either while the Black Start Station remains connected to an external alternating current electrical supply (a "BS Unit Test") or while the Black Start Station is disconnected from all external alternating current electrical supplies (a "BS Station Test"), in order to demonstrate that a Black Start Station has a Black Start Capability.

(b) Where NGET requires a Generator with a Black Start Station to carry out a BS Unit Test, NGET shall not require the Black Start Test to be carried out on more than one Genset at that Black Start Station at the same time, and would not, in the absence of exceptional circumstances, expect any of the other Genset at the Black Start Station to be directly affected by the BS Unit Test.

(c) NGET may require a Generator with a Black Start Station to carry out a BS Unit Test at any time (but will not require a BS Unit Test to be carried out more than once in each calendar year in respect of any particular Genset unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test, and will not require a BS Station Test to be carried out more than once in every two calendar years in respect of any particular Genset unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test).

(d) When NGET wishes a Generator with a Black Start Station to carry out a Black Start Test, it shall notify the relevant Generator at least 7 days prior to the time of the Black Start Test with details of the proposed Black Start Test.

OC.5.7.2 Procedure for a Black Start Test

The following procedure will, so far as practicable, be carried out in the following sequence for Black Start Tests:

OC.5.7.2.1 BS Unit Tests

(a) The relevant Generating Unit shall be Synchronised and Loaded;

(b) All the Auxiliary Gas Turbines and/or Auxiliary Diesel Engines in the Black Start Station in which that Generating Unit is situated, shall be Shutdown.

(c) The Generating Unit shall be De-Loaded and De-Synchronised and all alternating current electrical supplies to its Auxiliaries shall be disconnected.

(d) The Auxiliary Gas Turbine(s) or Auxiliary Diesel Engine(s) to the relevant Generating Unit shall be started, and shall re-energise the Unit Board of the relevant Generating Unit.
(e) The **Auxiliaries** of the relevant **Generating Unit** shall be fed by the **Auxiliary Gas Turbine(s)** or **Auxiliary Diesel Engine(s)**, via the **Unit Board**, to enable the relevant **Generating Unit** to return to **Synchronous Speed**.

(f) The relevant **Generating Unit** shall be **Synchronised** to the **System** but not **Loaded**, unless the appropriate instruction has been given by **NGET** under BC2.

**OC.5.7.2.2 BS Station Test**

(a) All **Generating Units** at the **Black Start Station**, other than the **Generating Unit** on which the **Black Start Test** is to be carried out, and all the **Auxiliary Gas Turbines** and/or **Auxiliary Diesel Engines** at the **Black Start Station**, shall be **Shutdown**.

(b) The relevant **Generating Unit** shall be **Synchronised** and **Loaded**.

(c) The relevant **Generating Unit** shall be **De-Loaded** and **De-Synchronised**.

(d) All external alternating current electrical supplies to the **Unit Board** of the relevant **Generating Unit**, and to the **Station Board** of the relevant **Black Start Station**, shall be disconnected.

(e) An **Auxiliary Gas Turbine** or **Auxiliary Diesel Engine** at the **Black Start Station** shall be started, and shall re-energise either directly, or via the **Station Board**, the **Unit Board** of the relevant **Generating Unit**.

(f) The provisions of **OC.5.7.2.1 (e)** and **(f)** shall thereafter be followed.

**OC.5.7.2.3 All Black Start Tests** shall be carried out at the time specified by **NGET** in the notice given under **OC5.7.1(d)** and shall be undertaken in the presence of a reasonable number of representatives appointed and authorised by **NGET**, who shall be given access to all information relevant to the **Black Start Test**.

**OC.5.7.2.4 Failure of a Black Start Test**

A **Black Start Station** shall fail a **Black Start Test** if the **Black Start Test** shows that it does not have a **Black Start Capability** (ie. if the relevant **Generating Unit** fails to be **Synchronised** to the **System** within two hours of the **Auxiliary Gas Turbine(s)** or **Auxiliary Diesel Engine(s)** being required to start).

**OC.5.7.2.5** If a **Black Start Station** fails to pass a **Black Start Test** the **Generator** must provide **NGET** with a written report specifying in reasonable detail the reasons for any failure of the test so far as they are then known to the **Generator** after due and careful enquiry. This must be provided within five **Business Days** of the test. If a dispute arises relating to the failure, **NGET** and the relevant **Generator** shall seek to resolve the dispute by discussion, and if they fail to
reach agreement, the **Generator** may require **NGET** to carry out a further **Black Start Test** on 48 hours notice which shall be carried out following the procedure set out in OC.5.7.2.1 or OC.5.7.2.2 as the case may be, as if **NGET** had issued an instruction at the time of notice from the **Generator**.

**OC.5.7.2.6** If the **Black Start Station** concerned fails to pass the re-test and a dispute arises on that re-test, either party may use the **Disputes Resolution Procedure** for a ruling in relation to the dispute, which ruling shall be binding.

**OC.5.7.2.7** If following the procedure in OC.5.7.2.5 and OC.5.7.2.6 it is accepted that the **Black Start Station** has failed the **Black Start Test** (or a re-test carried out under OC.5.7.2.5), within 14 days, or such longer period as **NGET** may reasonably agree, following such failure, the relevant **Generator** shall submit to **NGET** in writing for approval, the date and time by which that **Generator** shall have brought that **Black Start Station** to a condition where it has a **Black Start Capability** and would pass the **Black Start Test**, and **NGET** will not unreasonably withhold or delay its approval of the **Generator's** proposed date and time submitted. Should **NGET** not approve the **Generator's** proposed date and time (or any revised proposal) the **Generator** shall revise such proposal having regard to any comments **NGET** may have made and resubmit it for approval.

**OC.5.7.2.8** Once the **Generator** has indicated to **NGET** that the **Generating Station** has a **Black Start Capability**, **NGET** shall either accept this information or require the **Generator** to demonstrate that the relevant **Black Start Station** has its **Black Start Capability** restored, by means of a repetition of the **Black Start Test** referred to in OC5.7.1(d) following the same procedure as for the initial **Black Start Test**. The provisions of this OC.5.7.2 will apply to such test.

**OC.5.8** **PROCEDURES APPLYING TO EMBEDDED MEDIUM POWER STATION NOT SUBJECT TO A BILATERAL AGREEMENT AND EMBEDDED DC CONVERTER STATIONS NOT SUBJECT TO A BILATERAL AGREEMENT**

**OC5.8.1** Compliance Statement

Each **Network Operator** shall ensure that each **Embedded Person** provides to the **Network Operator** upon **NGET**’s request:

(a) written confirmation that each such **Generating Unit**, **Power Park Module** or **DC Converter** complies with the requirements of the **CC**; and

(b) evidence, where requested, reasonably satisfactory to **NGET**, of such compliance. Such a request shall not normally be made by **NGET** more than twice in any calendar year in respect of any **Generator's Generating Unit** or **Power Park Module** or **DC Converter** owner's **DC Converter**.

The **Network Operator** shall provide the evidence or written confirmation required under OC5.8.1 (a) and (b) forthwith upon receipt to **NGET**.
OC5.8.2 Network Operator’s Obligations to Facilitate Tests

If:

(a) the Network Operator fails to procure the confirmation referred to at OC5.8.1(a); or

(b) the evidence of compliance is not to NGET’s reasonable satisfaction,

then, NGET shall be entitled to require the Network Operator to procure access upon terms reasonably satisfactory to NGET to enable NGET to witness the Embedded Person carrying out the tests referred to in OC5.8.3 in respect of the relevant Embedded Medium Power Station or Embedded DC Converter Station.

OC5.8.3 Testing of Embedded Medium Power Stations not subject to a Bilateral Agreement or Embedded DC Converter Stations not subject to a Bilateral Agreement

NGET may, in accordance with the provisions of OC5.8.2, at any time (although not normally more than twice in any calendar year in respect of any particular Embedded Medium Power Station not subject to a Bilateral Agreement or Embedded DC Converter Station not subject to a Bilateral Agreement) issue an instruction requiring the Network Operator within whose System the relevant Medium Power Station not subject to a Bilateral Agreement or DC Converter Station not subject to a Bilateral Agreement is Embedded, to require the Embedded Person to carry out a test.

Such test shall be carried out at a time no sooner than 48 hours from the time that the instruction was issued, on any one or more of the Generating Units, Power Park Module or DC Converter comprising part of the relevant Embedded Medium Power Station or Embedded DC Converter Station and should only be to demonstrate that:

(a) the relevant Generating Unit, Power Park Module or DC Converter meets the requirements of the paragraphs in the CC which are applicable to such Generating Units, Power Park Module or DC Converter;

(b) the Reactive Power capability registered with NGET under OC2 meets the requirements set out in CC.6.3.2.

The instruction may only be issued where, following consultation with the relevant Network Operator, NGET has:

(a) confirmed to the relevant Network Operator the manner in which the test will be conducted, which shall be consistent with the principles established in OC5.5.2; and

(b) received confirmation from the relevant Network Operator that the relevant Generating Unit, Power Park Module or DC Converter would not then be unavailable by reason of forced outage or Planned Outage expected prior to the instruction.
The relevant **Network Operator** is responsible for ensuring the performance of any test so required by **NGET** and the **Network Operator** shall ensure that the **Embedded Person** retains the responsibility for ensuring the safety of personnel and plant during the test.

**OC5.8.4 Test Failures/Re-tests and Disputes**

The relevant **Network Operator** shall:

(a) ensure that provisions equivalent to OC5.5.4, OC5.5.5 and OC5.6 apply to **Embedded Medium Power Stations** not the subject of a **Bilateral Agreement** or **Embedded DC Converter Stations** not the subject of a **Bilateral Agreement** within its **System** in respect of test failures, re-tests and disputes as to test failures and re-tests;

(b) ensure that the provisions equivalent to OC5.5.4, OC5.5.5 and OC5.6 referred to in OC5.8.4(a) are effective so that **NGET** may require, if it so wishes, the provision to it of any reports or other information equivalent to those or that to which **NGET** would be entitled in relation to test failures, re-tests and disputes as to test failures and re-tests under the provisions of OC5.5.4, OC5.5.5 and OC5.6; and

(c) the provisions equivalent to OC5.5.4, OC5.5.5 and OC5.6 referred to in OC5.8.4(a) are effective to permit **NGET** to conduct itself and take decisions in such a manner in relation to test failures, re-tests and disputes as to test failures and re-tests in respect of **Embedded Medium Power Stations** not the subject of a **Bilateral Agreement** or **Embedded DC Converter Stations** not the subject of a **Bilateral Agreement** as it is able to conduct itself and take decisions in relation to test failures, re-tests and disputes as to test failures and re-tests under OC5.5.4, OC5.5.5 and OC5.6.

<End of OC5>
OPERATING CODE NO.6

DEMAND CONTROL

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OPERATING CODE NO.6

DEMAND CONTROL

OC6.1 INTRODUCTION

OC6.1.1 Operating Code No.6 ("OC6") is concerned with the provisions to be made by Network Operators, and in relation to Non-Embedded Customers by NGET, to permit the reduction of Demand in the event of insufficient Active Power generation being available to meet Demand, or in the event of breakdown or operating problems (such as in respect of System Frequency, System voltage levels or System thermal overloads) on any part of the National Electricity Transmission System.

OC6.1.2 OC6 deals with the following:

(a) Customer voltage reduction initiated by Network Operators (other than following the instruction of NGET);

(b) Customer Demand reduction by Disconnection initiated by Network Operators (other than following the instruction of NGET);

(c) Demand reduction instructed by NGET;

(d) automatic low frequency Demand Disconnection; and

(e) emergency manual Demand Disconnection.

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

OC6.1.3 The procedure set out in OC6 includes a system of warnings to give advance notice of Demand Control that may be required by NGET under this OC6.

OC6.1.4 Data relating to Demand Control should include details relating to MW.

OC6.1.5 The Electricity Supply Emergency Code issued by the Department of Trade and Industry, Energy Utilities Directorate, on 30 November 1999 provides that in certain circumstances consumers are given a certain degree of "protection" when rota disconnections are implemented pursuant to a direction under the Energy Act 1976. No such protection can be given in relation to Demand Control under the Grid Code.

OC6.1.6 Connections between Large Power Stations and the National Electricity Transmission System and between such Power Stations and a User System will not, as far as possible, be disconnected by NGET pursuant to the provisions of OC6 insofar as that would interrupt supplies

(a) for the purposes of operation of the Power Station (including Start-Up and shutting down);

(b) for the purposes of keeping the Power Station in a state such that it could be Started-up when it is off-Load for ordinary operational reasons; or
(c) for the purposes of compliance with the requirements of a Nuclear Site Licence.

Demand Control pursuant to this OC6 therefore applies subject to this exception.

OC6.2 OBJECTIVE

OC6.2.1 The overall objective of OC6 is to require the provision of facilities to enable NGET to achieve reduction in Demand that will either avoid or relieve operating problems on the National Electricity Transmission System, in whole or in part, and thereby to enable NGET to instruct Demand Control in a manner that does not unduly discriminate against, or unduly prefer, any one or any group of Suppliers or Network Operators or Non-Embedded Customers. It is also to ensure that NGET is notified of any Demand Control utilised by Users other than following an instruction from NGET.

OC6.2.2 For certain Grid Supply Points in Scotland it is recognised that it may not be possible to meet the requirements in OC6.4.5(b), OC6.5.3(b) (in respect of Demand Disconnection only), OC6.5.6 (ii), OC6.6.2 (c) and OC6.7.2 (b). In these circumstances NGET and the relevant Network Operator(s) will agree equivalent requirements covering a number of Grid Supply Points. If NGET and the relevant Network Operator fail to agree equivalent requirements covering a number of Grid Supply Points, then the relevant Network Operator will apply the provisions of OC6.4.5(b), OC6.5.3(b) (in respect of Demand Disconnection only), OC6.5.6(ii), OC6.6.2(c) and OC6.7.2(b) as evenly as reasonably practicable over the relevant Network Operator’s entire System.

OC6.3 SCOPE

OC6.3.1 OC6 applies to NGET and to Users which in OC6 means:-

(a) Generators; and

(b) Network Operators.

It also applies to NGET in relation to Non-Embedded Customers.

OC6.3.2 Explanation

OC6.3.2.1 (a) Although OC6 does not apply to Suppliers, the implementation of Demand Control may affect their Customers.

(b) In all situations envisaged in OC6, Demand Control is exercisable:-

(i) by reference to a Network Operator’s System; or

(ii) by NGET in relation to Non-Embedded Customers.

(c) Demand Control in all situations relates to the physical organisation of the Total System, and not to any contractual arrangements that may exist.
OC6.3.2.2 (a) Accordingly, Demand Control will be exercisable with reference to, for example, five per cent (or such other figure as may be utilised under OC6.5) tranches of Demand by a Network Operator.

(b) For a Supplier, whose Customers may be spread throughout a number of User Systems (and the National Electricity Transmission System), to split its Customers into five per cent (or such other figure as may be utilised under OC6.5) tranches of Demand would not result in Demand Control being implemented effectively on the Total System.

(c) Where Demand Control is needed in a particular area, NGET would not know which Supplier to contact and (even if it were to) the resulting Demand Control implemented, because of the diversity of contracts, may well not produce the required result.

OC6.3.2.3 (a) Suppliers should note, however, that, although implementation of Demand Control in respect of their Customers is not exercisable by them, their Customers may be affected by Demand Control.

(b) This will be implemented by Network Operators where the Customers are within User Systems directly connected to the National Electricity Transmission System and by NGET where they are Non-Embedded Customers.

(c) The contractual arrangements relating to Customers being supplied by Suppliers will, accordingly, need to reflect this.

(d) The existence of a commercial arrangement for the provision of Customer Demand Management or Commercial Ancillary Services does not relieve a Network Operator from the Demand Control provisions of OC6.5, OC6.6 and OC6.7, which may be exercised from time to time.

OC6.4 PROCEDURE FOR THE NOTIFICATION OF DEMAND CONTROL INITIATED BY NETWORK OPERATORS (OTHER THAN FOLLOWING THE INSTRUCTION OF NGET)

OC6.4.1 Pursuant to the provisions of OC1, in respect of the time periods prior to 1100 hours each day, each Network Operator will notify NGET of all Customer voltage reductions and/or restorations and Demand Disconnection or reconnection, on a Grid Supply Point and half-hourly basis, which will or may, either alone or when aggregated with any other Demand Control planned by that Network Operator, result in a Demand change equal to or greater than the Demand Control Notification Level averaged over any half hour on any Grid Supply Point, which is planned to be instructed by the Network Operator other than following an instruction from NGET relating to Demand reduction.

OC6.4.2 Under OC6, each Network Operator will notify NGET in writing by 1100 hours each day (or such other time specified by NGET from time to time) for the next day (except that it will be for the next 3 days on Fridays and 2 days on Saturdays and may be longer (as specified by NGET at least one week in advance) to cover holiday periods) of Customer voltage reduction or Demand Disconnection which will or may result in a Demand change equal to or greater than the Demand Control Notification Level averaged over any half hour on any Grid Supply Point,
(or which when aggregated with any other Demand Control planned by that Network Operator is equal to or greater than the Demand Control Notification Level), planned to take place during the next Operational Day.

OC6.4.3 When the Customer voltage reduction or Demand Disconnection which may result in a Demand change equal to or greater than the Demand Control Notification Level averaged over any half hour on any Grid Supply Point (or which when aggregated with any other Demand Control planned or implemented by that Network Operator is equal to or greater than the Demand Control Notification Level) is planned after 1100 hours, each Network Operator must notify NGET as soon as possible after the decision to implement has been made. If the Customer voltage reduction or Demand Disconnection is implemented immediately after the decision to implement is made, each Network Operator must notify NGET within five minutes of implementation.

OC6.4.4 Where, after NGET has been notified, whether pursuant to OC1, OC6.4.2 or OC6.4.3, the planned Customer voltage reduction or Demand Disconnection is changed, the Network Operator will notify NGET as soon as possible of the new plans, or if the Customer voltage reduction or Demand Disconnection implemented is different to that notified, the Network Operator will notify NGET of what took place within five minutes of implementation.

OC6.4.5 Any notification under OC6.4.2, OC6.4.3 or OC6.4.4 will contain the following information on a Grid Supply Point and half hourly basis:

(a) the proposed (in the case of prior notification) and actual (in the case of subsequent notification) date, time and duration of implementation of the Customer voltage reduction or Demand Disconnection; and

(b) the proposed reduction in Demand by use of the Customer voltage reduction or Demand Disconnection.

OC6.4.6 Pursuant to the provisions of OC1.5.6, each Network Operator will supply to NGET details of the amount of Demand reduction actually achieved by use of the Customer voltage reduction or Demand Disconnection.

OC6.5 PROCEDURE FOR THE IMPLEMENTATION OF DEMAND CONTROL ON THE INSTRUCTIONS OF NGET

OC6.5.1 A National Electricity Transmission System Warning - High Risk of Demand Reduction will, where possible, be issued by NGET, as more particularly set out in OC6.5.4, OC7.4.8 and BC1.5.4 when NGET anticipates that it will or may instruct a Network Operator to implement Demand reduction. It will, as provided in OC6.5.10 and OC7.4.8.2, also be issued to Non-Embedded Customers.

OC6.5.2 Where NGET expects to instruct Demand reduction within the following 30 minutes, NGET will where possible, issue a National Electricity Transmission System Warning - Demand Control Imminent in accordance with OC7.4.8.2(c) and OC7.4.8.6.

OC6.5.3 (a) Whether a National Electricity Transmission System Warning - High Risk of Demand Reduction or National Electricity Transmission System Warning - Demand Control Imminent has been issued or not:-
(i) provided the instruction relates to not more than 20 per cent of its total Demand (measured at the time the Demand reduction is required); and

(ii) if less than that, is in four integral multiples of between four and six per cent,

each Network Operator will abide by the instructions of NGET with regard to Demand reduction under OC6.5 without delay.

(b) The Demand reduction must be achieved within the Network Operator's System as far as possible uniformly across all Grid Supply Points (unless otherwise specified in the National Electricity Transmission System Warning - High Risk of Demand Reduction) either by Customer voltage reduction or by Demand Disconnection, as soon as possible but in any event no longer than five minutes from the instruction being given by NGET.

(c) Each Network Operator must notify NGET in writing by calendar week 24 each year of the integral multiples it will use with effect from the succeeding Financial Year onwards. Thereafter, any changes must be notified in writing to NGET at least 10 Business Days prior to the change coming into effect.

OC6.5.4 (a) Where NGET wishes to instruct a Demand reduction of more than 20 per cent of a Network Operator's Demand (measured at the time the Demand reduction is required), it shall, if it is able, issue a National Electricity Transmission System Warning - High Risk of Demand Reduction to the Network Operator by 1600 hours on the previous day. The warning will state the percentage level of Demand reduction that NGET may want to instruct (measured at the time the Demand reduction is required).

(b) The National Electricity Transmission System Warning - High Risk of Demand Reduction will specify the percentage of Demand reduction that NGET may require in integral multiples of the percentage levels notified by Users under OC6.5.3(c) up to (and including) 20 per cent and of five per cent above 20 per cent and will not relate to more than 40 per cent of Demand (measured at the time the Demand reduction is required) of the Demand on the User System of a Network Operator.

(c) If NGET has issued the National Electricity Transmission System Warning - High Risk of Demand Reduction by 1600 hours on the previous day, on receipt of it the relevant Network Operator shall make available the percentage reduction in Demand specified for use within the period of the National Electricity Transmission System Warning.

(d) If NGET has not issued the National Electricity Transmission System Warning - High Risk of Demand Reduction by 1600 hours the previous day, but after that time, the Network Operator shall make available as much of the required Demand reduction as it is able, for use within the period of the National Electricity Transmission System Warning.

OC6.5.5 (a) If NGET has given a National Electricity Transmission System Warning - High Risk of Demand Reduction to a Network Operator, and has issued it by 1600 hours on the previous day, it can instruct the Network Operator
to reduce its Demand by the percentage specified in the National Electricity Transmission System Warning.

(b) NGET accepts that if it has not issued the National Electricity Transmission System Warning - High Risk of Demand Reduction by 1600 hours on the previous day or if it has issued it by 1600 hours on the previous day, but it requires a further percentage of Demand reduction (which may be in excess of 40 per cent of the total Demand on the User System of the Network Operator (measured at the time the Demand reduction is required) from that set out in the National Electricity Transmission System Warning, it can only receive an amount that can be made available at that time by the Network Operator.

(c) Other than with regard to the proviso, the provisions of OC6.5.3 shall apply to those instructions.

OC6.5.6 Once a Demand reduction has been applied by a Network Operator at the instruction of NGET, the Network Operator may interchange the Customers to whom the Demand reduction has been applied provided that,

(i) the percentage of Demand reduction at all times within the Network Operator's System does not change; and

(ii) at all times it is achieved within the Network Operator's System as far as possible uniformly across all Grid Supply Points (unless otherwise specified in the National Electricity Transmission System Warning - High Risk of Demand Reduction if one has been issued),

until NGET instructs that Network Operator in accordance with OC6.

OC6.5.7 Each Network Operator will abide by the instructions of NGET with regard to the restoration of Demand under OC6.5 without delay. It shall not restore Demand until it has received such instruction. The restoration of Demand must be achieved as soon as possible and the process of restoration must begin within 2 minutes of the instruction being given by NGET.

OC6.5.8 In circumstances of protracted shortage of generation or where a statutory instruction has been given (eg. a fuel security period) and when a reduction in Demand is envisaged by NGET to be prolonged, NGET will notify the Network Operator of the expected duration.

OC6.5.9 The Network Operator will notify NGET in writing that it has complied with NGET's instruction under OC6.5, within five minutes of so doing, together with an estimation of the Demand reduction or restoration achieved, as the case may be.

OC6.5.10 NGET may itself implement Demand reduction and subsequent restoration on Non-Embedded Customers as part of a Demand Control requirement and it will organise the National Electricity Transmission System so that it will be able to reduce Demand by Disconnection of, or Customer voltage reduction to, all or any Non-Embedded Customers. Equivalent provisions to those in OC6.5.4 shall apply to issuing a National Electricity Transmission System Warning - High Risk of Demand Reduction to Non-Embedded Customers, as envisaged in OC7.4.8.
OC6.5.11 Pursuant to the provisions of OC1.5.6, the Network Operator will supply to NGET details of the amount of Demand reduction or restoration actually achieved.
OC6.6 AUTOMATIC LOW FREQUENCY DEMAND DISCONNECTION

OC6.6.1 Each **Network Operator** will make arrangements that will enable automatic low Frequency Disconnection of at least:

(i) 60 per cent of its total Demand (based on Annual ACS Conditions) at the time of forecast National Electricity Transmission System peak demand where such **Network Operator's System** is connected to the National Electricity Transmission System in NGET’s Transmission Area

(ii) 40 per cent of its total Demand (based on Annual ACS Conditions) at the time of forecast National Electricity Transmission System peak demand where such **Network Operator’s System** is connected to the National Electricity Transmission System in either SPT’s or SHETL’s Transmission Area

in order to seek to limit the consequences of a major loss of generation or an **Event** on the Total System which leaves part of the Total System with a generation deficit. Where a **Network Operator's System** is connected to the National Electricity Transmission System in more than one Transmission Area, the figure above for the Transmission Area in which the majority of the **Network Operator’s Demand** is connected shall apply.

OC6.6.2 (a) The Demand of each **Network Operator** which is subject to automatic low Frequency Disconnection will be split into discrete MW blocks.

(b) The number, size (% Demand) and the associated low Frequency settings of these blocks, will be as specified in Table CC.A.5.5.1a. NGET will keep the settings under review.

(c) The distribution of the blocks will be such as to give a reasonably uniform Disconnection within the **Network Operator's System**, as the case may be, across all Grid Supply Points.

(d) Each **Network Operator** will notify NGET in writing by calendar week 24 each year of the details of the automatic low Frequency Disconnection on its **User System**. The information provided should identify, for each Grid Supply Point at the date and time of the annual peak of the National Electricity Transmission System Demand at Annual ACS Conditions (as notified pursuant to OC1.4.2), the frequency settings at which Demand Disconnection will be initiated and amount of Demand disconnected at each such setting.

OC6.6.3 Where conditions are such that, following automatic low Frequency Demand Disconnection, and the subsequent Frequency recovery, it is not possible to restore a large proportion of the total Demand so disconnected within a reasonable period of time, NGET may instruct a **Network Operator** to implement additional Demand Disconnection manually, and restore an equivalent amount of the Demand that had been disconnected automatically. The purpose of such action is to ensure that a subsequent fall in Frequency will again be contained by the operation of automatic low Frequency Demand Disconnection.

OC6.6.4 Once an automatic low Frequency Demand Disconnection has taken place, the **Network Operator** on whose **User System** it has occurred, will not reconnect until NGET instructs that **Network Operator** to do so in accordance with OC6.
OC6.6.5 Once the Frequency has recovered, each Network Operator will abide by the instructions of NGET with regard to reconnection under OC6.6 without delay. Reconnection must be achieved as soon as possible and the process of reconnection must begin within 2 minutes of the instruction being given by NGET.

OC6.6.6 (a) Non-Embedded Customers (including a Pumped Storage Generator) must provide automatic low Frequency disconnection, which will be split into discrete blocks.

(b) The number and size of blocks and the associated low Frequency settings will be as specified by NGET by week 24 each calendar year following discussion with the Non-Embedded Customers (including a Pumped Storage Generator) in accordance with the relevant Bilateral Agreement.

OC6.6.7 (a) In addition, Generators may wish to disconnect Generating Units from the System, either manually or automatically, should they be subject to Frequency levels which could result in Generating Unit damage.

(b) This Disconnection facility on such Generating Unit directly connected to the National Electricity Transmission System, will be agreed with NGET in accordance with the Bilateral Agreement.

(c) Any Embedded Power Stations will need to agree this Disconnection facility with the relevant User to whose System that Power Station is connected, which will then need to notify NGET of this.

OC6.6.8 The Network Operator or Non-Embedded Customer, as the case may be, will notify NGET with an estimation of the Demand reduction which has occurred under automatic low Frequency Demand Disconnection and similarly notify the restoration, as the case may be, in each case within five minutes of the Disconnection or restoration.

OC6.6.9 Pursuant to the provisions of OC1.5.6 the Network Operator and Non-Embedded Customer will supply to NGET details of the amount of Demand reduction or restoration actually achieved.

OC6.6.10 (a) In the case of a User, it is not necessary for it to provide automatic low Frequency disconnection under OC6.6 only to the extent that it is providing, at the time it would be so needed, low Frequency disconnection at a higher level of Frequency as an Ancillary Service, namely if the amount provided as an Ancillary Service is less than that required under OC6.6 then the User must provide the balance required under OC6.6 at the time it is so needed.

(b) The provisions of OC7.4.8 relating to the use of Demand Control should be borne in mind by Users.

OC6.7 EMERGENCY MANUAL DISCONNECTION

OC6.7.1 Each Network Operator will make arrangements that will enable it, following an instruction from NGET, to disconnect Customers on its User System under emergency conditions irrespective of Frequency within 30 minutes. It must be
possible to apply the **Demand Disconnections** to individual or specific groups of **Grid Supply Points**, as determined by NGET.

**OC6.7.2**

(a) Each **Network Operator** shall provide NGET in writing by week 24 in each calendar year, in respect of the next following year beginning week 24, on a **Grid Supply Point** basis, with the following information (which is set out in a tabular format in the Appendix):

(i) its total peak **Demand** (based on **Annual ACS Conditions**); and

(ii) the percentage value of the total peak **Demand** that can be disconnected (and in the case of that in the first 5 minutes it must include that which can also be reduced by voltage reduction) within timescales of 5/10/15/20/25/30 minutes.

(b) The information should include, in relation to the first 5 minutes, as a minimum, the 20% of **Demand** that must be reduced on instruction under OC6.5.

**OC6.7.3**

Each **Network Operator** will abide by the instructions of NGET with regard to **Disconnection** under OC6.7 without delay, and the **Disconnection** must be achieved as soon as possible after the instruction being given by NGET, and in any case, within the timescale registered in OC6.7. The instruction may relate to an individual **Grid Supply Point** and/or groups of **Grid Supply Points**.

**OC6.7.4**

NGET will notify a **Network Operator** who has been instructed under OC6.7, of what has happened on the **National Electricity Transmission System** to necessitate the instruction, in accordance with the provisions of OC7 and, if relevant, OC10.

**OC6.7.5**

Once a **Disconnection** has been applied by a **Network Operator** at the instruction of NGET, that **Network Operator** will not reconnect until NGET instructs it to do so in accordance with OC6.

**OC6.7.6**

Each **Network Operator** will abide by the instructions of NGET with regard to reconnection under OC6.7 without delay, and shall not reconnect until it has received such instruction and reconnection must be achieved as soon as possible and the process of reconnection must begin within 2 minutes of the instruction being given by NGET.

**OC6.7.7**

NGET may itself disconnect manually and reconnect **Non-Embedded Customers** as part of a **Demand Control** requirement under emergency conditions.

**OC6.7.8**

If NGET determines that emergency manual **Disconnection** referred to in OC6.7 is inadequate, NGET may disconnect **Network Operators** and/or **Non-Embedded Customers** at **Grid Supply Points**, to preserve the security of the **National Electricity Transmission System**.

**OC6.7.9**

Pursuant to the provisions of OC1.5.6 the **Network Operator** will supply to NGET details of the amount of **Demand** reduction or restoration actually achieved.
Demand Control will constitute an Emergency Instruction 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. NGET will inform affected BM Participants in accordance with the provisions of OC7.
EMERGENCY MANUAL DEMAND REDUCTION/DISCONNECTION SUMMARY SHEET
(As set out in OC6.7)

NETWORK OPERATOR _________________ [YEAR] PEAK:_________________________

<table>
<thead>
<tr>
<th>GRID SUPPLY POINT (Name)</th>
<th>PEAK MW</th>
<th>% OF GROUP DEMAND DISCONNECTION (AND/OR REDUCTION IN THE CASE OF THE FIRST 5 MINUTES) (CUMULATIVE)</th>
<th>TIME (MINS)</th>
<th>REMARKS</th>
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<td></td>
<td></td>
<td>5</td>
<td>10</td>
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Notes: 1. Data to be provided annually by week 24 to cover the following year.

< End of OC6 >
## OPERATING CODE NO.7

### OPERATIONAL LIAISON

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OPERATING CODE NO.7

OPERATIONAL LIAISON

OC7.1 INTRODUCTION

OC7.1.1 Operating Code No. 7 ("OC7") sets out the requirements for the exchange of information in relation to Operations and/or Events on the Total System which have had (or may have had) or will have (or may have) an Operational Effect:

(a) on the National Electricity Transmission System in the case of an Operation and/or Event occurring on the System of a User or Users; and

(b) on the System of a User or Users in the case of an Operation and/or Event occurring on the National Electricity Transmission System.

It also describes the types of National Electricity Transmission System Warning which may be issued by NGET.

OC7.1.2 The requirement to notify in OC7 relates generally to notifying of what is expected to happen or what has happened and not the reasons why. However, as OC7 provides, when an Event or Operation has occurred on the National Electricity Transmission System which itself has been caused by (or exacerbated by) an Operation or Event on a User's System, NGET in reporting the Event or Operation on the National Electricity Transmission System to another User can pass on what it has been told by the first User in relation to the Operation or Event on the first User's System.

OC7.1.3 Where an Event or Operation on the National Electricity Transmission System falls to be reported by NGET to an Externally Interconnected System Operator under an Interconnection Agreement, OC7 provides that in the situation where that Event or Operation has been caused by (or exacerbated by) an Operation or Event on a User's System, NGET can pass on what it has been told by the User in relation to the Operation or Event on that User's System.

OC7.1.4 OC7 also deals with Integral Equipment Tests.

OC7.1.5 To reconfigure the National Electricity Transmission System, NGET may reasonably require the assistance of a User to reconfigure parts of the User System. To reconfigure its User System a User may reasonably require the reasonable assistance of NGET to direct the reconfiguration of parts of the National Electricity Transmission System.

OC7.1.6 OC7.6 sets down the arrangements for the exchange of information required when configuring Connection Sites and parts of the National Electricity Transmission System adjacent to those Connection Sites in Scotland and Offshore. It also covers the setting up of a Local Switching Procedure. NGET shall procure that Relevant Transmission Licensees shall comply with section OC7.6 and any relevant Local Switching Procedure where and to the extent that such matters apply to them.

OC7.2 OBJECTIVE
The objectives of OC7 are:-

OC7.2.1 To provide for the exchange of information so that the implications of an Operation and/or Event can be considered, possible risks arising from it can be assessed and appropriate action taken by the relevant party in order to maintain the integrity of the Total System. OC7 does not seek to deal with any actions arising from the exchange of information, but merely with that exchange.

OC7.2.2 To provide for types of National Electricity Transmission System Warnings which may be issued by NGET.

OC7.2.3 To provide the framework for the information flow and discussion between NGET and certain Users in relation to Integral Equipment Tests.

OC7.2.4 To provide the procedure to be followed in respect of Operational Switching in Scotland and Offshore.

OC7.3 SCOPE

OC7.3.1 OC7 applies to NGET and to Users, which in OC7 means:-

(a) Generators (other than those which only have Embedded Small Power Stations or Embedded Medium Power Stations);

(b) Network Operators;

(c) Non-Embedded Customers;

(d) Suppliers (for the purposes of National Electricity Transmission System Warnings);

(e) Externally Interconnected System Operators (for the purposes of National Electricity Transmission System Warnings); and

(f) DC Converter Station owners.

The procedure for operational liaison by NGET with Externally Interconnected System Operators is set out in the Interconnection Agreement with each Externally Interconnected System Operator.

In Scotland and Offshore OC7.6 also applies to Relevant Transmission Licensees.

OC7.4 PROCEDURE

OC7.4.1 The term "Operation" means a scheduled or planned action relating to the operation of a System (including an Embedded Power Station).

OC7.4.2 The term "Event" means an unscheduled or unplanned (although it may be anticipated) occurrence on, or relating to, a System (including an Embedded Power Station) including, without limiting that general description, faults, incidents and breakdowns and adverse weather conditions being experienced.
The term "Operational Effect" means any effect on the operation of the relevant other System which causes the National Electricity Transmission System or the Systems 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 normally operated in the absence of that effect.

References in this OC7 to a System of a User or User's System shall not include Embedded Small Power Stations or Embedded Medium Power Stations, unless otherwise stated.

Requirement to notify Operations

Operation on the National Electricity Transmission System

In the case of an Operation on the National Electricity Transmission System, which will have (or may have) an Operational Effect on the System(s) of a User or Users, NGET will notify the User or Users whose System(s) will, or may, in the reasonable opinion of NGET, be affected, in accordance with OC7.

Operation on a User's System

In the case of an Operation on the System of a User which will have (or may have) an Operational Effect on the National Electricity Transmission System (including an equivalent to an Operation on the equivalent of a System of a User or other person connected to that User's System which, via that User System, will or may have an Operational Effect on the National Electricity Transmission System), the User will notify NGET in accordance with OC7. Following notification by the User, NGET will notify any other User or Users on whose System(s) the Operation will have, or may have, in the reasonable opinion of NGET, an Operational Effect, in accordance with OC7 and will notify any Externally Interconnected System Operator on whose System the Operation will have, or may have, in the reasonable opinion of NGET, an Operational Effect, if it is required to do so by the relevant Interconnection Agreement.

Examples of situations where notification by NGET or a User may be required

Whilst in no way limiting the general requirement to notify in advance set out in OC7.4.5.1 and OC7.4.5.2, the following are examples of situations where notification in accordance with OC7.4.5 will be required if they will, or may, have an Operational Effect:

(a) the implementation of a planned outage of Plant and/or Apparatus which has been arranged pursuant to OC2;

(b) the operation (other than, in the case of a User, at the instruction of NGET) of any circuit breaker or isolator/disconnector or any sequence or combination of the two; or

(c) voltage control.

Operations caused by another Operation or by an Event
An Operation may be caused by another Operation or an Event on another's System (including an Embedded Power Station) (or by the equivalent of an Event or Operation on the System of an Externally Interconnected System Operator or Interconnector User) and in that situation the information to be notified is different to that where the Operation arose independently of any other Operation or Event, as more particularly provided in OC7.4.5.6.

OC7.4.5.5 Form

A notification and any response to any questions asked under OC7.4.5, of an Operation which has arisen independently of any other Operation or of an Event, shall be of sufficient detail to describe the Operation (although it need not state the cause) and to enable the recipient of the notification reasonably to consider and assess the implications and risks arising (provided that, in the case of an Operation on a User's System which NGET is notifying to other Users under OC7.4.5.2, NGET will only pass on what it has been told by the User which has notified it) and will include the name of the individual reporting the Operation on behalf of NGET or the User, as the case may be. The recipient may ask questions to clarify the notification and the giver of the notification will, insofar as it is able, answer any questions raised, provided that, in the case of an Operation on a User's System which NGET is notifying to other Users under OC7.4.5.2, in answering any question, NGET will not pass on anything further than that which it has been told by the User which has notified it. NGET may pass on the information contained in the notification as provided in OC7.4.5.6.

OC7.4.5.6 (a) A notification by NGET of an Operation under OC7.4.5.1 which has been caused by another Operation (the "first Operation") or by an Event on a User's System, will describe the Operation and will contain the information which NGET has been given in relation to the first Operation or that Event by the User. The notification and any response to any questions asked (other than in relation to the information which NGET is merely passing on from a User) will be of sufficient detail to enable the recipient of the notification reasonably to consider and assess the implications and risks arising from the Operation on the National Electricity Transmission System and will include the name of the individual reporting the Operation on behalf of NGET. The recipient may ask questions to clarify the notification and NGET will, insofar as it is able, answer any questions raised, provided that in relation to the information which NGET is merely passing on from a User, in answering any question NGET will not pass on anything further than that which it has been told by the User which has notified it.

(b) Where a User is reporting an Operation or an Event which itself has been caused by an incident or scheduled or planned action affecting (but not on) its System, the notification to NGET will contain the information which the User has been given by the person connected to its System in relation to that incident or scheduled or planned action (which the User must require, contractually or otherwise, the person connected to its System to give to it) and NGET may pass on the information contained in the notification as provided in this OC7.4.5.6.

OC7.4.5.7 Where an Operation on the National Electricity Transmission System falls to be reported by NGET under an Interconnection Agreement and the Operation has been caused by another Operation (the "first Operation") or by an Event on a
User’s System, NGET will include in that report the information which NGET has been given in relation to the first Operation or that Event by the User (including any information relating to an incident or scheduled or planned action, as provided in OC7.4.5.6).

OC7.4.5.8

(a) A notification to a User by NGET of an Operation under OC7.4.5.1 which has been caused by the equivalent of an Operation or of an Event on the equivalent of a System of an Externally Interconnected System Operator or Interconnector User, will describe the Operation on the National Electricity Transmission System and will contain the information which NGET has been given, in relation to the equivalent of an Operation or of an Event on the equivalent of a System of an Externally Interconnected System Operator or Interconnector User, by that Externally Interconnected System Operator or Interconnector User.

(b) The notification and any response to any question asked (other than in relation to the information which NGET is merely passing on from that Externally Interconnected System Operator or Interconnector User) will be of sufficient detail to enable the recipient of the notification reasonably to consider and assess the implications and risks arising from the Operation on the National Electricity Transmission System and will include the name of the individual reporting the Operation on behalf of NGET. The recipient may ask questions to clarify the notification and NGET will, insofar as it is able, answer any questions raised, provided that, in relation to the information which NGET is merely passing on from an Externally Interconnected System Operator or Interconnector User, in answering any question NGET will not pass on anything further than that which it has been told by the Externally Interconnected System Operator or Interconnector User which has notified it.

OC7.4.5.9

(a) A Network Operator may pass on the information contained in a notification to it from NGET under OC7.4.5.1, to a Generator with a Generating Unit or a Power Park Module connected to its System, or to a DC Converter Station owner with a DC Converter connected to its System, or to the operator of another User System connected to its System (which, for the avoidance of doubt, could be another Network Operator), in connection with reporting the equivalent of an Operation under the Distribution Code (or the contract pursuant to which that Generating Unit or Power Park Module or other User System, or to a DC Converter Station is connected to the System of that Network Operator) (if the Operation on the National Electricity Transmission System caused it).

(b) A Generator may pass on the information contained in a notification to it from NGET under OC7.4.5.1, to another Generator with a Generating Unit or a Power Park Module connected to its System, or to the operator of a User System connected to its System (which, for the avoidance of doubt, could be a Network Operator), if it is required (by a contract pursuant to which that Generating Unit or that Power Park Module or that User System is connected to its System) to do so in connection with the equivalent of an Operation on its System (if the Operation on the National Electricity Transmission System caused it).
OC7.4.5.10 (a) Other than as provided in OC7.4.5.9, a **Network Operator** or a **Generator** may not pass on any information contained in a notification to it from **NGET** under OC7.4.5.1 (and an operator of a **User System** or **Generator** receiving information which was contained in a notification to a **Generator** or a **Network Operator**, as the case may be, from **NGET** under OC7.4.5.1, as envisaged in OC7.4.5.9 may not pass on this information) to any other person, but may inform persons connected to its **System** (or in the case of a **Generator** which is also a **Supplier**, inform persons to which it supplies electricity which may be affected) that there has been an incident on the **Total System**, the general nature of the incident (but not the cause of the incident) and (if known and if power supplies have been affected) an estimated time of return to service.

(b) In the case of a **Generator** which has an **Affiliate** which is a **Supplier**, the **Generator** may inform it that there has been an incident on the **Total System**, the general nature of the incident (but not the cause of the incident) and (if known and if power supplies have been affected in a particular area) an estimated time of return to service in that area, and that **Supplier** may pass this on to persons to which it supplies electricity which may be affected).

(c) Each **Network Operator** and **Generator** shall use its reasonable endeavours to procure that any **Generator** or operator of a **User System** receiving information which was contained in a notification to a **Generator** or **Network Operator**, as the case may be, from **NGET** under OC7.4.5.1, which is not bound by the **Grid Code**, does not pass on any information other than as provided above.

OC7.4.5.11 The notification will, if either party requests, be recorded by the sender and dictated to the recipient, who shall record and repeat each phrase as it is received and on completion of the dictation shall repeat back the notification in full to the sender who shall confirm that it has been accurately recorded.

OC7.4.5.12 **Timing**

A notification under OC7.4.5 will be given as far in advance as possible and in any event shall be given in sufficient time as will reasonably allow the recipient to consider and assess the implications and risks arising.

OC7.4.6 **Requirements to notify Events**

OC7.4.6.1 **Events on the National Electricity Transmission System**

In the case of an **Event** on the **National Electricity Transmission System** which has had (or may have had) an **Operational Effect** on the **System(s)** of a **User** or **Users**, **NGET** will notify the **User** or **Users** whose **System(s)** have been, or may have been, in the reasonable opinion of **NGET**, affected, in accordance with **OC7**.

OC7.4.6.2 **Events on a User's System**
In the case of an Event on the System of a User which has had (or may have had) an Operational Effect on the National Electricity Transmission System, the User will notify NGET in accordance with OC7.

**OC7.4.6.3 Events caused by another Event or by an Operation**

An Event may be caused (or exacerbated by) another Event or by an Operation on another's System (including on an Embedded Power Station) (or by the equivalent of an Event or Operation on the equivalent of a System of an Externally Interconnected System Operator or Interconnector User) and in that situation the information to be notified is different to that where the Event arose independently of any other Event or Operation, as more particularly provided in OC7.4.6.7.

**OC7.4.6.4 NGET or a User, as the case may be, may enquire of the other whether an Event has occurred on the other's System.** If it has, and the party on whose System the Event has occurred is of the opinion that it may have had an Operational Effect on the System of the party making the enquiry, it shall notify the enquirer in accordance with OC7.

**OC7.4.6.5 Examples of situations where notification by NGET or a User may be required**

Whilst in no way limiting the general requirement to notify set out in OC7.4.6.1, OC7.4.6.2 and OC7.4.6.3, the following are examples of situations where notification in accordance with OC7.4.6 will be required if they have an Operational Effect:

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

(b) the activation of any alarm or indication of any abnormal operating condition;

(c) adverse weather conditions being experienced;

(d) breakdown of, or faults on, or temporary changes in the capabilities of, Plant and/or Apparatus;

(e) breakdown of, or faults on, control, communication and metering equipment; or

(f) increased risk of inadvertent protection operation.

**Form**

**OC7.4.6.6** A notification and any response to any questions asked under OC7.4.6.1 and OC7.4.6.2 of an Event which has arisen independently of any other Event or of an Operation, will describe the Event, although it need not state the cause of the Event, and, subject to that, will be of sufficient detail to enable the recipient of the notification reasonably to consider and assess the implications and risks arising and will include the name of the individual reporting the Event on behalf of NGET or the User, as the case may be. The recipient may ask questions to clarify the notification and the giver of the notification will, insofar as it is able (although it need not state the cause of the Event) answer any questions raised. NGET may pass on the information contained in the notification as provided in OC7.4.6.7.
OC7.4.6.7 (a) A notification (and any response to any questions asked under OC7.4.6.1) by NGET of (or relating to) an Event under OC7.4.6.1 which has been caused by (or exacerbated by) another Event (the "first Event") or by an Operation on a User’s System will describe the Event and will contain the information which NGET has been given in relation to the first Event or that Operation by the User (but otherwise need not state the cause of the Event). The notification and any response to any questions asked (other than in relation to the information which NGET is merely passing on from a User) will be of sufficient detail to enable the recipient of the notification reasonably to consider and assess the implications and risks arising from the Event on the National Electricity Transmission System and will include the name of the individual reporting the Event on behalf of NGET. The recipient may ask questions to clarify the notification and NGET will, insofar as it is able, answer any questions raised, provided that in relation to the information which NGET is merely passing on from a User, in answering any question NGET will not pass on anything further than that which it has been told by the User which has notified it.

(b) Where a User is reporting an Event or an Operation which itself has been caused by (or exacerbated by) an incident or scheduled or planned action affecting (but not on) its System the notification to NGET will contain the information which the User has been given by the person connected to its System in relation to that incident or scheduled or planned action (which the User must require, contractually or otherwise, the person connected to its System to give to it) and NGET may pass on the information contained in the notification as provided in this OC7.4.6.7.

OC7.4.6.8 Where an Event on the National Electricity Transmission System fails to be reported by NGET under an Interconnection Agreement and the Event has been caused by (or exacerbated by) another Event (the "first Event") or by an Operation on a User’s System, NGET will include in that report the information which NGET has been given in relation to the first Event or that Operation by the User (including any information relating to an incident or scheduled or planned action on that User’s System, as provided in OC7.4.6.7).

OC7.4.6.9 (a) A notification to a User (and any response to any questions asked under OC7.4.6.1) by NGET of (or relating to) an Event under OC7.4.6.1 which has been caused by (or exacerbated by) the equivalent of an Event or of an Operation on the equivalent of a System of an Externally Interconnected System Operator or Interconnector User, will describe the Event on the National Electricity Transmission System and will contain the information which NGET has been given, in relation to the equivalent of an Event or of an Operation on the equivalent of a System of an Externally Interconnected System Operator or Interconnector User, by that Externally Interconnected System Operator or Interconnector User (but otherwise need not state the cause of the Event).

(b) The notification and any response to any questions asked (other than in relation to the information which NGET is merely passing on from that Externally Interconnected System Operator or Interconnector User) will be of sufficient detail to enable the recipient of the notification reasonably to consider and assess the implications and risks arising from the Event on the
National Electricity Transmission System and will include the name of the individual reporting the Event on behalf of NGET. The recipient may ask questions to clarify the notification and NGET will, insofar as it is able (although it need not state the cause of the Event) answer any questions raised, provided that, in relation to the information which NGET is merely passing on from an Externally Interconnected System Operator or Interconnector User, in answering any question NGET will not pass on anything further than that which it has been told by the Externally Interconnected System Operator or Interconnector User which has notified it.

OC7.4.6.10 (a) A Network Operator may pass on the information contained in a notification to it from NGET under OC7.4.6.1, to a Generator with a Generating Unit or a Power Park Module connected to its System or to a DC Converter Station owner with a DC Converter connected to its System or to the operator of another User System connected to its System (which, for the avoidance of doubt, could be a Network Operator), in connection with reporting the equivalent of an Event under the Distribution Code (or the contract pursuant to which that Generating Unit or Power Park Module or DC Converter or other User System is connected to the System of that Network Operator) (if the Event on the National Electricity Transmission System caused or exacerbated it).

(b) A Generator may pass on the information contained in a notification to it from NGET under OC7.4.6.1, to another Generator with a Generating Unit or a Power Park Module connected to its System or to the operator of a User System connected to its System (which, for the avoidance of doubt, could be a Network Operator), if it is required (by a contract pursuant to which that Generating Unit or that Power Park Module or that User System is connected to its System) to do so in connection with the equivalent of an Event on its System (if the Event on the National Electricity Transmission System caused or exacerbated it).

OC7.4.6.11 (a) Other than as provided in OC7.4.6.10, a Network Operator or a Generator, may not pass on any information contained in a notification to it from NGET under OC7.4.6.1 (and an operator of a User System or Generator receiving information which was contained in a notification to a Generator or a Network Operator, as the case may be, from NGET under OC7.4.6.1, as envisaged in OC7.4.6.10 may not pass on this information) to any other person, but may inform persons connected to its System (or in the case of a Generator which is also a Supplier, inform persons to which it supplies electricity which may be affected) that there has been an incident on the Total System, the general nature of the incident (but not the cause of the incident) and (if known and if power supplies have been affected) an estimated time of return to service.

(b) In the case of a Generator which has an Affiliate which is a Supplier, the Generator may inform it that there has been an incident on the Total System, the general nature of the incident (but not the cause of the incident) and (if known and if power supplies have been affected in a particular area) an estimated time of return to service in that area, and that Supplier may pass this on to persons to which it supplies electricity which may be affected).
(c) Each Network Operator and Generator shall use its reasonable endeavours to procure that any Generator or operator of a User System receiving information which was contained in a notification to a Generator or Network Operator, as the case may be, from NGET under OC7.4.6.1, which is not bound by the Grid Code, does not pass on any information other than as provided above.

OC7.4.6.12 When an Event relating to a Generating Unit, Power Park Module or DC Converter, has been reported to NGET by a Generator or DC Converter Station owner under OC7.4.6 and it is necessary in order for the Generator or DC Converter Station owner to assess the implications of the Event on its System more accurately, the Generator or DC Converter Station owner may ask NGET for details of the fault levels from the National Electricity Transmission System to that Generating Unit, Power Park Module or DC Converter at the time of the Event, and NGET will, as soon as reasonably practicable, give the Generator or DC Converter Station owner that information provided that NGET has that information.

OC7.4.6.13 Except in an emergency situation the notification of an Event will, if either party requests, be recorded by the sender and dictated to the recipient, who shall record and repeat each phrase as it is received and on completion of the dictation shall repeat the notification in full to the sender who shall confirm that it has been accurately recorded.

Timing

OC7.4.6.14 A notification under OC7.4.6 shall be given as soon as possible after the occurrence of the Event, or time that the Event is known of or anticipated by the giver of the notification under OC7, and in any event within 15 minutes of such time.

OC7.4.7 Significant Incidents

OC7.4.7.1 Where a User notifies NGET of an Event under OC7 which NGET considers has had or may have had a significant effect on the National Electricity Transmission System, NGET will require the User to report that Event in writing in accordance with the provisions of OC10 and will notify that User accordingly.

OC7.4.7.2 Where NGET notifies a User of an Event under OC7 which the User considers has had or may have had a significant effect on that User's System, that User will require NGET to report that Event in writing in accordance with the provisions of OC10 and will notify NGET accordingly.

OC7.4.7.3 Events which NGET requires a User to report in writing pursuant to OC7.4.7.1, and Events which a User requires NGET to report in writing pursuant to OC7.4.7.2, are known as "Significant Incidents".

OC7.4.7.4 Without limiting the general description set out in OC7.4.7.1 and OC7.4.7.2, a Significant Incident will include Events having an Operational Effect which result in, or may result in, the following:
(a) operation of Plant and/or Apparatus either manually or automatically;
(b) voltage outside statutory limits;
(c) Frequency outside statutory limits; or
(d) System instability.

OC 7.4.8 NATIONAL ELECTRICITY TRANSMISSION SYSTEM WARNINGS

OC7.4.8.1 Role of National Electricity Transmission System Warnings

National Electricity Transmission System Warnings as described below provide information relating to System conditions or Events and are intended to:

(i) alert Users to possible or actual Plant shortage, System problems and/or Demand reductions;
(ii) inform of the applicable period;
(iii) indicate intended consequences for Users; and
(iv) enable specified Users to be in a state of readiness to react properly to instructions received from NGET.

A table of National Electricity Transmission System Warnings, set out in the Appendix to OC7, summarises the warnings and their usage. In the case of a conflict between the table and the provisions of the written text of OC7, the written text will prevail.

OC7.4.8.2 Recipients of National Electricity Transmission System Warnings

(a) Where National Electricity Transmission System Warnings (except those relating to Demand Control Imminent), are applicable to System conditions or Events which have widespread effect, NGET will notify all Users under OC7.

(b) Where in NGET's judgement System conditions or Events may only have a limited effect, the National Electricity Transmission System Warning will only be issued to those Users who are or may in NGET's judgement be affected.

(c) Where a National Electricity Transmission System Warning - Demand Control Imminent is issued it will only be sent to those Users who are likely to receive Demand Control instructions from NGET.

OC7.4.8.3 Preparatory Action

(a) Where possible, and if required, recipients of the warnings should take such preparatory action as they deem necessary taking into account the information contained in the National Electricity Transmission System Warning. All warnings will be of a form determined by NGET and will remain
in force from the stated time of commencement until the cancellation, amendment or re-issue, as the case may be, is notified by NGET.

(b) Where a National Electricity Transmission System Warning has been issued to a Network Operator and is current, Demand Control should not (subject as provided below) be employed unless instructed by NGET. If Demand Control is, however, necessary to preserve the integrity of the Network Operator’s System, then the impact upon the integrity of the Total System should be considered by the Network Operator and where practicable discussed with NGET prior to its implementation.

Where a National Electricity Transmission System Warning has been issued to a Supplier, further Customer Demand Management (in addition to that previously notified under OC1 - Demand Forecasts) must only be implemented following notification to NGET.

(c) National Electricity Transmission System Warnings will be issued by fax, to the facsimile number(s) and locations agreed between NGET and Users, or by such electronic data transmission facilities as have been agreed. In the case of Generators with Gensets this will normally be at their Trading Points (if they have notified NGET that they have a Trading Point).

(d) Users may at times be informed by telephone or other means of National Electricity Transmission System Warnings and in these circumstances confirmation will be sent to those Users so notified, by fax as soon as possible.

OC7.4.8.4 Types of National Electricity Transmission System Warnings

National Electricity Transmission System Warnings consist of the following types:-

(i) National Electricity Transmission System Warning - Inadequate System Margin
(ii) National Electricity Transmission System Warning - High Risk of Demand Reduction
(iii) National Electricity Transmission System Warning - Demand Control Imminent
(iv) National Electricity Transmission System Warning - Risk of System Disturbance

OC7.4.8.5 National Electricity Transmission System Warning - Inadequate System Margin

A National Electricity Transmission System Warning - Inadequate System Margin may be issued to Users in accordance with OC7.4.8.2, at times when there is inadequate System Margin, as determined under BC1.5.4. It will contain the following information:

(i) the period for which the warning is applicable; and
(ii) the availability shortfall in MW; and

(iii) intended consequences for Users, including notification that Maximum Generation Service may be instructed.

OC 7.4.8.6 National Electricity Transmission System Warning - High Risk of Demand Reduction

(a) A National Electricity Transmission System Warning - High Risk of Demand Reduction may be issued to Users in accordance with OC7.4.8.2 at times when there is inadequate System Margin, as determined under BC1.5.4 and in NGET’s judgement there is increased risk of Demand reduction being implemented under OC6.5.1. It will contain the following information in addition to the required information in a National Electricity Transmission System Warning - Inadequate System Margin:

(i) the possible percentage level of Demand reduction required; and

(ii) Specify those Network Operators and Non Embedded Customers who may subsequently receive instructions under OC6.5.1.

(b) A National Electricity Transmission System Warning - High Risk of Demand Reduction may also be issued by NGET to those Network Operators and Non Embedded Customers who may subsequently receive instructions under OC6.5.1 relating to a Demand reduction in circumstances not related to inadequate System Margin (for example Demand reduction required to manage System overloading).

The National Electricity Transmission System Warning - High Risk of Demand Reduction will specify the period during which Demand reduction may be required and the part of the Total System to which it applies and any other matters specified in OC6.5.

OC7.4.8.6.1 Protracted Periods of Generation Shortage

(a) Whenever NGET anticipates that a protracted period of generation shortage may exist a National Electricity Transmission System Warning - Inadequate System Margin or High Risk of Demand Reduction may be issued, to give as much notice as possible to those Network Operators and Non Embedded Customers who may subsequently receive instructions under OC6.5.

(b) A National Electricity Transmission System Warning - High Risk of Demand Reduction will in these instances include an estimate of the percentage of Demand reduction that may be required and the anticipated duration of the Demand reduction. It may also include information relating to estimates of any further percentage of Demand reduction that may be required.

(c) The issue of the National Electricity Transmission System Warning - Inadequate System Margin or High Risk of Demand Reduction is
intended to enable recipients to plan ahead on the various aspects of Demand reduction.

OC7.4.8.7 National Electricity Transmission System Warning - Demand Control Imminent

(a) A National Electricity Transmission System Warning - Demand Control Imminent, relating to a Demand reduction under OC6.5, will be issued by NGET to Users in accordance with OC7.4.8.2. It will specify those Network Operators who may subsequently receive instructions under OC6.5.

(b) A National Electricity Transmission System Warning - Demand Control Imminent, need not be preceded by any other National Electricity Transmission System Warning and will be issued when a Demand reduction is expected within the following 30 minutes, but will not cease to have effect after 30 minutes from its issue. However, NGET will either reissue the National Electricity Transmission System Warning - Demand Control Imminent or cancel the National Electricity Transmission System Warning - Demand Control Imminent no later than 2 hours from first issue, or from re-issue, as the case may be.

OC7.4.8.8 National Electricity Transmission System Warning - Risk of System Disturbance

(a) A National Electricity Transmission System Warning - Risk of System Disturbance will be issued by NGET to Users who may be affected when NGET knows there is a risk of widespread and serious disturbance to the whole or part of, the National Electricity Transmission System;

(b) The National Electricity Transmission System Warning - Risk of System Disturbance will contain such information as NGET deems appropriate;

(c) for the duration of the National Electricity Transmission System Warning - Risk of System Disturbance, each User in receipt of the National Electricity Transmission System Warning - Risk of System Disturbance shall take the necessary steps to warn its operational staff and to maintain its Plant and/or Apparatus in the condition in which it is best able to withstand the anticipated disturbance;

(d) During the period that the National Electricity Transmission System Warning - Risk of System Disturbance is in effect, NGET may issue Emergency Instructions in accordance with BC2 and it may be necessary to depart from normal Balancing Mechanism operation in accordance with BC2 in issuing Bid-Offer Acceptances.

OC7.4.8.9 Cancellation of National Electricity Transmission System Warning

(a) NGET will give notification of a Cancellation of National Electricity Transmission System Warning to all Users issued with the National
Electricity Transmission System Warning when in NGET's judgement System conditions have returned to normal.

(b) A Cancellation of National Electricity Transmission System Warning will identify the type of National Electricity Transmission System Warning being cancelled and the period for which it was issued. The Cancellation of National Electricity Transmission System Warning will also identify any National Electricity Transmission System Warnings that are still in force.

**OC7.4.8.10 General Management of National Electricity Transmission System Warnings**

(a) National Electricity Transmission System Warnings remain in force for the period specified unless superseded or cancelled by NGET.

(b) A National Electricity Transmission System Warning issued for a particular period may be superseded by further related warnings. This will include National Electricity Transmission System Warning - Inadequate System Margin being superseded by National Electricity Transmission System Warning - High Risk of Demand Reduction and vice-versa.

(c) In circumstances where it is necessary for the period of a National Electricity Transmission System Warning to be changed:

(i) the period applicable may be extended by the issue of a National Electricity Transmission System Warning with a period which follows on from the original period, or

(ii) revised or updated National Electricity Transmission System Warnings will be issued where there is an overlap with the period specified in an existing National Electricity Transmission System Warning, but only if the revised period also includes the full period of the existing National Electricity Transmission System Warning.

In any other case the existing National Electricity Transmission System Warning will be cancelled and a new one issued.

(d) A National Electricity Transmission System Warning is no longer applicable once the period has passed and to confirm this NGET will issue a Cancellation of National Electricity Transmission System Warning.

**OC7.5 PROCEDURE IN RELATION TO INTEGRAL EQUIPMENT TESTS**

**OC7.5.1** This section of the Grid Code deals with Integral Equipment Tests. It is designed to provide a framework for the exchange of relevant information and for discussion between NGET and certain Users in relation to Integral Equipment Tests.

**OC7.5.2** An Integral Equipment Test :-
(a) is carried out in accordance with the provisions of this OC7.5 at:-

i) a **User Site**, 

ii) a **Transmission Site**, 

iii) an **Embedded Large Power Station**, or, 

iv) an **Embedded DC Converter Station**;

(b) will normally be undertaken during commissioning or re-commissioning of **Plant** and/or **Apparatus**;

(c) may, in the reasonable judgement of the person wishing to perform the test, cause, or have the potential to cause, an **Operational Effect** on a part or parts of the **Total System** but which with prior notice is unlikely to have a materially adverse effect on any part of the **Total System**; and

(d) may form part of an agreed programme of work.

OC7.5.3 A set of guidance notes is available from **NGET** on request, which provide further details on suggested procedures, information flows and responsibilities.

**Notification of an IET**

OC7.5.4 In order to undertake an **Integral Equipment Test** (and subject to OC7.5.8 below), the **User** or **NGET**, as the case may be, (the proposer) must notify the other (the recipient) of a proposed **IET**. Reasonable advance notification must be given, taking into account the nature of the test and the circumstances which make the test necessary. This will allow recipients time to adequately assess the impact of the **IET** on their **System**.

OC7.5.5 The notification of the **IET** must normally include the following information:-

a) the proposed date and time of the **IET**;

b) the name of the individual and the organisation proposing the **IET**;

c) a proposed programme of testing; and

d) such further detail as the proposer reasonably believes the recipient needs in order to assess the effect the **IET** may have on relevant **Plant** and/or **Apparatus**.

OC7.5.6 In the case of an **IET** in connection with commissioning or re-commissioning, the test should be incorporated as part of any overall commissioning programme agreed between **NGET** and the **User**.

**Response to notification of an IET**

OC7.5.7 The recipient of notification of an **IET** must respond within a reasonable timescale prior to the start time of the **IET** and will not unreasonably withhold or delay acceptance of the **IET** proposal.

OC7.5.8 (a) Where **NGET** receives notification of a proposed **IET** from a **User**, **NGET** will consult those other **Users** whom it reasonably believes may be
affected by the proposed IET to seek their views. Information relating to the proposed IET may be passed on by NGET with the prior agreement of the proposer. However it is not necessary for NGET to obtain the agreement of any such User as IETs should not involve the application of irregular, unusual or extreme conditions. NGET may however consider any comments received when deciding whether or not to agree to an IET.

(b) In the case of an Embedded Large Power Station or Embedded DC Converter Station, the Generator or DC Converter Station owner as the case may be must liaise with both NGET and the relevant Network Operator. NGET will not agree to an IET relating to such Plant until the Generator or DC Converter Station owner has shown that it has the agreement of the relevant Network Operator.

(c) A Network Operator will liaise with NGET as necessary in those instances where it is aware of an Embedded Small Power Station or an Embedded Medium Power Station which intends to perform tests which in the reasonable judgement of the Network Operator may cause an Operational Effect on the National Electricity Transmission System.

OC7.5.9 The response from the recipient, following notification of an IET must be one of the following:-

a) to accept the IET proposal;

b) to accept the IET proposal conditionally subject to minor modifications such as date and time;

c) not to agree the IET, but to suggest alterations to the detail and timing of the IET that are necessary to make the IET acceptable.

Final confirmation of an IET

OC7.5.10 The date and time of an IET will be confirmed between NGET and the User, together with any limitations and restrictions on operation of Plant and/or Apparatus.

OC7.5.11 The IET may subsequently be amended following discussion and agreement between NGET and the User.

Carrying out an IET

OC7.5.12 IETs may only take place when agreement has been reached and must be carried out in accordance with the agreed programme of testing.

OC7.5.13 The implementation of an IET will be notified in accordance with OC7.4.5.

OC7.5.14 Where elements of the programme of testing change during the IET, there must be discussion between the appropriate parties to identify whether the IET should continue.

OC7.6 PROCEDURE IN RESPECT OF OPERATIONAL SWITCHING IN SCOTLAND AND OFFSHORE
OC7.6.1 This section OC7.6 of the Grid Code sets out the procedure to be followed for Operational Switching in Scotland and Offshore. Its provisions are supplementary to the provisions of the rest of this OC7.

It is designed to set down the arrangements for NGET, Users and the Relevant Transmission Licensees in respect of the Operational Switching of Plant and Apparatus at a Connection Site and parts of the National Electricity Transmission System adjacent to that Connection Site.

OC7.6.2 In general:

(i) NGET is responsible for directing the configuration of the National Electricity Transmission System

(ii) Each Relevant Transmission Licensee is responsible for the instruction and operation of its Plant and Apparatus on its Transmission System

(iii) Each User is responsible for the configuration, instruction and operation of its Plant and Apparatus.

Definitive schedules of these responsibilities for each Connection Site are contained in the relevant Site Responsibility Schedules.

For the avoidance of doubt, where a User operates Transmission Plant and Apparatus on behalf of a Relevant Transmission Licensee, NGET cannot instruct the User to operate that Plant and Apparatus.

Planned Operational Switching

OC7.6.3 Following the notification of an Operation under OC7.4.5, NGET and the User shall discuss the Operational Switching required. NGET will then discuss and agree the details of the Operational Switching with the Relevant Transmission Licensee. The Relevant Transmission Licensee shall then make contact with the User to initiate the Operational Switching. For the avoidance of doubt, from the time that the Relevant Transmission Licensee makes contact with the User, the Relevant Transmission Licensee shall then become the primary point of operational contact with the User in relation to OC7 for matters which would or could affect, or would or could be affected by the Operational Switching.

OC7.6.4 The User shall be advised by the Relevant Transmission Licensee on the completion of the Operational Switching, that NGET shall again become the primary point of operational contact for the User in relation to OC7.

OC7.6.5 During Operational Switching, either the Relevant Transmission Licensee or the User may need to unexpectedly terminate the Operational Switching. NGET may also need to terminate the Operational Switching during the Operational Switching. In the event of unexpected termination of the Operational Switching, NGET shall become the primary point of operational contact for the User in relation to OC7. Following the termination of the Operational Switching, it will not be permitted to restart that Operational Switching without the parties again following the process described in OC7.6.3.
Emergencies

OC7.6.6 For Operations and/or Events that present an immediate hazard to the safety of personnel, Plant or Apparatus, the Relevant Transmission Licensee may:

(i) as permitted by the STC, carry out Operational Switching of Plant and Apparatus on its Transmission System without reference to NGET and the User, and

(ii) request a User to carry out Operational Switching without the User first receiving notification from NGET.

In such emergency circumstances, communication between the Relevant Transmission Licensee and the User shall normally be by telephone and will include an exchange of names. The User shall use all reasonable endeavours to carry out Operational Switching on its Plant and Apparatus without delay. Following completion of the requested Operational Switching, the Relevant Transmission Licensee shall notify NGET of the Operational Switching which has taken place. In such emergency circumstances, the User may only refuse to carry out Operational Switching on safety grounds (relating to personnel or plant) and this must be notified to the Relevant Transmission Licensee immediately by telephone.

OC7.6.7 For Operations and/or Events that present an immediate hazard to the safety of personnel, Plant or Apparatus, and which require Operational Switching of Plant or Apparatus on a Transmission System in order to remove the hazard, the User should contact the Relevant Transmission Licensee directly to request Operational Switching of Plant or Apparatus on its Transmission System.

In such emergency circumstances, communication between the Relevant Transmission Licensee and the User shall normally be by telephone and will include an exchange of names. The Relevant Transmission Licensee shall use all reasonable endeavours to carry out Operational Switching on its Plant and Apparatus without delay. Following completion of the requested Operational Switching, the User shall notify NGET of the Operational Switching which has taken place. In such emergency circumstances, the Relevant Transmission Licensee may only refuse to carry out Operational Switching on safety grounds (relating to personnel or plant) and this must be notified to the User immediately by telephone.

OC7.6.8 Establishment of a Local Switching Procedure

(a) NGET, a User or a Relevant Transmission Licensee may reasonably require a Local Switching Procedure to be established.

(b) Where the need for a Local Switching Procedure arises the following provisions shall apply:-

(i) NGET, User(s) and the Relevant Transmission Licensee will discuss and agree the detail of the Local Switching Procedure as soon as the requirement for a Local Switching Procedure is identified. NGET will notify the Relevant Transmission Licensee and the affected User(s) and will initiate these discussions.
(ii) Each Local Switching Procedure shall be in relation to either one
or more Connection Sites and parts of the National Electricity
Transmission System adjacent to the Connection Site(s).

(iii) A draft Local Switching Procedure shall be prepared by the
Relevant Transmission Licensee to reflect the agreement
reached and shall be sent to NGET.

(iv) When a Local Switching Procedure has been prepared, it shall
be sent by NGET to the Relevant Transmission Licensee and
User(s) for confirmation of its accuracy.

(v) The Local Switching Procedure shall then be signed on behalf of
NGET and on behalf of each User and Relevant Transmission
Licensee by way of written confirmation of its accuracy.

(vi) Once agreed under this OC7.6.8, the procedure will become a
Local Switching Procedure under the Grid Code, and (subject to
any change pursuant to this OC7) will apply between NGET,
Relevant Transmission Licensee and the relevant User(s) as if it
were part of the Grid Code.

(vii) Once signed, NGET will send a copy of the Local Switching
Procedure to the Relevant Transmission Licensee and the
User(s).

(viii) An agreed Local Switching Procedure should be referenced by relevant
Site Responsibility Schedules.

(ix) NGET, the User(s) and the Relevant Transmission Licensee must make
the Local Switching Procedure readily available to the relevant
operational staff.

(x) If the Relevant Transmission Licensee or the User(s) become aware
that a change is needed to a Local Switching Procedure, they must
inform NGET immediately. Where NGET has been informed of a need for
a change, or NGET proposes a change, NGET shall notify both the
affected User and the Relevant Transmission Licensee and will initiate
discussions to agree a change to the Local Switching Procedure. The
principles applying to the establishment of a new Local Switching
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<td>All timescales where there is a high risk of Demand reduction. Primarily 1200 hours onwards for a future period.</td>
<td>Insufficient generation available to meet forecast Demand plus Operating Margin and/or a high risk of Demand reduction being instructed. (May be issued locally as Demand reduction risk only for circuit overloads)</td>
<td>Offers of increased availability from Generators or DC Converter Station owners and Interconnector Users. Suppliers notify NGET of any additional Customer Demand Management that they will initiate. Specified Network Operators and Non-Embedded Customers to prepare to take action as necessary to enable compliance with NGET instructions that may follow. (Percentages of Demand reduction above 20% may not be achieved if NGET has not issued the warning by 1600 hours the previous day)</td>
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OPERATING CODE NO.8

SAFETY CO-ORDINATION

OC8.1 INTRODUCTION

OC8.1.1 OC8 specifies the standard procedures to be used for the co-ordination, establishment and maintenance of necessary Safety Precautions when work is to be carried out on or near the National Electricity Transmission System or the System of a User and when there is a need for Safety Precautions on HV Apparatus on the other System for this work to be carried out safely. OC8 Appendix 1 applies when work is to be carried out on or near to E&W Transmission Systems or the Systems of E&W Users and OC8 Appendix 2 applies when work is to be carried out on or near to Scottish Transmission Systems or the Systems of Scottish Users.

OC8.1.2 OC8 also covers the co-ordination, establishment and maintenance of necessary safety precautions on the Implementing Safety Co-ordinator’s System when work is to be carried out at a User’s Site or a Transmission Site (as the case may be) on equipment of the User or a Transmission Licensee as the case may be where the work or equipment is near to HV Apparatus on the Implementing Safety Co-ordinator’s System.

OC.8.2 OBJECTIVE

OC8.2.1 The objective of OC8 is to achieve:-

(i) Safety From The System when work on or near a System necessitates the provision of Safety Precautions on another System on HV Apparatus up to a Connection Point; and

(ii) Safety From The System when work is to be carried out at a User’s Site or a Transmission Site (as the case may be) on equipment of the User or a Transmission Licensee (as the case may be) where the work or equipment is near to HV Apparatus on the Implementing Safety Co-ordinator’s System.

OC8.3 SCOPE

OC8.3.1 OC8 applies to NGET and to Users, which in OC8 means:-

(a) Generators;

(b) Network Operators; and

(c) Non-Embedded Customers.

In Scotland and Offshore OC8 also applies to Relevant Transmission Licensees.
The procedures for the establishment of safety co-ordination by NGET in relation to External Interconnections are set out in Interconnection Agreements with relevant persons for the External Interconnections.

OC8.4 PROCEDURE

OC8.4.1 Safety Co-ordination in respect of the E&W Transmission Systems or the Systems of E&W Users

OC8.4.1.1 OC8 Appendix 1, OC8A, applies when work is to be carried out on or near to the E&W Transmission System or the Systems of E&W Users or when Safety Precautions are required to be established on the E&W Transmission System or the Systems of E&W Users when work is to be carried out on or near to the Scottish Transmission System or the Systems of Scottish Users.

OC8.4.2 Safety Co-ordination in respect of the Scottish Transmission Systems or the Systems of Scottish Users

OC8.4.2.1 OC8 Appendix 2, OC8B, applies when work is to be carried out on or near to the Scottish Transmission System or the Systems of Scottish Users or when Safety Precautions are required to be established on the Scottish Transmission System or the Systems of Scottish Users when work is to be carried out on or near to the E&W Transmission System or the Systems of E&W Users.

OC8.4.3 Safety Co-ordination Offshore

OC8.4.3.1 For the purposes of OC8 Appendix 1, OC8A, OC8 Appendix 2 and OC8B, when work is to be carried out on or near to Offshore Transmission Systems Safety Precautions shall be established by the Offshore Transmission Licensee and the Offshore User.
SAFETY CO-ORDINATION IN RESPECT OF THE E&W TRANSMISSION SYSTEMS OR
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SAFETY CO-ORDINATION ON THE E&W TRANSMISSION SYSTEM

OC8A.1 INTRODUCTION

OC8A.1.1 OC8A specifies the standard procedures to be used by the Relevant E&W Transmission Licensee, NGET (where NGET is not the Relevant E&W Transmission Licensee) and Users for the co-ordination, establishment and maintenance of necessary Safety Precautions when work is to be carried out on or near the E&W Transmission System or the System of an E&W User and when there is a need for Safety Precautions on HV Apparatus on the other's System for this work to be carried out safely. OC8A applies to Relevant E&W Transmission Licensees and E&W Users only. Where work is to be carried out on or near equipment on the Scottish Transmission System or Systems of Scottish Users, but such work requires Safety Precautions to be established on the E&W Transmission System or the Systems of E&W Users, OC8A should be followed by the Relevant E&W Transmission Licensee and E&W Users to establish the required Safety Precautions.

OC8B specifies the procedures to be used by the Relevant Scottish Transmission Licensees and Scottish Users.

In this OC8A the term “work” includes testing, other than System Tests which are covered by OC12.

OC8A.1.2 OC8A also covers the co-ordination, establishment and maintenance of necessary safety precautions on the Implementing Safety Co-ordinator’s System when work is to be carried out at an E&W User's Site or a Transmission Site (as the case may be) on equipment of the E&W User or the Relevant E&W Transmission Licensee as the case may be where the work or equipment is near to HV Apparatus on the Implementing Safety Co-ordinator’s System.

OC8A.1.3 OC8A does not apply to the situation where Safety Precautions need to be agreed solely between E&W Users. OC8A does not apply to the situation where Safety Precautions need to be agreed solely between Transmission Licensees.

OC8A.1.4 OC8A does not seek to impose a particular set of Safety Rules on the Relevant E&W Transmission Licensee and E&W Users; the Safety Rules to be adopted and used by the Relevant E&W Transmission Licensee and each E&W User shall be those chosen by each.

OC8A.1.5 Site Responsibility Schedules document the control responsibility for each item of Plant and Apparatus for each site.

OC8A.1.6 Defined terms
OC8A.1.6.1 E&W Users should bear in mind that in OC8 only, in order that OC8 reads more easily with the terminology used in certain Safety Rules, the term "HV Apparatus" is defined more restrictively and is used accordingly in OC8A. E&W Users should, therefore, exercise caution in relation to this term when reading and using OC8A.

OC8A.1.6.2 In OC8A only the following terms shall have the following meanings:

(1) "HV Apparatus" means High Voltage electrical circuits forming part of a System, on which Safety From The System may be required or on which Safety Precautions may be applied to allow work to be carried out on a System.

(2) "Isolation" means the disconnection of Apparatus from the remainder of the System in which that Apparatus is situated by either of the following:

(a) an Isolating Device maintained in an isolating position. The isolating position must either be:

(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

(ii) maintained and/or secured by such other method which must be in accordance with the Local Safety Instructions of the Relevant E&W Transmission Licensee or that E&W User, as the case may be; or

(b) an adequate physical separation which must be in accordance with, and maintained by, the method set out in the Local Safety Instructions of the Relevant E&W Transmission Licensee or that E&W User, as the case may be, and, if it is a part of that method, a Caution Notice must be placed at the point of separation;

or

(c) in the case where the relevant HV Apparatus of the Implementing Safety Co-ordinator is being either constructed or modified, an adequate physical separation as a result of a No System Connection.

(3) “No System Connection” means an adequate physical separation (which must be in accordance with, and maintained by, the method set out in the Local Safety Instructions of the Implementing Safety Co-ordinator) of the Implementing Safety Co-ordinator's HV Apparatus from the rest of the Implementing Safety Co-ordinator's System where such HV Apparatus has no installed means of being connected to, and will not for the duration of the
Safety Precaution be connected to, a source of electrical energy or to any other part of the Implementing Safety Co-ordinators System.

(4) "Earthing" means a way of providing a connection between conductors and earth by an Earthing Device which is either:

(i) 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

(ii) maintained and/or secured in position by such other method which must be in accordance with the Local Safety Instructions of the Relevant E&W Transmission Licensee or that E&W User as the case may be.

OC8A.1.6.3 For the purpose of the co-ordination of safety relating to HV Apparatus the term “Safety Precautions” means Isolation and/or Earthing.

OC8A.2 OBJECTIVE

OC8A.2.1 The objective of OC8A is to achieve:-

(i) Safety From The System when work on or near a System necessitates the provision of Safety Precautions on another System on HV Apparatus up to a Connection Point; and

(ii) Safety From The System when work is to be carried out at an E&W User’s Site or a Transmission Site (as the case may be) on equipment of the User or the Relevant E&W Transmission Licensee (as the case may be) where the work or equipment is near to HV Apparatus on the Implementing Safety Co-ordinator’s System.

OC8A.2.2 A flow chart, set out in OC8A Appendix C, illustrates the process utilised in OC8A to achieve the objective set out in OC8A.2.1. In the case of a conflict between the flow chart and the provisions of the written text of OC8A, the written text will prevail.

OC8A.3 SCOPE

OC8A.3.1 OC8A applies to the Relevant E&W Transmission Licensee and to E&W Users, which in OC8A means:-

(a) Generators;

(b) Network Operators; and

(c) Non-Embedded Customers.
The procedures for the establishment of safety co-ordination by the Relevant E&W Transmission Licensee in relation to External Interconnections are set out in Interconnection Agreements with relevant persons for the External Interconnections.

OC8A.4 PROCEDURE

OC8A.4.1 Approval of Local Safety Instructions

OC8A.4.1.1 (a) In accordance with the timing requirements of its Bilateral Agreement, each E&W User will supply to the Relevant E&W Transmission Licensee a copy of its Local Safety Instructions relating to its side of the Connection Point at each Connection Site.

(b) In accordance with the timing requirements of each Bilateral Agreement, the Relevant E&W Transmission Licensee will supply to each E&W User a copy of its Local Safety Instructions relating to the Transmission side of the Connection Point at each Connection Site.

(c) Prior to connection the Relevant E&W Transmission Licensee and the E&W User must have approved each other’s relevant Local Safety Instructions in relation to Isolation and Earthing.

OC8A.4.1.2 Either party may require that the Isolation and/or Earthing provisions in the other party’s Local Safety Instructions affecting the Connection Site should be made more stringent in order that approval of the other party’s Local Safety Instructions can be given. Provided these requirements are not unreasonable, the other party will make such changes as soon as reasonably practicable. These changes may need to cover the application of Isolation and/or Earthing at a place remote from the Connection Site, depending upon the System layout. Approval may not be withheld because the party required to approve reasonably believes the provisions relating to Isolation and/or Earthing are too stringent.

OC8A.4.1.3 If, following approval, a party wishes to change the provisions in its Local Safety Instructions relating to Isolation and/or Earthing, it must inform the other party. If the change is to make the provisions more stringent, then the other party merely has to note the changes. If the change is to make the provisions less stringent, then the other party needs to approve the new provisions and the procedures referred to in OC8A.4.1.2 apply.

OC8A.4.2 Safety Co-ordinators

OC8A.4.2.1 For each Connection Point, the Relevant E&W Transmission Licensee and each E&W User will at all times have nominated and available a person or persons (“Safety Co-ordinator(s)”) to be responsible for the co-ordination of Safety Precautions when work is to be carried out on a System which necessitates the provision of Safety Precautions on HV Apparatus pursuant to OC8A. A Safety Co-ordinator may be responsible for the co-ordination of safety on HV Apparatus at more than one Connection Point.
OC8A.4.2.2 Each Safety Co-ordinator shall be authorised by the Relevant E&W Transmission Licensee or an E&W User, as the case may be, as competent to carry out the functions set out in OC8A to achieve Safety From The System. Confirmation from the Relevant E&W Transmission Licensee or an E&W User, as the case may be, that its Safety Co-ordinator(s) as a group are so authorised is dealt with in CC.5.2. Only persons with such authorisation will carry out the provisions of OC8A.

OC8A.4.2.3 Contact between Safety Co-ordinators will be made via normal operational channels, and accordingly separate telephone numbers for Safety Co-ordinators need not be provided. At the time of making contact, each party will confirm that they are authorised to act as a Safety Co-ordinator, pursuant to OC8A.

OC8A.4.2.4 If work is to be carried out on a System, or on equipment of the Relevant E&W Transmission Licensee or an E&W User near to a System, as provided in this OC8A, which necessitates the provision of Safety Precautions on HV Apparatus in accordance with the provisions of OC8A, the Requesting Safety Co-ordinator who requires the Safety Precautions to be provided shall contact the relevant Implementing Safety Co-ordinator to co-ordinate the establishment of the Safety Precautions.

OC8A.4.3 RISSP

OC8A.4.3.1 OC8A sets out the procedures for utilising the RISSP, which will be used except where dealing with equipment in proximity to the other’s System as provided in OC8A.8. Sections OC8A.4 to OC8A.7 inclusive should be read accordingly.

OC8A.4.3.2 The Relevant E&W Transmission Licensee will use the format of the RISSP forms set out in Appendix A and Appendix B to OC8A. That set out in OC8A Appendix A and designated as "RISSP-R", shall be used when the Relevant E&W Transmission Licensee is the Requesting Safety Co-ordinator, and that in OC8A Appendix B and designated as "RISSP-I", shall be used when the Relevant E&W Transmission Licensee is the Implementing Safety Co-ordinator. Proformas of RISSP-R and RISSP-I will be provided for use by the Relevant E&W Transmission Licensee staff.

OC8A.4.3.3 (a) E&W Users may either adopt the format referred to in OC8A.4.3.2, or use an equivalent format, provided that it includes sections requiring insertion of the same information and has the same numbering of sections as RISSP-R and RISSP-I as set out in Appendices A and B respectively.

(b) Whether E&W Users adopt the format referred to in OC8A.4.3.2, or use the equivalent format as above, the format may be produced and held in, and retrieved from an electronic form by the E&W User.

(c) Whichever method E&W Users choose, each must provide proformas (whether in tangible or electronic form) for use by its staff.

OC8A.4.3.4 All references to RISSP-R and RISSP-I shall be taken as referring to the corresponding parts of the alternative forms or other tangible written or electronic records used by each E&W User.
OC8A.4.3.5 RISSP-R will have an identifying number written or printed on it, comprising a prefix which identifies the location at which it is issued, and a unique (for each E&W User or the Relevant E&W Transmission Licensee, as the case may be) serial number consisting of four digits and the suffix "R".

OC8A.4.3.6 (a) In accordance with the timing requirements set out in CC.5.2 each E&W User shall apply in writing to the Relevant E&W Transmission Licensee for the Relevant E&W Transmission Licensee's approval of its proposed prefix.

(b) The Relevant E&W Transmission Licensee shall consider the proposed prefix to see if it is the same as (or confusingly similar to) a prefix used by the Relevant E&W Transmission Licensee or another User and shall, as soon as possible (and in any event within ten days), respond in writing to the E&W User with its approval or disapproval.

(c) If the Relevant E&W Transmission Licensee disapproves, it shall explain in its response why it has disapproved and will suggest an alternative prefix.

(d) If the Relevant E&W Transmission Licensee has disapproved, then the E&W User shall either notify the Relevant E&W Transmission Licensee in writing of its acceptance of the suggested alternative prefix or it shall apply in writing to the Relevant E&W Transmission Licensee with revised proposals and the above procedure shall apply to that application.

OC8A.4.3.7 The prefix allocation will be periodically circulated by NGET to all E&W Users, for information purposes, using a National Grid Safety Circular in the form set out in OC8A Appendix D.

OC8A.5 SAFETY PRECAUTIONS ON HV APPARATUS

OC8A.5.1 Agreement of Safety Precautions

OC8A.5.1.1 The Requesting Safety Co-ordinator who requires Safety Precautions on another System(s) will contact the relevant Implementing Safety Co-ordinator(s) to agree the Location of the Safety Precautions to be established. This agreement will be recorded in the respective Safety Logs.

OC8A.5.1.2 It is the responsibility of the Implementing Safety Co-ordinator to ensure that adequate Safety Precautions are established and maintained, on his and/or another System connected to his System, to enable Safety From The System to be achieved on the HV Apparatus, specified by the Requesting Safety Co-ordinator which is to be identified in Part 1.1 of the RISSP. Reference to another System in this OC8A.5.1.2 shall not include the Requesting Safety Co-ordinator's System which is dealt with in OC8A.5.1.3.

OC8A.5.1.3 When the Implementing Safety Co-ordinator is of the reasonable opinion that it is necessary for Safety Precautions on the System of the Requesting Safety Co-ordinator, other than on the HV Apparatus specified by the Requesting Safety Co-ordinator, which is to be identified in Part 1.1 of the RISSP, he shall contact the Requesting Safety Co-ordinator and the details shall be recorded in part 1.1 of the RISSP forms. In these circumstances it is the responsibility of the Requesting Safety Co-ordinator to establish and maintain such Safety Precautions.
OC8A.5.1.4 In the event of disagreement

In any case where the Requesting Safety Co-ordinator and the Implementing Safety Co-ordinator are unable to agree the Location of the Isolation and (if requested) Earthing, both shall be at the closest available points on the infeeds to the HV Apparatus on which Safety From The System is to be achieved as indicated on the Operation Diagram.

OC8A.5.2 Implementation of Isolation

OC8A.5.2.1 Following the agreement of the Safety Precautions in accordance with OC8A.5.1 the Implementing Safety Co-ordinator shall then establish the agreed Isolation.

OC8A.5.2.2 The Implementing Safety Co-ordinator shall confirm to the Requesting Safety Co-ordinator that the agreed Isolation has been established, and identify the Requesting Safety Co-ordinator's HV Apparatus up to the Connection Point, for which the Isolation has been provided. The confirmation shall specify:

(a) for each Location, the identity (by means of HV Apparatus name, nomenclature and numbering or position, as applicable) of each point of Isolation;

(b) whether Isolation has been achieved by an Isolating Device in the isolating position, by an adequate physical separation or as a result of a No System Connection;

(c) where an Isolating Device has been used whether the isolating position is either:

(i) maintained by immobilising and Locking the Isolating Device in the isolating position and affixing a Caution Notice to it. Where the Isolating Device has been Locked with a Safety Key, the confirmation shall specify that the Safety Key has been secured in a Key Safe and the Key Safe Key has been given to the authorised site representative of the Requesting Safety Co-ordinator where reasonably practicable and is to be retained in safe custody. Where not reasonably practicable (including where Earthing has been requested in OC8A.5.1), the confirmation shall specify that the Key Safe Key will be retained by the authorised site representative of the Implementing Safety Co-ordinator in safe custody; or

(ii) maintained and/or secured by such other method which must be in accordance with the Local Safety Instructions of the Relevant E&W Transmission Licensee or that E&W User, as the case may be; and

(d) where an adequate physical separation has been used that it will be in accordance with, and maintained by, the method set out in the Local Safety Instructions of the Relevant E&W Transmission Licensee or that E&W User, as the case may be, and, if it is a part of that method, that a Caution Notice has been placed at the point of separation;
(e) Where a No System Connection has been used the physical position of the No System Connection shall be defined and shall not be varied for the duration of Safety Precaution and the Implementing Safety Co-ordinator’s relevant HV Apparatus will not, for the duration of the Safety Precaution be connected to a source of electrical energy or to any other part of the Implementing Safety Co-ordinator’s System.

The confirmation of Isolation shall be recorded in the respective Safety Logs.

OC8A.5.2.3 Following the confirmation of Isolation being established by the Implementing Safety Co-ordinator and the necessary establishment of relevant Isolation on the Requesting Safety Co-ordinators System, the Requesting Safety Co-ordinator will then request the implementation of Earthing by the Implementing Safety Co-ordinator, if agreed in section OC8A.5.1. If the implementation of Earthing has been agreed, then the authorised site representative of the Implementing Safety Co-ordinator shall retain any Key Safe Key in safe custody until any Safety Key used for Earthing has been secured in the Key Safe.

OC8A.5.3 Implementation of Earthing

OC8A.5.3.1 The Implementing Safety Co-ordinator shall then establish the agreed Earthing.

OC8A.5.3.2 The Implementing Safety Co-ordinator shall confirm to the Requesting Safety Co-ordinator that the agreed Earthing has been established, and identify the Requesting Safety Co-ordinator’s HV Apparatus up to the Connection Point, for which the Earthing has been provided. The confirmation shall specify:

(a) for each Location, the identity (by means of HV Apparatus name, nomenclature and numbering or position, as is applicable) of each point of Earthing; and

(b) in respect of the Earthing Device used, whether it is:

(i) immobilised and Locked in the earthing position. Where the Earthing Device has been Locked with a Safety Key, that the Safety Key has been secured in a Key Safe and the Key Safe Key has been given to the authorised site representative of the Requesting Safety Co-ordinator where reasonably practicable and is to be retained in safe custody. Where not reasonably practicable, that the Key Safe Key will be retained by the authorised site representative of the Implementing Safety Co-ordinator in safe custody; or

(ii) maintained and/or secured in position by such other method which is in accordance with the Local Safety Instructions of the Relevant E&W Transmission Licensee or the Relevant Transmission Licensee or that E&W User, as the case may be.
The confirmation of **Earthing** shall be recorded in the respective **Safety Logs**.

**OC8A.5.3.3.** The **Implementing Safety Co-ordinator** shall ensure that the established **Safety Precautions** are maintained until requested to be removed by the relevant **Requesting Safety Co-ordinator**.

**OC8A.5.4 ** **RISSP Issue Procedure**

**OC8A.5.4.1** Where **Safety Precautions** on another **System(s)** are being provided to enable work on the **Requesting Safety Co-ordinator's System**, before any work commences they must be recorded by a **RISSP** being issued. The **RISSP** is applicable to **HV Apparatus** up to the **Connection Point** identified in section 1.1 of the **RISSP-R** and **RISSP-I** forms.

**OC8A.5.4.2** Where **Safety Precautions** are being provided to enable work to be carried out on both sides of the **Connection Point** a **RISSP** will need to be issued for each side of the **Connection Point** with the **Relevant E&W Transmission Licensee** and the respective **User** each enacting the role of **Requesting Safety Co-ordinator**. This will result in a **RISSP-R** and a **RISSP-I** form being completed by each of the **Relevant E&W Transmission Licensee** and the **E&W User**, with each **Requesting Safety Co-ordinator** issuing a separate **RISSP** number.

**OC8A.5.4.3** Once the **Safety Precautions** have been established (in accordance with **OC8A.5.2** and **OC8A.5.3**), the **Implementing Safety Co-ordinator** shall complete parts 1.1 and 1.2 of a **RISSP-I** form recording the details specified in **OC8A.5.1.3**, **OC8A.5.2.2** and **OC8A.5.3.2**. Where **Earthing** has not been requested, Part 1.2(b) will be completed with the words “not applicable” or “N/A”. He shall then contact the **Requesting Safety Co-ordinator** to pass on these details.

**OC8A.5.4.4** The **Requesting Safety Co-ordinator** shall complete Parts 1.1 and 1.2 of the **RISSP-R**, making a precise copy of the details received. On completion, the **Requesting Safety Co-ordinator** shall read the entries made back to the sender and check that an accurate copy has been made.

**OC8A.5.4.5** The **Requesting Safety Co-ordinator** shall then issue the number of the **RISSP**, taken from the **RISSP-R**, to the **Implementing Safety Co-ordinator** who will ensure that the number, including the prefix and suffix, is accurately recorded in the designated space on the **RISSP-I** form.

**OC8A.5.4.6** The **Requesting Safety Co-ordinator** and the **Implementing Safety Co-ordinator** shall complete and sign Part 1.3 of the **RISSP-R** and **RISSP-I** respectively and then enter the time and date. When signed no alteration to the **RISSP** is permitted; the **RISSP** may only be cancelled.

**OC8A.5.4.7** The **Requesting Safety Co-ordinator** is then free to authorise work (including a test that does not affect the **Implementing Safety Co-ordinator's System**) in accordance with the requirements of the relevant internal safety procedures which apply to the **Requesting Safety Co-ordinator's System**. This is likely to involve the issue of safety documents or other relevant internal authorisations. Where testing is to be carried out which affects the **Implementing Safety Co-ordinator's System**, the procedure set out below in **OC8A.6** shall be implemented.
OC8A.5.5  RISSP Cancellation Procedure

OC8A.5.5.1 When the Requesting Safety Co-ordinator decides that Safety Precautions are no longer required, he will contact the relevant Implementing Safety Co-ordinator to effect cancellation of the associated RISSP.

OC8A.5.5.2 The Requesting Safety Co-ordinator will inform the relevant Implementing Safety Co-ordinator of the RISSP identifying number (including the prefix and suffix), and agree it is the RISSP to be cancelled.

OC8A.5.5.3 The Requesting Safety Co-ordinator and the relevant Implementing Safety Co-ordinator shall then respectively complete Part 2.1 of their respective RISSP-R and RISSP-I forms and shall then exchange details. The details being exchanged shall include their respective names and time and date. On completion of the exchange of details the respective RISSP is cancelled. The removal of Safety Precautions is as set out in OC8A.5.5.4 and OC8A.5.5.5.

OC8A.5.5.4 Neither Safety Co-ordinator shall instruct the removal of any Isolation forming part of the Safety Precautions as part of the returning of the HV Apparatus to service until it is confirmed to each by each other that every earth on each side of the Connection Point, within the points of isolation identified on the RISSP, has been removed or disconnected by the provision of additional Points of Isolation.

OC8A.5.5.5 Subject to the provisions in OC8A.5.5.4, the Implementing Safety Co-ordinator is then free to arrange the removal of the Safety Precautions, the procedure to achieve that being entirely an internal matter for the party the Implementing Safety Co-ordinator is representing. Where a Key Safe Key has been given to the authorised site representative of the Requesting Safety Co-ordinator, the Key Safe Key must be returned to the authorised site representative of the Implementing Safety Co-ordinator. The only situation in which any Safety Precautions may be removed without first cancelling the RISSP in accordance with OC8A.5.5 or OC8A.5.6 is when Earthing is removed in the situation envisaged in OC8A.6.2(b).

OC8A.5.6  RISSP Change Control

Nothing in this OC8A prevents the Relevant E&W Transmission Licensee and E&W Users agreeing to a simultaneous cancellation and issue of a new RISSP, if both agree. It should be noted, however, that the effect of that under the relevant Safety Rules is not a matter with which the Grid Code deals.

OC8A.6  TESTING AFFECTING ANOTHER SAFETY CO-ORDINATOR'S SYSTEM

OC8A.6.1 The carrying out of the test may affect Safety Precautions on RISSPs or work being carried out which does not require a RISSP. Testing can, for example, include the application of an independent test voltage. Accordingly, where the Requesting Safety Co-ordinator wishes to authorise the carrying out of such a test to which the procedures in OC8A.6 apply he may not do so and the test will not take place unless and until the steps in (a)-(c) below have been followed and confirmation of completion has been recorded in the respective Safety Logs:
(a) confirmation must be obtained from the **Implementing Safety Co-ordinator** that:

(i) no person is working on, or testing, or has been authorised to work on, or test, any part of its **System** or another **System(s)** (other than the **System** of the **Requesting Safety Co-ordinator**) within the points of **Isolation** identified on the **RISSP** form relating to the test which is proposed to be undertaken, and

(ii) no person will be so authorised until the proposed test has been completed (or cancelled) and the **Requesting Safety Co-ordinator** has notified the **Implementing Safety Co-ordinator** of its completion (or cancellation);

(b) any other current **RISSPs** which relate to the parts of the **System** in which the testing is to take place must have been cancelled in accordance with procedures set out in OC8A.5.5;

(c) the **Implementing Safety Co-ordinator** must agree with the **Requesting Safety Co-ordinator** to permit the testing on that part of the **System** between the points of **Isolation** identified in the **RISSP** associated with the test and the points of **Isolation** on the **Requesting Safety Co-ordinator's System**.

OC8A.6.2  
(a) The **Requesting Safety Co-ordinator** will inform the **Implementing Safety Co-ordinator** as soon as the test has been completed or cancelled and the confirmation shall be recorded in the respective **Safety Logs**.

(b) When the test gives rise to the removal of **Earthing** which it is not intended to re-apply, the relevant **RISSP** associated with the test shall be cancelled at the completion or cancellation of the test in accordance with the procedure set out in either OC8A.5.5 or OC8A.5.6. Where the **Earthing** is re-applied following the completion or cancellation of the test, there is no requirement to cancel the relevant **RISSP** associated with the test pursuant to this OC8A.6.2.

OC8A.7  
**EMERGENCY SITUATIONS**

OC8A.7.1  
There may be circumstances where **Safety Precautions** need to be established in relation to an unintended electrical connection or situations where there is an unintended risk of electrical connection between the **National Electricity Transmission System** and an **E&W User's System**, for example resulting from an incident where one line becomes attached or unacceptably close to another.

OC8A.7.2  
In those circumstances, if both the **Relevant E&W Transmission Licensee** and the respective **E&W User** agree, the relevant provisions of OC8A.5 will apply as if the electrical connections or potential connections were, solely for the purposes of this **OC8A**, a **Connection Point**.

OC8A.7.3  
(a) The relevant **Safety Co-ordinator** shall be that for the electrically closest existing **Connection Point** to that **E&W User's System** or such other local **Connection Point** as may be agreed between the **Relevant E&W Transmission Licensee** and the **E&W User**, with discussions taking place
between the relevant local Safety Co-ordinators. The Connection Point to be used shall be known in this OC8A.7.3 as the "relevant Connection Point".

(b) The Local Safety Instructions shall be those which apply to the relevant Connection Point.

(c) The prefix for the RISSP will be that which applies for the relevant Connection Point.

OC8A.8 SAFETY PRECAUTIONS RELATING TO WORKING ON EQUIPMENT NEAR TO THE HV SYSTEM

OC8A.8 applies to the situation where work is to be carried out at an E&W User’s Site or a Transmission Site (as the case may be) on equipment of the User or the Relevant E&W Transmission Licensee as the case may be, where the work or equipment is near to HV Apparatus on the Implementing Safety Co-ordinator’s System. It does not apply to other situations to which OC8A applies. In this part of OC8A, a Permit for Work for proximity work is to be used, rather than the usual RISSP procedure, given the nature and effect of the work, all as further provided in the OC8A.8.

OC8A.8.1 Agreement of Safety Precautions

OC8A.8.1.1 The Requesting Safety Co-ordinator who requires Safety Precautions on another System(s) when work is to be carried out at an E&W User’s Site or a Transmission Site (as the case may be) on equipment of the User or the Relevant E&W Transmission Licensee, as the case may be, where the work or equipment is near to HV Apparatus on the Implementing Safety Co-ordinator’s System will contact the relevant Implementing Safety Co-ordinator(s) to agree the Location of the Safety Precautions to be established, having as part of this process informed the Implementing Safety Co-ordinator of the equipment and the work to be undertaken. The respective Safety Co-ordinators will ensure that they discuss the request with their authorised site representative and that the respective authorised site representatives discuss the request at the Connection Site. This agreement will be recorded in the respective Safety Logs.

OC8A.8.1.2 It is the responsibility of the Implementing Safety Co-ordinator, working with his authorised site representative as appropriate, to ensure that adequate Safety Precautions are established and maintained, on his and/or another System connected to his System, to enable Safety From The System to be achieved for work to be carried out at an E&W User’s Site or a Transmission Site (as the case may be) on equipment and in relation to work which is to be identified in the relevant part of the Permit for Work for proximity work where the work or equipment is near to HV Apparatus of the Implementing Safety Co-ordinator’s System specified by the Requesting Safety Co-ordinator. Reference to another System in this OC8A.8.1.2 shall not include the Requesting Safety Co-ordinator’s System.

OC8A.8.1.3 In the event of disagreement

In any case where the Requesting Safety Co-ordinator and the Implementing Safety Co-ordinator are unable to agree the Location of the Isolation and (if
requested) **Earthing**, both shall be at the closest available points on the infeeds to the **HV Apparatus** near to which the work is to be carried out as indicated on the **Operation Diagram**.

**OC8A.8.2 Implementation of Isolation and Earthing**

**OC8A.8.2.1** Following the agreement of the **Safety Precautions** in accordance with OC8A.8.1 the **Implementing Safety Co-ordinator** shall then establish the agreed **Isolation** and (if required) **Earthing**.

**OC8A.8.2.2** The **Implementing Safety Co-ordinator** shall confirm to the **Requesting Safety Co-ordinator** that the agreed **Isolation** and (if required) **Earthing** has been established.

**OC8A.8.2.3** The **Implementing Safety Co-ordinator** shall ensure that the established **Safety Precautions** are maintained until requested to be removed by the relevant **Requesting Safety Co-ordinator**.

**OC8A.8.3 Permit for Work for proximity work Issue Procedure**

**OC8A.8.3.1** Where **Safety Precautions** on another **System(s)** are being provided to enable work to be carried out at an **E&W User's Site** or **Transmission Site** (as the case may be) on equipment where the work or equipment is in proximity to **HV Apparatus** of the **Implementing Safety Co-ordinator**, before any work commences they must be recorded by a **Permit for Work for proximity work** being issued. The **Permit for Work for proximity work** shall identify the **Implementing Safety Co-ordinator**'s **HV Apparatus** in proximity to the required work.

**OC8A.8.3.2** Once the **Safety Precautions** have been established (in accordance with OC8A.8.2), the **Implementing Safety Co-ordinator** shall agree to the issue of the **Permit for Work for proximity work** with the appropriately authorised site representative of the **Requesting Safety Co-ordinator**'s **Site**. The **Implementing Safety Co-ordinator** will inform the **Requesting Safety Co-ordinator** of the **Permit for Work for proximity work** identifying number.

**OC8A.8.3.3** The appropriately authorised site representative of the **Implementing Safety Co-ordinator** shall then issue the **Permit for Work for proximity work** to the appropriately authorised site representative of the **Requesting Safety Co-ordinator**. The **Permit for Work for proximity work** will in the section dealing with the work to be carried out, be completed to identify that the work is near the **Implementing Safety Co-ordinator**'s **HV Apparatus**. No further details of the **Requesting Safety Co-ordinator**'s work will be recorded, as that is a matter for the **Requesting Safety Co-ordinator** in relation to his work.

**OC8A.8.3.4** The **Requesting Safety Co-ordinator** is then free to authorise work in accordance with the requirements of the relevant internal safety procedures which apply to the **Requesting Safety Co-ordinator**'s **Site**. This is likely to involve the issue of safety documents or other relevant internal authorisations.

**OC8A.8.4 Permit for Work for proximity work Cancellation Procedure**
When the Requesting Safety Co-ordinator decides that Safety Precautions are no longer required, he will contact the relevant Implementing Safety Co-ordinator to effect cancellation of the associated Permit for Work for proximity work.

The Requesting Safety Co-ordinator will inform the relevant Implementing Safety Co-ordinator of the Permit for Work for proximity work identifying number, and agree that the Permit for Work for proximity work can be cancelled. The cancellation is then effected by the appropriately authorised site representative of the Requesting Safety Co-ordinator returning the Permit for Work for proximity work to the appropriately authorised site representative of the Implementing Safety Co-ordinator.

The Implementing Safety Co-ordinator is then free to arrange the removal of the Safety Precautions, the procedure to achieve that being entirely an internal matter for the party the Implementing Safety Co-ordinator is representing.

In any instance when any Safety Precautions may be ineffective for any reason the relevant Safety Co-ordinator shall inform the other Safety Co-ordinator(s) without delay of that being the case and, if requested, of the reasons why.  

The Relevant E&W Transmission Licensee and E&W Users shall maintain Safety Logs which shall be a chronological record of all messages relating to safety co-ordination under OC8A sent and received by the Safety Co-ordinator(s). The Safety Logs must be retained for a period of not less than one year.
PART 1

1.1 HV APPARATUS IDENTIFICATION

Safety Precautions have been established by the Implementing Safety Co-ordinator (or by another User on that User's System connected to the Implementing Safety Co-ordinator's System) to achieve (in so far as it is possible from that side of the Connection Point) Safety From The System on the following HV Apparatus on the Requesting Safety Co-ordinator's System: [State identity - name(s) and, where applicable, identification of the HV circuit(s) up to the Connection Point]:

________________________________________________________________________________

Further Safety precautions required on the Requesting Safety Co-ordinator's System as notified by the Implementing Safety Co-ordinator.

________________________________________________________________________________

1.2 SAFETY PRECAUTIONS ESTABLISHED

(a) ISOLATION

[State the Location(s) at which Isolation has been established (whether on the Implementing Safety Co-ordinator's System or on the System of another User connected to the Implementing Safety Co-ordinator's System). For each Location, identify each point of Isolation. For each point of Isolation, state the means by which the Isolation has been achieved, and whether, immobilised and Locked, Caution Notice affixed, other safety procedures applied, as appropriate.]

________________________________________________________________________________

(b) EARTHING

[State the Location(s) at which Earthing has been established (whether on the Implementing Safety Co-ordinator's System or on the System of another User connected to the Implementing Safety Co-ordinator's System). For each Location, identify each point of Earthing. For each point of Earthing, state the means by which Earthing has been achieved, and whether, immobilised and Locked, other safety procedures applied, as appropriate].

________________________________________________________________________________

1.3 ISSUE

I have received confirmation from _________________________________________ (name of Implementing Safety Co-ordinator) at _________________________________________ (location) that the Safety Precautions identified in paragraph 1.2 have been established and that instructions will not be issued at his location for their removal until this RISSP is cancelled.

Signed ................................................................ (Requesting Safety Co-ordinator)

at ........................................(time) on .................................................. (Date)

PART 2

2.1 CANCELLATION

I have confirmed to _________________________________________ (name of the Implementing Safety Co-ordinator) at _________________________________________ (location) that the Safety Precautions set out in paragraph 1.2 are no longer required and accordingly the RISSP is cancelled.

Signed ................................................................ (Requesting Safety Co-ordinator)

at ........................................(time) on .................................................. (Date)
RECORD OF INTER-SYSTEM SAFETY PRECAUTIONS (RISSP-I)

(Implementing Safety Co-ordinator’s Record)

PART 1

1.1 HV APPARATUS IDENTIFICATION

Safety Precautions have been established by the Implementing Safety Co-ordinator (or by another User on that User’s System connected to the Implementing Safety Co-ordinator’s System) to achieve (in so far as it is possible from that side of the Connection Point) Safety From The System on the following HV Apparatus on the Requesting Safety Co-ordinator’s System: [State identity - name(s) and, where applicable, identification of the HV circuit(s) up to the Connection Point]:

_______________________________________________________________________________________________________
_______________________________________________________________________________________________________

Recording of notification given to the Requesting Safety Co-ordinator concerning further Safety Precautions required on the Requesting Safety Co-ordinator’s System.

1.2 SAFETY PRECAUTIONS ESTABLISHED

(a) ISOLATION

[State the Location(s) at which Isolation has been established (whether on the Implementing Safety Co-ordinator’s System or on the System of another User connected to the Implementing Safety Co-ordinator’s System). For each Location, identify each point of Isolation. For each point of Isolation, state the means by which the Isolation has been achieved, and whether, immobilised and Locked, Caution Notice affixed, other safety procedures applied, as appropriate.]

_______________________________________________________________________________________________________
_______________________________________________________________________________________________________
_______________________________________________________________________________________________________

(b) EARTHING

[State the Location(s) at which Earthing has been established (whether on the Implementing Safety Co-ordinator’s System or on the System of another User connected to the Implementing Safety Co-ordinator’s System). For each Location, identify each point of Earthing. For each point of Earthing, state the means by which Earthing has been achieved, and whether, immobilised and Locked, other safety procedures applied, as appropriate].

_______________________________________________________________________________________________________
_______________________________________________________________________________________________________
_______________________________________________________________________________________________________

1.3 ISSUE

I have confirmed to ________________________________ (name of Requesting Safety Co-ordinator) at ____________________________ (location) that the Safety Precautions identified in paragraph 1.2 have been established and that instructions will not be issued at my location for their removal until this RISSP is cancelled.

Signed ............................................................... (Implementing Safety Co-ordinator)
at ...................................................(time) on ........................................................ (Date)

PART 2

2.1 CANCELLATION

I have received confirmation from ________________________________ (name of the Requesting Safety Co-ordinator) at ____________________________ (location) that the Safety Precautions set out in paragraph 1.2 are no longer required and accordingly the RISSP is cancelled.

Signed ............................................................... (Implementing Safety Co-ordinator)
at ...................................................(time) on ........................................................ (Date)

(Note: This form to be of a different colour from RISSP-R)
RISSP ISSUE PROCESS

Work required across boundary or inadvertent connection or potential connection

RSC contacts ISC & each confirms authority to act pursuant to OC8A

RSC and ISC agree location of Safety Precautions

Log

OC8A.5.1 or OC8A.7

If unable to agree Safety Precautions follow:

OC8A.5.1.4

ISC establishes isolation on his System

OC8A.5.2.1

If reqd, provide isolation on other Systems

OC8A.5.1.2

ISC confirms isolation is established to RSC

Log

OC8A.5.2.2

All isolation by RSC and ISC completed

OC8A.5.2.3 & OC8A.5.3.3

ISC initiates establishment of earthing (if agreed)

OC8A.5.3.1

If reqd, provide earthing on other Systems

OC8A.5.1.2

ISC confirms earthing is established to RSC

Log

OC8A.5.3.2 & OC8A.5.3.3

RISSP process completed for work on one side of the Connection Point

OC8A.5.4.1

If work is required to both sides of the Connection Point, each party takes the role of RSC for the work on his side & separate RISSPs are required

OC8A.5.4.2 or OC8A.7

ISC completes RISSP-I
Details exchanged
RSC completes RISSP-R

OC8A.5.4.1 to OC8A.5.4.6

RSC can now authorise the work

OC8A.5.4.7

RISSP cancellation process
OC8A Appendix C3

OC8A - 19

See Appendix OC8A C2

OC8A.6

24 June 2008
Where testing affects another Safety Co-ordinator’s System

Testing will not take place by RSC until:-

OC8A.6.1

ISC confirms that no person is working or testing or authorised to, on his System or another System within the points of Isolation on the RISSP

Log

OC8A.6.1(a)(i)

Any RISSP other than for the proposed test shall be cancelled

OC8A.6.1(b)

The ISC agrees to the testing between the points of Isolation on the RISSP and the RSC System

OC8A.6.1(c)

Test can now take place

When test is complete or cancelled. RSC informs ISC

Log

OC8A.6.2(a)

If testing required the removal of earthing the RISSP process is as set out in:-

OC8A.6.2(b)

Earthing reapplied

OC8A.6.2(b)

RISSP can stay in force, if required

Earthing not reapplied

OC8A.6.2(b)

RISSP cancellation process. See OC8A Appendix C3
RISSP CANCELLATION PROCESS

Appendix C3

Requesting Safety Co-ordinator (RSC)
Person requiring Safety Precaution from another User

Implementing Safety Co-ordinator (ISC)
Person who co-ordinates provision of Safety Precautions

Work/Testing completed or cancelled

RSC contacts ISC to inform safety precautions are no longer required

RSC informs ISC of RISSP document to be cancelled (including identity numbers)

The RSC and ISC complete their respective parts of section 2.1 on RISSP-R and RISSP-I

The RSC and ISC exchange the details including respective names, times and date

RISSP is now cancelled

Agree removal of Safety Precautions

Removal of earthing during testing across the Connection Point is as set out in:-

Agreed between RSC and ISC that all earths are removed

Removal of isolation agreed between RSC and ISC

OC8A process complete

Removal being an internal matter for the party the ISC represents

OC8A.5.5.4

OC8A.5.5.4

OC8A.5.5.5

OC8A.6.2(b)
Requesting Safety Co-ordinator (RSC)
Person requiring Safety Precaution from another User

Implementing Safety Co-ordinator (ISC)
Person who co-ordinates provision of Safety Precautions

Proximity
Nearness or Closeness to HV Equipment

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RSC contacts ISC & each confirms authority to act pursuant to OC8A

RSC and ISC agree location of Safety Precautions

Log
OC8A.8.1.1

 ISC establishes Isolation (and Earthing if required) on his System

Log
OC8A.8.2.1

ISC confirms Isolation (and Earthing) is established to RSC

ISC consents to the Permit for Work for proximity work

OC8A.8.3.2

ISC informs RSC of the Permit for Work for proximity work identifying number

OC8A.8.3.2

Site representative of ISC issues Permit for Work for proximity work to site representative of RSC

OC8A.8.3.3

RSC can now authorise the work

OC8A.8.3.4

On completion of work RSC contacts ISC to agree Permit for Work for proximity work can be cancelled

OC8A.8.4.1

Site representative of ISC cancels Permit for Work for proximity work

OC8A.8.4.2

ISC may remove Safety Precautions

OC8A.8.4.3

OC8A process complete
## National Grid Safety Circular (NGSC)

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</table>

<table>
<thead>
<tr>
<th>RISSP prefixes - Issue x</th>
<th>Date: Issued By:</th>
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## Example

Pursuant to the objectives of The Grid Code, Operating Code 8A1 - Safety Co-ordination, this circular will be used in relation to all cross boundary safety management issues with the **Relevant E&W Transmission Licensee** customers. Of particular note will be the agreed prefixes for the Record of Inter System Safety Precautions (RISSP) documents.
PERMIT FOR WORK

1. Location

   Equipment Identification

   Work to be done

2. Precautions taken to achieve Safety from the System
   Points of Isolation

   Primary Earths

   Actions taken to avoid Danger by draining, venting, purging and containment or dissipation of stored energy*

   Further precautions to be taken during the course of the work to avoid System derived hazards*

3. Precautions that may be varied*

4. Preparation

   Control Person(s) (Safety) giving Consent

   State whether this Permit for Work must be personally retained yes no

   Signed

   Senior Authorised Person

5. Issue & Receipt

   Key Safe Number*

   Safety Keys (No. off)*

   Earthing Schedule Number*

   Portable Drain earths (No. off)*

   Recommendations for General Safety Report Number*

   Approved (ROMP)#/Card Safe#/ Procedure Number*

   Circuit Identification – Colours/ Symbols*

   Flags (No. off)*

   Wristlets (No. off)*

   Issued (Signed)

   Senior Authorised Person

   Received (Signed)

   Time

   Date

   Competent Person

   Name (Block letters)

   Company

   # delete as appropriate  *write N/A if not applicable February 1995

< End of OC8A >
SAFETY CO-ORDINATION IN RESPECT OF THE SCOTTISH TRANSMISSION SYSTEMS
OR THE SYSTEMS OF SCOTTISH USERS

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SAFETY CO-ORDINATION ON SCOTTISH TRANSMISSION SYSTEMS

OC8B.1 INTRODUCTION

OC8B specifies the standard procedures to be used by NGET, the Relevant Scottish Transmission Licensees and Scottish Users for the co-ordination, establishment and maintenance of necessary Safety Precautions when work is to be carried out on or near the Scottish Transmission System or the System of a Scottish User and when there is a need for Safety Precautions on HV Apparatus on the other's System for this work to be carried out safely. OC8B applies to Relevant Scottish Transmission Licensees and Scottish Users. Where work is to be carried out on or near equipment on an E&W Transmission System or the Systems of E&W Users, but such work requires Safety Precautions to be established on a Scottish Transmission System or the Systems of Scottish Users, OC8B should be followed by the Relevant Scottish Transmission Licensee and Scottish Users to establish the required Safety Precautions.

OC8A specifies the procedures to be used by the Relevant E&W Transmission Licensee and E&W Users.

NGET shall procure that Relevant Scottish Transmission Licensees shall comply with OC8B where and to the extent that such section applies to them.

In this OC8B the term “work” includes testing, other than System Tests which are covered by OC12.

OC8B.1.2 OC8B also covers the co-ordination, establishment and maintenance of necessary safety precautions on the Implementing Safety Co-ordinator's System when work is to be carried out at a Scottish User's Site or a Transmission Site (as the case may be) on equipment of the Scottish User or the Relevant Scottish Transmission Licensee as the case may be where the work or equipment is near to HV Apparatus on the Implementing Safety Co-ordinator's System.

OC8B.1.3 OC8B does not apply to the situation where Safety Precautions need to be agreed solely between Scottish Users. OC8B does not apply to the situation where Safety Precautions need to be agreed solely between Transmission Licensees.

OC8B.1.4 OC8B does not seek to impose a particular set of Safety Rules on Relevant Scottish Transmission Licensees and Scottish Users. The Safety Rules to be adopted and used by the Relevant Scottish Transmission Licensee and each Scottish User shall be those chosen by each.

OC8B.1.5 Site Responsibility Schedules document the control responsibility for each item of Plant and Apparatus for each site.

OC8B.1.6 (a) The Relevant Scottish Transmission Licensee may agree alternative site-specific operational procedures with Scottish Users for the co-ordination,
establishment and maintenance of **Safety Precautions** instead of the **Record of Inter-System Safety Precautions (“RISSP”)** procedure detailed in this **OC8B**. Such operational procedures shall satisfy the requirements of paragraphs **OC8B.1.7**, **OC8B.2.1**, **OC8B.4.1**, **OC8B.4.2**, **OC8B.9**, **OC8B.10**. These alternative site-specific operational procedures for the co-ordination, establishment and maintenance of **Safety Precautions** will be referenced in the relevant **Site Responsibility Schedule**.

(b) The **Relevant Scottish Transmission Licensee** may agree with **Scottish Users** site-specific procedures for the application of **Safety Precautions** across the interface between **Relevant Scottish Transmission Licensee** and **Scottish User** in addition to and consistent with either the **RISSP** procedure or the alternative site-specific operational procedures described in **OC8B.1.6 (a)**. These site-specific procedures will be referenced in the relevant **Site Responsibility Schedule**.

(c) The **Relevant Scottish Transmission Licensee** and the **Scottish User** shall comply with the procedures agreed pursuant to **OC8B.1.6 (a)** and **OC8B.1.6 (b)**.

**OC8B.1.7 Defined terms**

**OC8B.1.7.1** **Scottish Users** should bear in mind that in **OC8** only, in order that **OC8** reads more easily with the terminology used in certain **Safety Rules**, the term **“HV Apparatus”** is defined more restrictively and is used accordingly in **OC8B**. **Scottish Users** should, therefore, exercise caution in relation to this term when reading and using **OC8B**.

**OC8B.1.7.2** In **OC8** only the following terms shall have the following meanings:

1. **"HV Apparatus"** means **High Voltage** electrical circuits forming part of a **System**, on which **Safety From The System** may be required or on which **Safety Precautions** may be applied to allow work to be carried out on a **System**.

2. **"Isolation"** means the disconnection of **Apparatus** from the remainder of the **System** in which that **Apparatus** is situated by either of the following:

   a. an **Isolating Device** maintained in an isolating position. The isolating position must either be:

      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 given to the authorised site representative of the **Requesting Safety Co-ordinator** where reasonably practicable 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

      ii. maintained and/or secured by such other method which must be in accordance with the **Safety Rules** of the **Relevant Scottish Transmission Licensee** or that **Scottish User**, as the case may be; or
(b) an adequate physical separation which must be in accordance with, and maintained by, the method set out in the Safety Rules of the Relevant Scottish Transmission Licensee or that Scottish User, as the case may be, and, if it is a part of that method, a Caution Notice must be placed at the point of separation; or

(c) in the case where the relevant HV Apparatus of the Implementing Safety Co-ordinator is being either constructed or modified, an adequate physical separation as a result of a No System Connection.

(3) “No System Connection” means an adequate physical separation (which must be in accordance with, and maintained by, the method set out in the Safety Rules of the Implementing Safety Co-ordinator) of the Implementing Safety Co-ordinator’s HV Apparatus from the rest of the Implementing Safety Co-ordinator’s System where such HV Apparatus has no installed means of being connected to, and will not for the duration of the Safety Precaution be connected to, a source of electrical energy or to any other part of the Implementing Safety Co-ordinator’s System.

(4) “Earthing” means a way of providing a connection between conductors and earth by an Earthing Device which is either:

(i) 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 given to the authorised site representative of the Requesting Safety Co-ordinator where reasonably practicable 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

(iii) maintained and/or secured in position by such other method which must be in accordance with the Safety Rules of the Relevant Scottish Transmission Licensee or that Scottish User as the case may be.

OC8B.1.7.3 For the purpose of the co-ordination of safety relating to HV Apparatus the term “Safety Precautions” means Isolation and/or Earthing.

OC8B.2 OBJECTIVE

OC8B.2.1 The objective of OC8B is to achieve:-

(i) Safety From The System when work on or near a System necessitates the provision of Safety Precautions on another System on HV Apparatus up to a Connection Point; and

(ii) Safety From The System when work is to be carried out at a Scottish User’s Site or a Transmission Site (as the case may be) on equipment of the Scottish User or the Relevant Scottish Transmission Licensee (as the case may be) where the work or equipment is near to HV Apparatus on the Implementing Safety Co-ordinator’s System.
A flow chart, set out in OC8B Appendix C, illustrates the process utilised in OC8B to achieve the objective set out in OC8B.2.1. In the case of a conflict between the flow chart and the provisions of the written text of OC8B, the written text will prevail.

SCOPE

OC8B applies to NGT, Relevant Scottish Transmission Licensees and to Scottish Users, which in OC8 means:-

(a) Generators;

(b) Network Operators; and

(c) Non-Embedded Customers.

The procedures for the establishment of safety co-ordination by NGT in relation to External Interconnections are set out in Interconnection Agreements with relevant persons for the External Interconnections.

PROCEDURE

Approval of Safety Rules

(a) In accordance with the timing requirements of its Bilateral Agreement, each Scottish User will supply to the Relevant Scottish Transmission Licensee a copy of its Safety Rules relating to its side of the Connection Point at each Connection Site.

(b) In accordance with the timing requirements of each Bilateral Agreement the Relevant Scottish Transmission Licensee will supply to each Scottish User a copy of its Safety Rules relating to the Transmission side of the Connection Point at each Connection Site.

(c) Prior to connection the Relevant Scottish Transmission Licensee and the Scottish User must have approved each other's relevant Safety Rules in relation to Isolation and Earthing.

Either party may require that the Isolation and/or Earthing provisions in the other party's Safety Rules affecting the Connection Site should be made more stringent in order that approval of the other party's Safety Rules can be given. Provided these requirements are not unreasonable, the other party will make such changes as soon as reasonably practicable. These changes may need to cover the application of Isolation and/or Earthing at a place remote from the Connection Site, depending upon the System layout. Approval may not be withheld because the party required to approve reasonably believes the provisions relating to Isolation and/or Earthing are too stringent.

If, following approval, a party wishes to change the provisions in its Safety Rules relating to Isolation and/or Earthing, it must inform the other party. If the change is to make the provisions more stringent, then the other party merely has to note the changes. If the change is to make the provisions less stringent, then the other party
needs to approve the new provisions and the procedures referred to in OC8B.4.1.2 apply.

OC8B.4.2 **Safety Co-ordinators**

OC8B.4.2.1 For each **Connection Point**, the Relevant Scottish Transmission Licensee and each **Scottish User** will have nominated to be available, to a timescale agreed in the **Bilateral Agreement**, a person or persons ("**Safety Co-ordinator(s)**") to be responsible for the co-ordination of **Safety Precautions** when work is to be carried out on a **System** which necessitates the provision of **Safety Precautions** on **HV Apparatus** pursuant to OC8B. A **Safety Co-ordinator** may be responsible for the co-ordination of safety on **HV Apparatus** at more than one **Connection Point**.

OC8B.4.2.2 Each **Safety Co-ordinator** shall be authorised by the Relevant Scottish Transmission Licensee or a Scottish User, as the case may be, as competent to carry out the functions set out in OC8B to achieve **Safety From The System**. Confirmation from the Relevant Scottish Transmission Licensee or a Scottish User, as the case may be, that its Safety Co-ordinator(s) as a group are so authorised is dealt with, for Scottish Users, in CC.5.2 and for Relevant Scottish Transmission Licensees in the STC. Only persons with such authorisation will carry out the provisions of OC8B. Each User shall, prior to being connected to the National Electricity Transmission System, give notice in writing to the Relevant Scottish Transmission Licensee of its Safety Co-ordinator(s) and will update the written notice yearly and whenever there is a change to the identity of its Safety Co-ordinators or to the Connection Points. The Relevant Scottish Transmission Licensee will, at the time of a Scottish User being connected to the National Electricity Transmission System give notice in writing to that Scottish User of the identity of its Safety Co-ordinator(s) and will update the written notice whenever there is a change to the Connection Points or Safety Co-ordinators.

OC8B.4.2.3 Contact between Safety Co-ordinators will be made via normal operational channels, and accordingly separate telephone numbers for Safety Co-ordinators need not be provided.

OC8B.4.2.4 If work is to be carried out on a System, or on equipment of the Relevant Scottish Transmission Licensee or a Scottish User near to a System, as provided in this OC8B, which necessitates the provision of Safety Precautions on HV Apparatus in accordance with the provisions of OC8B, the Requesting Safety Co-ordinator who requires the Safety Precautions to be provided shall contact the relevant Implementing Safety Co-ordinator to co-ordinate the establishment of the Safety Precautions.

OC8B.4.3 **RISSP**

OC8B.4.3.1 OC8B sets out the procedures for utilising the RISSP, which will be used except where dealing with equipment in proximity to the other’s System as provided in OC8B.8. Sections OC8B.4 to OC8B.7 inclusive should be read accordingly.

OC8B.4.3.2 The Revant Transmission Licensee will use the format of the RISSP forms set out in Appendix A and Appendix B to OC8B, or any other format which may be agreed between the Relevant Scottish Transmission Licensee and each User. That set out in OC8B Appendix A and designated as “RISSP-R”, shall be used when the Relevant Scottish Transmission Licensee is the Requesting Safety Co-
ordinator, and that in OC8B Appendix B and designated as "RISSP-I", shall be used when the Relevant Transmission Licensee is the Implementing Safety Co-ordinator. Proformas of RISSP-R and RISSP-I will be provided for use by Relevant Scottish Transmission Licensees staff.

OC8B.4.3.3 Scottish Users may either adopt the format referred to in OC8B.4.3.2 or any other format which may be agreed between the Relevant Scottish Transmission Licensee and the Scottish User from time to time.

OC8B.4.3.4 All references to RISSP-R and RISSP-I shall be taken as referring to the corresponding parts of the alternative forms or other tangible written or electronic records used by each Scottish User or Relevant Scottish Transmission Licensee.

OC8B.4.3.5 RISSP-R will have an identifying number written or printed on it, comprising a prefix which identifies the location at which it is issued, and a unique (for each Scottish User or Relevant Scottish Transmission Licensee, as the case may be) serial number consisting of four digits and the suffix "R".

OC8B.4.3.6 (a) In accordance with the timing requirements set out in the Bilateral Agreement each Scottish User shall apply in writing to Relevant Scottish Transmission Licensee for Relevant Scottish Transmission Licensee’s approval of its proposed prefix.

(b) Relevant Scottish Transmission Licensee shall consider the proposed prefix to see if it is the same as (or confusingly similar to) a prefix used by Relevant Scottish Transmission Licensee or another User and shall, as soon as possible (and in any event within ten days), respond in writing to the Scottish User with its approval or disapproval.

(c) If Relevant Scottish Transmission Licensee disapproves, it shall explain in its response why it has disapproved and will suggest an alternative prefix.

(d) If Relevant Scottish Transmission Licensee has disapproved, then the Scottish User shall either notify Relevant Scottish Transmission Licensee in writing of its acceptance of the suggested alternative prefix or it shall apply in writing to Relevant Scottish Transmission Licensee with revised proposals and the above procedure shall apply to that application.

OC8B.5 SAFETY PRECAUTIONS ON HV APPARATUS

OC8B.5.1 Agreement of Safety Precautions

OC8B.5.1.1 The Requesting Safety Co-ordinator who requires Safety Precautions on another System(s) will contact the relevant Implementing Safety Co-ordinator(s) to agree the Location of the Safety Precautions to be established. This agreement will be recorded in the respective Safety Logs.

OC8B.5.1.2 It is the responsibility of the Implementing Safety Co-ordinator to ensure that adequate Safety Precautions are established and maintained, on his and/or another System connected to his System, to enable Safety From The System to be achieved on the HV Apparatus, specified by the Requesting Safety Co-ordinator which is to be identified in Part 1.1 of the RISSP. Reference to another System in
this OC8B.5.1.2 shall not include the Requesting Safety Co-ordinator's System which is dealt with in OC8B.5.1.3.

OC8B.5.1.3 When the Implementing Safety Co-ordinator is of the reasonable opinion that it is necessary for Safety Precautions on the System of the Requesting Safety Co-ordinator, other than on the HV Apparatus specified by the Requesting Safety Co-ordinator, which is to be identified in Part 1.1 of the RISSP, he shall contact the Requesting Safety Co-ordinator and the details shall be recorded in part 1.1 of the RISSP forms. In these circumstances it is the responsibility of the Requesting Safety Co-ordinator to establish and maintain such Safety Precautions.

OC8B.5.1.4 The location of the Safety Precautions should be indicated on each Scottish User's operational diagram and labelled as per the local instructions of each Scottish User.

In the event of disagreement

In any case where the Requesting Safety Co-ordinator and the Implementing Safety Co-ordinator are unable to agree the Location of the Isolation and (if requested) Earthing, both shall be at the closest available points on the infeeds to the HV Apparatus on which Safety From The System is to be achieved as indicated on the Operation Diagram.

OC8B.5.2 Implementation of Isolation

OC8B.5.2.1 Following the agreement of the Safety Precautions in accordance with OC8B.5.1 the Implementing Safety Co-ordinator shall then establish the agreed Isolation.

OC8B.5.2.2 The Implementing Safety Co-ordinator shall confirm to the Requesting Safety Co-ordinator that the agreed Isolation has been established, and identify the Requesting Safety Co-ordinator's HV Apparatus up to the Connection Point, for which the Isolation has been provided. The confirmation shall specify:

(a) for each Location, the identity (by means of HV Apparatus name, nomenclature and numbering or position, as applicable) of each point of Isolation;

(b) whether Isolation has been achieved by an Isolating Device in the isolating position, by an adequate physical separation or as a result of a No System Connection;

(c) where an Isolating Device has been used whether the isolating position is either:

(i) maintained by immobilising and Locking the Isolating Device in the isolating position and affixing a Caution Notice to it. Where the Isolating Device has been Locked with a Safety Key, the confirmation shall specify that the Safety Key has been secured in a Key Safe and the Key Safe Key has been given to the authorised site representative of the Requesting Safety Co-ordinator where reasonably practicable and is to be retained in safe custody. Where not reasonably practicable (including where Earthing has been requested in OC8B.5.1), the confirmation shall specify that the Key Safe Key will be retained by the authorised site.
representative of the Implementing Safety Co-ordinator in safe custody; or

(ii) maintained and/or secured by such other method which must be in accordance with the Safety Rules of the Relevant Scottish Transmission Licensee or that Scottish User, as the case may be; and

(d) where an adequate physical separation has been used that it will be in accordance with, and maintained by, the method set out in the Safety Rules of the Relevant Scottish Transmission Licensee or that Scottish User, as the case may be, and, if it is a part of that method, that a Caution Notice has been placed at the point of separation;

(e) where a No System Connection has been used the physical position of the No System Connection shall be defined and shall not be varied for the duration of the Safety Precaution and the Implementing Safety Co-ordinator’s relevant HV Apparatus will not, for the duration of the Safety Precaution be connected to a source of electrical energy or to any any other part of the Implementing Safety Co-ordinator’s System.

The confirmation of Isolation shall be recorded in the respective Safety Logs.

OC8B.5.2.3 Following the confirmation of Isolation being established by the Implementing Safety Co-ordinator and the necessary establishment of relevant Isolation on the Requesting Safety Co-ordinators System, the Requesting Safety Co-ordinator will then request the implementation of Earthing by the Implementing Safety Co-ordinator, if agreed in section OC8B.5.1. If the implementation of Earthing has been agreed, then the authorised site representative of the Implementing Safety Co-ordinator shall retain any Key Safe Key in safe custody until any Safety Key used for Earthing has been secured in the Key Safe.

OC8B.5.3 Implementation of Earthing

OC8B.5.3.1 The Implementing Safety Co-ordinator shall then establish the agreed Earthing.

OC8B.5.3.2 The Implementing Safety Co-ordinator shall confirm to the Requesting Safety Co-ordinator that the agreed Earthing has been established, and identify the Requesting Safety Co-ordinator’s HV Apparatus up to the Connection Point, for which the Earthing has been provided. The confirmation shall specify:

(a) for each Location, the identity (by means of HV Apparatus name, nomenclature and numbering or position, as is applicable) of each point of Earthing; and

(b) in respect of the Earthing Device used, whether it is:

(i) immobilised and Locked in the earthing position. Where the Earthing Device has been Locked with a Safety Key, that the Safety Key has been secured in a Key Safe and the Key Safe Key has been given to the authorised site representative of the Requesting Safety Co-ordinator where reasonably practicable and is to be retained in safe custody. Where not reasonably practicable, that the Key Safe Key will be retained
by the authorised site representative of the **Implementing Safety Co-ordinator** in safe custody; or

(ii) maintained and/or secured in position by such other method which is in accordance with the **Safety Rules** of the **Relevant Scottish Transmission Licensee** or that **Scottish User**, as the case may be.

The confirmation of **Earthing** shall be recorded in the respective **Safety Logs**.

**OC8B.5.3.3.** The **Implementing Safety Co-ordinator** shall ensure that the established **Safety Precautions** are maintained until requested to be removed by the relevant **Requesting Safety Co-ordinator**.

**OC8B.5.4** **RISSP Issue Procedure**

**OC8B.5.4.1** Where **Safety Precautions** on another **System(s)** are being provided to enable work on the **Requesting Safety Co-ordinator’s System**, before any work commences they must be recorded by a **RISSP** being issued. The **RISSP** is applicable to **HV Apparatus** up to the **Connection Point** identified in section 1.1 of the **RISSP-R** and **RISSP-I** forms.

**OC8B.5.4.2** Where **Safety Precautions** are being provided to enable work to be carried out on both sides of the **Connection Point** a **RISSP** will need to be issued for each side of the **Connection Point** with **Relevant Scottish Transmission Licensee** and the respective **User** each enacting the role of **Requesting Safety Co-ordinator**. This will result in a **RISSP-R** and a **RISSP-I** form being completed by each of the **Relevant Scottish Transmission Licensee** and the **Scottish User**, with each **Requesting Safety Co-ordinator** issuing a separate **RISSP** number.

**OC8B.5.4.3** Once the **Safety Precautions** have been established (in accordance with **OC8B.5.2** and **OC8B.5.3**), the **Implementing Safety Co-ordinator** shall complete parts 1.1 and 1.2 of a **RISSP-I** form recording the details specified in **OC8B.5.1.3**, **OC8B.5.2.2** and **OC8B.5.3.2**. Where **Earthing** has not been requested, Part 1.2(b) will be completed with the words “not applicable” or “N/A”. He shall then contact the **Requesting Safety Co-ordinator** to pass on these details.

**OC8B.5.4.4** The **Requesting Safety Co-ordinator** shall complete Parts 1.1 and 1.2 of the **RISSP-R**, making a precise copy of the details received. On completion, the **Requesting Safety Co-ordinator** shall read the entries made back to the sender and check that an accurate copy has been made.

**OC8B.5.4.5** The **Requesting Safety Co-ordinator** shall then issue the number of the **RISSP**, taken from the **RISSP-R**, to the **Implementing Safety Co-ordinator** who will ensure that the number, including the prefix and suffix (where applicable), is accurately recorded in the designated space on the **RISSP-I** form.

**OC8B.5.4.6** The **Requesting Safety Co-ordinator** and the **Implementing Safety Co-ordinator** shall complete and sign Part 1.3 of the **RISSP-R** and **RISSP-I** respectively and then enter the time and date. When signed no alteration to the **RISSP** is permitted; the **RISSP** may only be cancelled.

**OC8B.5.4.7** The **Requesting Safety Co-ordinator** is then free to authorise work, but not testing, in accordance with the requirements of the relevant internal safety procedures which
apply to the Requesting Safety Co-ordinator’s System. This is likely to involve the issue of safety documents or other relevant internal authorisations. Where testing is to be carried out, the procedure set out below in OC8B.6 shall be implemented.

OC8B.5.5  RISSP Cancellation Procedure

OC8B.5.5.1 When the Requesting Safety Co-ordinator decides that Safety Precautions are no longer required, he will contact the relevant Implementing Safety Co-ordinator to effect cancellation of the associated RISSP.

OC8B.5.5.2 The Requesting Safety Co-ordinator will inform the relevant Implementing Safety Co-ordinator of the RISSP identifying number, including the prefix and suffix (where applicable), and agree it is the RISSP to be cancelled.

OC8B.5.5.3 The Requesting Safety Co-ordinator and the relevant Implementing Safety Co-ordinator shall then respectively complete Part 2.1 of their respective RISSP-R and RISSP-I forms and shall then exchange details. The details being exchanged shall include their respective names and time and date. On completion of the exchange of details the respective RISSP is cancelled. The removal of Safety Precautions is as set out in OC8B.5.5.4 and OC8B.5.5.5.

OC8B.5.5.4 Neither Safety Co-ordinator shall instruct the removal of any Isolation forming part of the Safety Precautions as part of the returning of the HV Apparatus to service until it is confirmed to each by each other that every earth on each side of the Connection Point, within the points of isolation identified on the RISSP, has been removed or disconnected by the provision of additional Points of Isolation.

OC8B.5.5.5 Subject to the provisions in OC8B.5.5.4, the Implementing Safety Co-ordinator is then free to arrange the removal of the Safety Precautions, the procedure to achieve that being entirely an internal matter for the party the Implementing Safety Co-ordinator is representing. Where a Key Safe Key has been given to the authorised site representative of the Requesting Safety Co-ordinator, the Key Safe Key must be returned to the authorised site representative of the Implementing Safety Co-ordinator. The only situation in which any Safety Precautions may be removed without first cancelling the RISSP in accordance with OC8B.5.5 or OC8B.5.6 is when Earthing is removed in the situation envisaged in OC8B.6.2(b).

OC8B.5.6  RISSP Change Control

Nothing in this OC8B prevents Relevant Scottish Transmission Licensee and Scottish Users agreeing to a simultaneous cancellation and issue of a new RISSP, if both agree. It should be noted, however, that the effect of that under the relevant Safety Rules is not a matter with which the Grid Code deals.

OC8B.6  TESTING

OC8B.6.1 The carrying out of the test may affect Safety Precautions on RISSPs or work being carried out which does not require a RISSP. Testing can, for example, include the application of an independent test voltage. Accordingly, where the Requesting Safety Co-ordinator wishes to authorise the carrying out of such a test to which the procedures in OC8B.6 apply he may not do so and the test will not take place unless
and until the steps in (a)-(c) below have been followed and confirmation of completion has been recorded in the respective Safety Logs:

(a) confirmation must be obtained from the Implementing Safety Co-ordinator that:
   
   (i) no person is working on, or testing, or has been authorised to work on, or test, any part of its System or another System(s) (other than the System of the Requesting Safety Co-ordinator) within the points of Isolation identified on the RISSP form relating to the test which is proposed to be undertaken, and
   
   (ii) no person will be so authorised until the proposed test has been completed (or cancelled) and the Requesting Safety Co-ordinator has notified the Implementing Safety Co-ordinator of its completion (or cancellation);

(b) any other current RISSPs which relate to the parts of the System in which the testing is to take place must have been cancelled in accordance with procedures set out in OC8B.5.5;

(c) the Implementing Safety Co-ordinator must agree with the Requesting Safety Co-ordinator to permit the testing on that part of the System between the points of Isolation identified in the RISSP associated with the test and the points of Isolation on the Requesting Safety Co-ordinator’s System.

OC8B.6.2 (a) The Requesting Safety Co-ordinator will inform the Implementing Safety Co-ordinator as soon as the test has been completed or cancelled and the confirmation shall be recorded in the respective Safety Logs.

(b) When the test gives rise to the removal of Earthing which it is not intended to re-apply, the relevant RISSP associated with the test shall be cancelled at the completion or cancellation of the test in accordance with the procedure set out in either OC8B.5.5 or OC8B.5.6. Where the Earthing is re-applied following the completion or cancellation of the test, there is no requirement to cancel the relevant RISSP associated with the test pursuant to this OC8B.6.2.

OC8B.7 EMERGENCY SITUATIONS

OC8B.7.1 There may be circumstances where Safety Precautions need to be established in relation to an unintended electrical connection or situations where there is an unintended risk of electrical connection between the National Electricity Transmission System and a Scottish User’s System, for example resulting from an incident where one line becomes attached or unacceptably close to another.

OC8B.7.2 In those circumstances, if both the Relevant Scottish Transmission Licensee the Scottish User agree, the relevant provisions of OC8B.5 will apply as if the electrical connections or potential connections were, solely for the purposes of this OC8B, a Connection Point.

OC8B.7.3 (a) The relevant Safety Co-ordinator shall be that for the electrically closest existing Connection Point to that Scottish User’s System or such other local
Connection Point as may be agreed between the Relevant Scottish Transmission Licensee and the Scottish User, with discussions taking place between the relevant local Safety Co-ordinators. The Connection Point to be used shall be known in this OC8B.7.3 as the "relevant Connection Point".

(c) The Safety Rules shall be those which apply to the relevant Connection Point.

(c) The prefix for the RISSP (where applicable) will be that which applies for the relevant Connection Point.

OC8B.8 SAFETY PRECAUTIONS RELATING TO WORKING ON EQUIPMENT NEAR TO THE HV SYSTEM

OC8B.8 applies to the situation where work is to be carried out at a Scottish User's Site or a Transmission Site (as the case may be) on equipment of the Scottish User or a Relevant Scottish Transmission Licensee as the case may be, where the work or equipment is near to HV Apparatus on the Implementing Safety Co-ordinator's System. It does not apply to other situations to which OC8B applies. In this part of OC8B, a Permit for Work for proximity work is to be used, rather than the usual RISSP procedure, given the nature and effect of the work, all as further provided in the OC8B.8.

OC8B.8.1 Agreement of Safety Precautions

OC8B.8.1.1 The Requesting Safety Co-ordinator who requires Safety Precautions on another System(s) when work is to be carried out at a Scottish User's Site or a Transmission Site (as the case may be) on equipment of the Scottish User or a Relevant Scottish Transmission Licensee, as the case may be, where the work or equipment is near to HV Apparatus on the Implementing Safety Co-ordinator's System will contact the relevant Implementing Safety Co-ordinator(s) to agree the Location of the Safety Precautions to be established, having as part of this process informed the Implementing Safety Co-ordinator of the equipment and the work to be undertaken. The respective Safety Co-ordinators will ensure that they discuss the request with their authorised site representative and that the respective authorised site representatives discuss the request at the Connection Site. This agreement will be recorded in the respective Safety Logs.

OC8B.8.1.2 It is the responsibility of the Implementing Safety Co-ordinator, working with his authorised site representative as appropriate, to ensure that adequate Safety Precautions are established and maintained, on his and/or another System connected to his System, to enable Safety From The System to be achieved for work to be carried out at a Scottish User's Site or a Transmission Site (as the case may be) on equipment and in relation to work which is to be identified in the relevant part of the Permit for Work for proximity work where the work or equipment is near to HV Apparatus of the Implementing Safety Co-ordinator's System specified by the Requesting Safety Co-ordinator. Reference to another System in this OC8B.8.1.2 shall not include the Requesting Safety Co-ordinator's System.
OC8B.8.1.3 In the event of disagreement

In any case where the Requesting Safety Co-ordinator and the Implementing Safety Co-ordinator are unable to agree the Location of the Isolation and (if requested) Earthing, both shall be at the closest available points on the infeeds to the HV Apparatus near to which the work is to be carried out as indicated on the Operation Diagram.

OC8B.8.2 Implementation of Isolation and Earthing

OC8B.8.2.1 Following the agreement of the Safety Precautions in accordance with OC8B.8.1 the Implementing Safety Co-ordinator shall then establish the agreed Isolation and (if required) Earthing.

OC8B.8.2.2 The Implementing Safety Co-ordinator shall confirm to the Requesting Safety Co-ordinator that the agreed Isolation and (if required) Earthing has been established.

OC8B.8.2.3 The Implementing Safety Co-ordinator shall ensure that the established Safety Precautions are maintained until requested to be removed by the relevant Requesting Safety Co-ordinator.

OC8B.8.3 Permit for Work for proximity work Issue Procedure

OC8B.8.3.1 Where Safety Precautions on another System(s) are being provided to enable work to be carried out at a Scottish User's Site or Transmission Site (as the case may be) on equipment where the work or equipment is in proximity to HV Apparatus of the Implementing Safety Co-ordinator, before any work commences they must be recorded by a Permit for Work for proximity work being issued. The Permit for Work for proximity work shall identify the Implementing Safety Co-ordinator's HV Apparatus in proximity to the required work.

OC8B.8.3.2 Once the Safety Precautions have been established (in accordance with OC8B.8.2), the Implementing Safety Co-ordinator shall agree to the issue of the Permit for Work for proximity work with the appropriately authorised site representative of the Requesting Safety Co-ordinator's Site. The Implementing Safety Co-ordinator will inform the Requesting Safety Co-ordinator of the Permit for Work for proximity work identifying number.

OC8B.8.3.3 The appropriately authorised site representative of the Implementing Safety Co-ordinator shall then issue the Permit for Work for proximity work to the appropriately authorised site representative of the Requesting Safety Co-ordinator. The Permit for Work for proximity work will in the section dealing with the work to be carried out, be completed to identify that the work is near the Implementing Safety Co-ordinator's HV Apparatus. No further details of the Requesting Safety Co-ordinator's work will be recorded, as that is a matter for the Requesting Safety Co-ordinator in relation to his work.

OC8B.8.3.4 The Requesting Safety Co-ordinator is then free to authorise work in accordance with the requirements of the relevant internal safety procedures which apply to the Requesting Safety Co-ordinator's Site. This is likely to involve the issue of safety documents or other relevant internal authorisations.

OC8B.8.4 Permit for Work for proximity work Cancellation Procedure
OC8B.8.4.1 When the Requesting Safety Co-ordinator decides that Safety Precautions are no longer required, he will contact the relevant Implementing Safety Co-ordinator to effect cancellation of the associated Permit for Work for proximity work.

OC8B.8.4.2 The Requesting Safety Co-ordinator will inform the relevant Implementing Safety Co-ordinator of the Permit for Work for proximity work identifying number, and agree that the Permit for Work for proximity work can be cancelled. The cancellation is then effected by the appropriately authorised site representative of the Requesting Safety Co-ordinator returning the Permit for Work for proximity work to the appropriately authorised site representative of the Implementing Safety Co-ordinator.

OC8B.8.4.3 The Implementing Safety Co-ordinator is then free to arrange the removal of the Safety Precautions, the procedure to achieve that being entirely an internal matter for the party the Implementing Safety Co-ordinator is representing.

OC8B.9 LOSS OF INTEGRITY OF SAFETY PRECAUTIONS

OC8B.9.1 In any instance when any Safety Precautions may be ineffective for any reason the relevant Safety Co-ordinator shall inform the other Safety Co-ordinator(s) without delay of that being the case and, if requested, of the reasons why.

OC8B.10 SAFETY LOG

OC8B.10.1 Relevant Scottish Transmission Licensees and Scottish Users shall maintain Safety Logs which shall be a chronological record of all messages relating to safety co-ordination under OC8 sent and received by the Safety Co-ordinator(s). The Safety Logs must be retained for a period of not less than six years.

RECORD OF INTER-SYSTEM SAFETY PRECAUTIONS (RISSP-R)
(.Requesting Safety Co-ordinator's Record)

RISSP NUMBER __________

Part 1

1.1 CIRCUIT IDENTIFICATION

Safety Precautions have been established by the Implementing Safety Co-ordinator to achieve Safety From The System on the following HV Apparatus:

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
1.2 SAFETY PRECAUTIONS ESTABLISHED

(a) ISOLATION

State the Locations(s) at which Isolation has been established on the Implementing Safety Co-ordinator's System. For each Location, identify each point of Isolation. For each point of Isolation state, the means by which the Isolation has been achieved, and whether, immobilised and Locked, Caution Notice affixed, other Safety Precautions applied, as appropriate.
(b) **EARTHING**

State the Locations(s) at which Earthing has been established on the Implementing Safety Co-ordinator's System. For each Location, identify each point of Earthing. For each point of Earthing state, the means by which the Earthing has been achieved, and whether, immobilised and Locked, other Safety Precautions applied, as appropriate.

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

1.3 **ISSUE**

I have received confirmation from ________________ (name of Implementing Safety Co-ordinator) at ________________ (Location) that the Safety Precautions identified in paragraph 1.2 have been established and that instructions will not be issued at his Location for their removal until this RISSP is cancelled.

Signed ................................................ (Requesting Safety Co-ordinator)
at ........................................ (time) on ....................................... (date)

**PART 2**

2.1 **CANCELLATION**

I have confirmed to ________________ (name of the Implementing Safety Co-ordinator) at ________________ (Location) that the Safety Precautions set out in paragraph 1.2 are no longer required and accordingly the RISSP is cancelled.

Signed ................................................... (Requesting Safety Co-ordinator)
at ........................................ (time) on ....................................... (date)
RECORD OF INTER-SYSTEM SAFETY PRECAUTIONS (RISSP-I)  
(Implementing Safety Co-ordinator’s Record)

RISSP NUMBER __________

PART 1

1.1 CIRCUIT IDENTIFICATION

Safety Precautions have been established by the Implementing Safety Co-ordinator to achieve Safety From The System on the following HV Apparatus:

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

1.2 SAFETY PRECAUTIONS ESTABLISHED

(a) ISOLATION

State the Location(s) at which isolation has been established on the Implementing Safety Co-ordinator's System. For each Location, identify each point of Isolation. For each point of Isolation state, the means by which the Isolation has been achieved, and whether, immobilised and Locked, Caution Notice affixed, other Safety Precautions applied, as appropriate.

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________ 
(b) **EARTHING**

State the Location(s) at which Earthing has been established on the Implementing Safety Co-ordinator's System. For each Location, identify each point of Earthing. For each point of Earthing state, the means by which the Earthing has been achieved, and whether, immobilised and Locked, other Safety Precautions applied, as appropriate.

________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

1.3 **ISSUE**

I confirmed to ____________________ (name of Requesting Safety Co-ordinator) at ____________________ (Location) that the Safety Precautions identified in paragraph 1.2 have been established and that instructions will not be issued at my Location for their removal until this RISSP is cancelled.

Signed .................................................. (Implementing Safety Co-ordinator)

at ......................... (time) on ......................... (date)

**PART 2**

2.1 **CANCELLATION**

I have received confirmation from ____________________ (name of the Requesting Safety Co-ordinator) at ____________________ (Location) that the Safety Precautions set out in paragraph 1.2 are no longer required and accordingly the RISSP is cancelled.

Signed .................................................. (Implementing Safety Co-ordinator)

at .............................. (time) on ................. (date)

(Note: This form to be of a different colour from RISSP-R.)
**RISSP ISSUE PROCESS**

**Requesting Safety Co-ordinator (RSC)**
Person requiring **Safety Precaution** from another **User**

**Implementing Safety Co-ordinator (ISC)**
Person who co-ordinates provision of **Safety Precautions**

---

1. **Work required across boundary or inadvertent connection or potential connection**
   - **RSC** contacts **ISC** & each confirms authority to act pursuant to OC8B

2. **RSC and ISC agree location of Safety Precautions**
   - Log
   - OC8B.5.1 or OC8B.7

3. **If unable to agree Safety Precautions follow**: OC8B.5.1.5

4. **ISC establishes isolation on his System**
   - Log
   - OC8B.5.2.1
   - OC8B.5.2.2
   - If reqd, provide isolation on other Systems

5. **ISC confirms isolation is established to RSC**
   - Log
   - OC8B.5.2.3 & OC8B.5.3.3

6. **ISC initiates establishment of earthing (if agreed)**
   - Log
   - OC8B.5.3.2 & OC8B.5.3.3

7. **ISC confirms earthing is established to RSC**
   - If reqd, provide earthing on other Systems

8. **All isolation by **RSC and ISC** completed**
   - OC8B.5.2.3 & OC8B.5.3.3

9. **ISC initiates establishment of earthing (if agreed)**
   - If reqd, provide earthing on other Systems

10. **ISC completes RISSP-I Details exchanged**
    - RSC completes RISSP-R
    - OC8B.5.4.1 to OC8B.5.4.6

11. **RSC can now authorise the work**
    - OC8B.5.4.7

12. **RISSP cancellation process**
    - OC8B Appendix C3

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**Issue 4  24 June 2008**

See OC8B Appendix C2
Where testing affects another Safety Co-ordinator’s System

Testing will not take place by RSC until:

OC8B.6.1

ISC confirms that no person is working or testing or authorised to, on his System or another System within the points of Isolation on the RISSP

OC8B.6.1(a)(i)

No person will be so authorised until proposed test is completed (or cancelled) by the RSC

OC8B.6.1(a)(ii)

Any RISSP other than for the proposed test shall be cancelled

OC8B.6.1(b)

The ISC agrees to the testing between the points of Isolation on the RISSP and the RSC System

OC8B.6.1(c)

Test can now take place

When test is complete or cancelled. RSC informs ISC

Log

OC8B.6.2(a)

If testing required the removal of earthing the RISSP process is as set out in:-

OC8B.6.2(b)

Earthing re-applied

OC8B.6.2(b)

Earthing not re-applied

OC8B.6.2(b)

RISSP cancellation process. See OC8B Appendix C3

RISSP can stay in force, if required

Requesting Safety Co-ordinator (RSC)
Person requiring Safety Precaution from another User

Implementing Safety Co-ordinator (ISC)
Person who co-ordinates provision of Safety Precautions

Continue from OC8B Appendix C1
RISSP CANCELLATION PROCESS

Requesting Safety Co-ordinator (RSC)
Person requiring Safety Precaution from another User

Implementing Safety Co-ordinator (ISC)
Person who co-ordinates provision of Safety Precautions

Work/Testing completed or cancelled

RSC contacts ISC to inform safety precautions are no longer required

RSC informs ISC of RISSP document to be cancelled (including identity numbers)

The RSC and ISC complete their respective parts of section 2.1 on RISSP-R and RISSP-I

The RSC and ISC exchange the details including respective names, times and date

RISSP is now cancelled

Agree removal of Safety Precautions

Agreed between RSC and ISC that all earths are removed

Removal of earthing during testing across the Connection Point is as set out in:

OC8B.6.2(b)

Removal of isolation agreed between RSC and ISC

Removal being an internal matter for the party the ISC represents

OC8B process complete
**PROCESS FOR WORKING NEAR TO SYSTEM EQUIPMENT**

**Requesting Safety Co-ordinator (RSC)**
Person requiring Safety Precaution from another User

**Implementing Safety Co-ordinator (ISC)**
Person who co-ordinates provision of Safety Precautions

**Proximity**
Nearness or Closeness to HV Equipment

---

**Work required on equipment near to HV Apparatus**

**RSC contacts ISC & each confirms authority to act pursuant to OC8B**

**RSC and ISC agree location of Safety Precautions**

- Log
  - OC8B.8.1.1

**If unable to agree Safety Precautions follow:**

- OC8B.8.1.3

**ISC establishes Isolation (and Earthing if required) on his System**

- Log
  - OC8B.8.2.1

**ISC confirms Isolation (and Earthing) is established to RSC**

- OC8B.8.2.2

**ISC consents to the Permit for Work for proximity work**

- OC8B.8.3.2

**ISC informs RSC of the Permit for Work for proximity work identifying number**

- OC8B.8.3.2

**Site representative of ISC issues Permit for Work for proximity work to site representative of RSC**

- OC8B.8.3.3

**RSC can now authorise the work**

- OC8B.8.3.4

**On completion of work RSC contacts ISC to agree Permit for Work for proximity work can be cancelled**

- OC8B.8.4.1

**Site representative of ISC cancels Permit for Work for proximity work**

- OC8B.8.4.2

**ISC may remove Safety Precautions**

- OC8B.8.4.3

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**OC8B process complete**
OC8B - Appendix D

Not Used
Scottish & Southern Energy plc

PERMIT-TO-WORK

1. ISSUE
To …………………………………………………………………………………………………………..

The following High Voltage Apparatus has been made safe in accordance with the Operational Safety Rules for the work detailed on this Permit-to-Work to proceed:

……………………………………………………………………………………..……………………………………….……..….
……………………………………………………………………………………..……………………………………….……..….
……………………………………………………………………………………..……………………………………….……..….

TREAT ALL OTHER APPARATUS AS LIVE

Circuit Main Earths are applied at: ………………………………………………………………………………………...
……………………………………………………………………………………..……………………………………….……..….
……………………………………………………………………………………..……………………………………….……..….
……………………………………………………………………………………..……………………………………….……..….

Other precautions (see Operational Safety Rules 3.2.1(b), 4.6.2(c) and 5.5.3), and any special instructions:
……………………………………………………………………………………..……………………………………….……..….
……………………………………………………………………………………..……………………………………….……..….
……………………………………………………………………………………..……………………………………….……..….

The following work is to be carried out: …………………………..……………………………………...……………………..
……………………………………………………………………………………..……………………………………….……..….
……………………………………………………………………………………..……………………………………….……..….
……………………………………………………………………………………..……………………………………….……..….

Circuit Indentification Issued: Colour …...………….  No. of wristlets …………… No. of step bolts …………..
Name: (print): ………………..…..…..   Signature: ………..…...………. Time: ……….………….. Date: …….……………..

2. RECEIPT

I accept responsibility for carrying out the work on the Apparatus detailed on this Permit-to-Work, applying additional earths as necessary. No attempt will be made by me, or by the persons under my charge, to work on any other Apparatus.

Name: (print): ………………..…..…..   Signature: ………..…...………. Time: ……….………….. Date: …….……………..
Circuit Indentification Equipment Checked as above (Initials): ……………………

3. CLEARANCE

All persons under my control have been withdrawn and warned that it is no longer safe to work on the Apparatus detailed on this Permit-to Work.

All gear, tools and additional earths have/have not* been removed. The works is/is not* complete.

All circuit identification equipment issued as above has been returned

Name: (print): ………………..…..…..   Signature: ………..…...………. Time: ……….………….. Date: …….……………..

* Delete where not applicable

4. CANCELLATION

This Permit-to-Work is cancelled.

Name: (print): ………………..…..…..   Signature: ………..…...………. Time: ……….………….. Date: …….……………..

OC8B APPENDIX E
Scottish Power

PERMIT FOR WORK

1. (i) LOCATION ………………………………………………………………………………………………………………………………..

(ii) PLANT/APPARATUS IDENTIFICATION ………………………………………………………………………………………………

(iii) WORK TO BE DONE …………………………………………………………………………………………………………………

2. (i) PRECAUTIONS TAKEN TO ACHIEVE SAFETY FROM THE SYSTEM: State points at which Plant/Apparatus has been isolated and specify position(s) of Earthing Devices applied. State actions taken to avoid Danger by draining, venting, purging and containment or dissipation of stored energy.

Caution Notices have been affixed to all points of isolation

(ii) FURTHER PRECAUTIONS TO BE TAKEN DURING THE COURSE OF WORK TO AVOID SYSTEM DERIVED HAZARDS

I have confirmed with the Control Person(s)* ……………………………………………………………………………………………

that precautions in Section 2(i) have been carried out and that the Control Person(s) will maintain these until this Permit for Work is cancelled. I certify that the precautions in Section 2(i) together with the precautions in Section 2(ii) are adequate to provide Safety from the System in respect of the work in Section 1.

This Permit for Work must only be transferred under the Personal Supervision of a Senior Authorised Person

Signed …………………………………………… being a Senior Authorised Person. Time: ……… Date: ………

3. ISSUE

(i) Key Safe Key (No.*) ……… (ii) Earthing Schedule* ……… (iii) Portable Drain Earths (No. off)* ………

(iv) Selected Person’s Report (No.*) …………… (v) Circuit Identification Flags (No. off)* ………

(vi) Circuit Identification Wristlets (No. off)* and Colours/Symbols ……………………………………………………

Signed …………………………………………… being the Senior Authorised Person responsible for the issue of this Permit for Work Time: ……… Date: ………

Issue 4

24 June 2008
4. RECEIPT

I understand and accept my responsibilities under the ScottishPower Safety Rules as recipient of this Permit for Work and acknowledge receipt of the items in Section 3.

Signed ........................................... Name (Block Letters) ...........................................................  
being a Competent Person in the employ of Firm/Dept ........................................... Time ........ Date ...........

TRANSFER RECORD

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<td>Date</td>
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<tr>
<td>Senior Authorised Person receiving suspended Document</td>
<td>†Person receiving reissued Document</td>
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<tr>
<td>Signature</td>
<td>Name (Block Letters)</td>
<td>Time Date</td>
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†Signature of Person receiving re-issued Document in accordance with conditions detailed in Section 4.

5. CLEARANCE: I certify that all persons working under this Permit for Work have been withdrawn from, and warned not to work on, the Plant/Apparatus in Section 1. All gears, tools, Drain Earths and loose material have been removed and guards and access doors have been replaced, except for:

………………………………………………………………………………………………………………………………………………
………………………………………………………………………………………………………………………………………………
………………………………………………………………………………………………………………………………………………

Signed ........................................... being the Competent Person responsible for
clearing this Permit for Work  Time ........ Date ........

6. CANCELLATION: I certify that all items issued under Section 3 have been accounted for and the Control Person(s)* ........................................... informed of the cancellation and of any restrictions on returning the Plant/Apparatus to service.

Signed ........................................... being the Senior Authorised Person responsible for
cancelling this Permit for Work. Time ........ Date ........

*N/A if Not Applicable

< End of OC8B >

< End of OC8 >
**OPERATING CODE NO.9**

**CONTINGENCY PLANNING**

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OPERATING CODE NO.9

CONTINGENCY PLANNING

OC9.1 INTRODUCTION

Operating Code No.9 ("OC9") covers the following:

OC9.1.1 Black Starts

The implementation of recovery procedures following a Total Shutdown or Partial Shutdown.

OC9.1.2 Re-Synchronisation of Islands

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

The establishment of a communication route and arrangements between senior management representatives of NGET 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 OC9.1.4.

OC9.1.4 It should be noted that under section 96 of the Act the Secretary of State may give directions to NGET 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.

OC9.1.5 NGET shall procure that Relevant Scottish Transmission Licensees shall comply with OC9.4 and OC9.5 and any relevant Local Joint Restoration Plan or OC9 De-Synchronised Island Procedure where and to the extent that such matters apply to them.

OC9.2 OBJECTIVE

The overall objectives of OC9 are:

OC9.2.1 To achieve, as far as possible, restoration of the Total System and associated Demand in the shortest possible time, taking into account Power Station capabilities, including Embedded Generating Units, External Interconnections and the operational constraints of the Total System.
OC9.2.2 To achieve the **Re-Synchronisation** of parts of the **Total System** which have become **Out of Synchronism** with each other.

OC9.2.3 To ensure that communication routes and arrangements are available to enable senior management representatives of **NGET** and **Users**, who are authorised to make binding decisions on behalf of **NGET** or the relevant **User**, as the case may be, to communicate with each other in the situation described in OC9.1.3.

OC9.2.4 To describe the role that in respect of **Scottish Transmission Systems**, **Relevant Scottish Transmission Licensees** may have in the restoration processes as detailed in the relevant **OC9 De-Synchronised Island Procedures** and **Local Joint Restoration Plans**.

OC9.2.5 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:

1. Selectively implement **Local Joint Restoration Plans**
2. Expand **Power Islands** to supply **Power Stations**
3. Expand and merge **Power Islands** leading to **Total System** energisation
4. Selectively reconnect **Demand**
5. Facilitate and coordinate returning the **Total System** back to normal operation leading to the resumption of the **Balancing Mechanism**.

OC9.3 **SCOPE**

OC9.3.1 **OC9** applies to **NGET** and to **Users**, which in **OC9** means:

(a) **Generators**;

(b) **Network Operators**; and

(c) **Non-Embedded Customers**.

OC9.3.2 The procedure for the establishment of emergency support/contingency planning between **NGET** and **Externally Interconnected System Operators** is set out in the **Interconnection Agreement** with each **Externally Interconnected System Operator**.

OC9.3.3 In respect of **Scottish Transmission Systems**, **OC9.4** and **OC9.5** also apply to **Relevant Scottish Transmission Licensees**.

OC9.4 **BLACK START**

**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 **NGET's** directions relating to a **Black Start**.

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 NGET's directions relating to a Black Start.

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 NGET to issue Emergency Instructions in accordance with BC2.9.

OC9.4.5 Black Start Stations

OC9.4.5.1 Certain Power Stations ("Black Start Stations") are registered, pursuant to the Bilateral Agreement with a User, as having an ability for at least one of its Gensets to Start-Up from Shutdown and to energise a part of the Total System, or be Synchronised to the System, upon instruction from NGET within two hours, without an external electrical power supply ("Black Start Capability").

OC9.4.5.2 For each Black Start Station, a Local Joint Restoration Plan will be produced jointly by NGET, the relevant Generator and Network Operator in accordance with the provisions of OC9.4.7.12. The Local Joint Restoration Plan will detail the agreed method and procedure by which a Genset at a Black Start Station (possibly with other Gensets at that Black Start Station) will energise part of the Total System and meet complementary local Demand so as to form a Power Island.

OC9.4.5.3 In respect of Scottish Transmission Systems, a Local Joint Restoration Plan may cover more than one Black Start Station and may be produced with and include obligations on Relevant Scottish Transmission Licensees, Generators responsible for Gensets not at a Black Start Station and other Users.

OC9.4.6 Black Start Situation

In the event of a Total Shutdown or Partial Shutdown, NGET will, as soon as reasonably practical, inform Users (or, in the case of a Partial Shutdown, Users which in NGET'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 NGET intends to implement a Black Start. Following such notification, in accordance with the provisions of the BSC, the BSSCo may determine the time with effect from which the Balancing Mechanism is suspended.

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 and Scottish Offshore Transmission Systems connected to it and operate within its provisions.

OC9.4.7 Black Start

OC9.4.7.1 The procedure necessary for a recovery from a Total Shutdown or Partial Shutdown is known as a "Black Start". 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 Genset 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 establishment of Genset(s) at an isolated Power 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 De-Synchronised Island) and eventually re-establishment of the complete Total System.

NGET Instructions

OC9.4.7.3 The procedures for a Black Start will, therefore, be those specified by NGET at the time. These will normally recognise any applicable Local Joint Restoration Plan. Users shall abide by NGET's instructions during a Black Start situation, even if these conflict with the general overall strategy outlined in OC9.4.7.2 or any applicable Local Joint Restoration Plan. NGET's instructions may (although this list should not be regarded as exhaustive) be to a Black Start Station relating to the commencement of generation, to a Network Operator or Non-Embedded Customer relating to the restoration of Demand, and to a Power Station relating to preparation for commencement of generation when an external power supply is made available to it, and in each case may include the requirement to undertake switching.

In respect of Scottish Transmission Systems SPT and SHETL will act on NGET's behalf in accordance with its duties under the relevant Local Joint Restoration Plan. Scottish Users shall abide by SPT's or SHETL's instructions given in accordance with the Local Joint Restoration Plan during a Black Start situation.

OC9.4.7.4 (a) During a Black Start situation, instructions in relation to Black Start Stations and to Network Operators will be deemed to be Emergency Instructions in BC2.9, and will recognise any differing Black Start 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 BCs). For the purposes of these instructions the Black Start will be an emergency circumstance under BC2.9.

In Scotland, Gensets that are not at Black Start Stations, but which are part of a Local Joint Restoration Plan, may be instructed in accordance with the provisions of that Local Joint Restoration Plan.

During a Black Start situation, instructions in relation to Power Stations and to Network Operators which are not part of a Local Joint Restoration Plan, will be deemed to be Emergency Instructions in accordance with the BC2.9. For the purposes of these instructions the Black Start will be an emergency circumstance under BC2.9.

(b) If during the Demand restoration process any Genset cannot, because of the Demand being experienced, keep within its safe operating parameters, the Generator shall, unless a Local Joint Restoration Plan is in
operation, inform NGET. NGET will, where possible, either instruct Demand to be altered or will re-configure the National Electricity Transmission System or will instruct a User to re-configure its System in order to alleviate the problem being experienced by the Generator. If a Local Joint Restoration Plan is in operation, then the arrangements set out therein shall apply. However, NGET accepts that any decision to keep a Genset operating, if outside its safe operating parameters, is one for the Generator concerned alone and accepts that the Generator may change generation on that Genset 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 Generator shall inform NGET as soon as reasonably practical (unless a Local Joint Restoration Plan is in operation in which case the arrangements set out therein shall apply).

**Embedded Power Stations**

OC9.4.7.5 Without prejudice to the provisions of OC9.4.7.8, Network Operators with Embedded Power Stations will comply with any directions of NGET to restore Demand to be met by the Embedded Power Stations.

**Local Joint Restoration Plan operation**

OC9.4.7.6 (a) The following provisions apply in relation to a Local Joint Restoration Plan. As set out in OC9.4.7.3, NGET may issue instructions which conflict with a Local Joint Restoration Plan. In such cases, these instructions will take precedence over the requirements of the Local Joint Restoration Plan. When issuing such instructions, NGET shall state whether or not it wishes the remainder of the Local Joint Restoration Plan to apply. If, not withstanding that NGET has stated that it wishes the remainder of the Local Joint Restoration Plan to apply, the Generator or the relevant Network Operator consider that NGET's instructions mean that it is not possible to operate the Local Joint Restoration Plan as modified by those instructions, any of them may give notice to NGET and the other parties to the Local Joint Restoration Plan to this effect and NGET shall immediately consult with all parties to the Local Joint Restoration Plan. Unless all parties to the Local Joint Restoration Plan reach an agreement forthwith as to how the Local Joint Restoration Plan shall operate in those circumstances, operation in accordance with the Local Joint Restoration Plan will terminate.

(b) Where NGET, as part of a Black Start, has given an instruction to a Black Start Station to initiate Start-Up, the relevant Genset(s) at the Black Start Station will Start-Up in accordance with the Local Joint Restoration Plan.

(c) NGET 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.

(d) NGET 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.
(e) Following notification from the Generator that the Black Start Station is ready to accept load, NGET will instruct the Black Start Station to energise part of the Total System. The Black Start Station 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 Genset(s) and the connection of Demand so as to establish a Power Island. During this period, the Generator will be required to regulate the output of the relevant Genset(s) at its Black Start Station 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 Genset(s) at the Black Start Station 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.

(f) Operation in accordance with the Local Joint Restoration Plan will be terminated by NGET (by notifying the relevant Users) prior to connecting the Power Island to other Power Islands (other than, in Scotland, as allowed for in the Local Joint Restoration Plan), or to the User System of another Network Operator, or to the synchronising of Gensets at other Power Stations (other than, in Scotland, those forming part of the Local Joint Restoration Plan). Operation in accordance with the Local Joint Restoration Plan will also terminate in the circumstances provided for in OC9.4.7.6(a) if an agreement is not reached or if NGET 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 NGET.

(g) In Scotland, Gensets included in a Local Joint Restoration Plan, but not at a Black Start Station, will operate in accordance with the requirements of the Local Joint Restoration Plan.

**Interconnection of Power Islands**

**OC9.4.7.7** NGET will instruct the relevant Users so as to interconnect Power Islands to achieve larger sub-systems, and subsequently the interconnection of these sub-systems to form an integrated system. 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 and sub-systems will utilise the provisions of all or part of OC9.5 (Re-Synchronisation of De-synchronised Islands) and in such a situation such provisions will be part of the Black Start.

**OC9.4.7.8** As part of the Black Start strategy each Network Operator with either an Embedded Black Start Station which has established a Power Island within its User System or with any Embedded Power Stations within its User System which have become islanded, may in liaison with NGET sustain and expand these islands in accordance with the relevant provisions of OC9.5 which shall apply to this OC9.4 as if set out here. They will inform NGET of their actions and will not Re-Synchronise to the National Electricity Transmission System or any User’s System which is already Synchronised to the National Electricity Transmission System without NGET’s agreement.

Return the Total System Back to Normal Operation
OC9.4.7.9 NGET shall, as soon as reasonably practical, inform Users and the BSSCo when the Total System could return to normal operation. Any such determination by NGET does not mean that the provisions of Section G paragraph 3 (Black Start) of the BSC shall cease to apply.

In making the determination that the Total System could return to normal operation, NGET, 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 or Demand not connected to the National Electricity Transmission System.
(e) the functionality of normal communication systems (i.e. EDT, Control Telephony, etc).

For the avoidance of doubt, until the Conclusion of the Black Start the Balancing Mechanism is unlikely to be operational and NGET is likely to continue to issue Emergency Instructions in accordance with BC2.9.

Conclusion of Black Start

OC9.4.7.10 With effect from the time when the BSSCo has confirmed that the provisions of Section G, paragraph 3 are to cease to apply and that the Balancing Mechanism is re-established the Black Start will conclude and the Total System will be deemed to have returned to normal operation. Following such confirmation operation in accordance with the provisions of this OC9 shall cease.

Externally Interconnected System Operators

OC9.4.7.11 During a Black Start, NGET 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 to the Total System, if they have become separated.

OC9.4.7.12 Local Joint Restoration Plan establishment

(a) In England and Wales, in relation to each Black Start Station, NGET, the Network Operator and the relevant Generator will discuss and agree a Local Joint Restoration Plan. Where at the date of the first inclusion of this OC9.4.7.12 into the Grid Code a local plan covering the procedures to be covered in a Local Joint Restoration Plan is in existence and agreed, NGET will discuss this with the Network Operator and the relevant Generator to agree whether it is consistent with the principles set out in this OC9.4. If it is agreed to be so consistent, then it shall become a Local Joint Restoration Plan under this OC9 and the relevant provisions of OC9.4.7.12(b) shall apply. If it is not agreed to be so consistent, then the provisions of OC9.4.7.12(b) shall apply as if there is no Local Joint Restoration Plan in place.

In respect of Scottish Transmission Systems where a requirement for a Local Joint Restoration Plan is identified, NGET, the Relevant Scottish Transmission Licensee(s), the Network Operator and Black Start
Station(s) will discuss and agree a Local Joint Restoration Plan. In addition other Users, including other Generators, may be reasonably required by NGET to discuss and agree a Local Joint Restoration Plan.

(b) In England and Wales, where the need for a Local Joint Restoration Plan arises when there is none in place, the following provisions shall apply:-

(i) NGET, the Network Operator and the relevant Generator will discuss and agree the detail of the Local Joint Restoration Plan as soon as the requirement for a Local Joint Restoration Plan is identified by NGET. NGET will notify all affected Users, and will initiate these discussions.

(ii) Each Local Joint Restoration Plan will be in relation to a specific Black Start Station.

(iii) The Local Joint Restoration Plan will record which Users and which User Sites are covered by the Local Joint Restoration Plan and set out what is required from NGET and each User should a Black Start situation arise.

(iv) Each Local Joint Restoration Plan shall be prepared by NGET to reflect the above discussions and agreement.

(v) Each page of the Local Joint Restoration Plan shall bear a date of issue and the issue number.

(vi) When a Local Joint Restoration Plan has been prepared, it shall be sent by NGET to the Users involved for confirmation of its accuracy.

(vii) The Local Joint Restoration Plan shall then (if its accuracy has been confirmed) be signed on behalf of NGET and on behalf of each relevant User by way of written confirmation of its accuracy.

(viii) Once agreed under this OC9.4.7.12, the procedure will become a Local Joint Restoration Plan under the Grid Code and (subject to any change pursuant to this OC9) will apply between NGET and the relevant Users as if it were part of the Grid Code.

(ix) Once signed, a copy of the Local Joint Restoration Plan will be distributed by NGET to each User which is a party to it accompanied by a note indicating the date of implementation.

(x) NGET and Users must make the Local Joint Restoration Plan readily available to the relevant operational staff.

(xi) If NGET, or any User which is a party to a Local Joint Restoration Plan, becomes aware that a change is needed to that Local Joint Restoration Plan, it shall (in the case of NGET) initiate a discussion between NGET and the relevant Users to seek to agree the relevant change. If a User becomes so aware, it shall contact NGET who will then initiate such discussions. The principles applying to establishing a new Local Joint Restoration Plan under this OC9.4.7.12 shall apply to such discussions and to any consequent changes.
(xii) **NGET**, the **Network Operator** and the relevant **Generator** will conduct regular joint exercises of the **Local Joint Restoration Plan** to which they are parties. The objectives of such exercises include:

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

The principles applying to the establishment of a new **Local Joint Restoration Plan** under this OC9.4.7.12 shall apply to any changes to the **Local Joint Restoration Plan**.

**NGET** will propose to the parties of a **Local Joint Restoration Plan** a date for the exercise to take place, to be agreed with the other parties. All the **Local Joint 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 **Local Joint Restoration Plan** will be agreed by all parties, but will not be less than one every 8 years.

(c) In respect of **Scottish Transmission Systems**, where the need for a **Local Joint Restoration Plan** arises, the following provisions shall apply:-

(i) **NGET**, the **Relevant Scottish Transmission Licensee(s)**, the **Network Operator** and the relevant **Generator** will discuss and agree the detail of the **Local Joint Restoration Plan** as soon as the requirement for a **Local Joint Restoration Plan** is identified by **NGET**. In addition other **Scottish Users**, including other **Generators**, may be reasonably required by **NGET** to discuss and agree details of the **Local Joint Restoration Plan** as soon as the requirement for a **Local Joint Restoration Plan** is identified by **NGET**. **NGET** will notify the **Relevant Scottish Transmission Licensee(s)** and all affected **Scottish Users**, and will initiate these discussions.

(ii) Each **Local Joint Restoration Plan** may be in relation to either a specific **Black Start Station** or a number of **Black Start Stations**, and may include **Gensets** at **Power Stations** other than a **Black Start Station**.

(iii) The **Local Joint Restoration Plan** will record which **Scottish Users** and which **Scottish User Sites** are covered by the **Local Joint Restoration Plan** and set out what is required from **NGET**, the **Relevant Scottish Transmission Licensee(s)** and each **Scottish User** should a **Black Start** situation arise.

(iv) Each **Local Joint Restoration Plan** shall be prepared by **NGET** to reflect the above discussions and agreement.
(v) Each page of the **Local Joint Restoration Plan** shall bear a date of issue and the issue number.

(vi) When a **Local Joint Restoration Plan** has been prepared, it shall be sent by **NGET** to the **Relevant Scottish Transmission Licensee(s)** and **Scottish Users** involved for confirmation of its accuracy.

(vii) The **Local Joint Restoration Plan** shall then (if its accuracy has been confirmed) be signed on behalf of **NGET** and on behalf of each relevant **Scottish User** and **Relevant Scottish Transmission Licensee(s)** by way of written confirmation of its accuracy.

(viii) Once agreed under this OC9.4.7.12, the procedure will become a **Local Joint Restoration Plan** under the **Grid Code** and (subject to any change pursuant to this OC9) will apply between **NGET**, **Relevant Scottish Transmission Licensee(s)** and the relevant **Scottish Users** as if it were part of the **Grid Code**.

(ix) Once signed, a copy of the **Local Joint Restoration Plan** will be distributed by **NGET** to the **Relevant Scottish Transmission Licensee(s)** and each **Scottish User** which is a party to it accompanied by a note indicating the date of implementation.

(x) **NGET**, the **Relevant Scottish Transmission Licensee(s)** and **Scottish Users** must make the **Local Joint Restoration Plan** readily available to the relevant operational staff.

(xi) If **NGET**, the **Relevant Scottish Transmission Licensee(s)** or any **Scottish User** which is a party to a **Local Joint Restoration Plan**, becomes aware that a change is needed to that **Local Joint Restoration Plan**, it shall (in the case of **NGET**) initiate a discussion between **NGET**, the **Relevant Scottish Transmission Licensee(s)** and the relevant **Scottish Users** to seek to agree the relevant change. If a **Scottish User** or a **Relevant Scottish Transmission Licensee** becomes so aware, it shall contact **NGET** who will then initiate such discussions. The principles applying to establishing a new **Local Joint Restoration Plan** under this OC9.4.7.12 shall apply to such discussions and to any consequent changes.

(xii) **NGET**, the **Relevant Scottish Transmission Licensee(s)**, the **Network Operator** and the relevant **Generator** will conduct regular joint exercises of the **Local Joint Restoration Plan** to which they are parties. The objectives of such exercises include:

- To test the effectiveness of the **Local Joint Restoration Plan**;
- To provide for joint training of the parties in respect of the **Local Joint Restoration Plan**;
- To maintain the parties’ awareness and familiarity of the **Local Joint Restoration Plan**;
- To promote understanding of each parties’ roles under a **Local Joint Restoration Plan**;
- To identify any improvement areas which should be incorporated in to the **Local Joint Restoration Plan**.
The principles applying to the establishment of a new Local Joint Restoration Plan under this OC9.4.7.12 shall apply to any changes to the Local Joint Restoration Plan.

NGET will propose to the parties of a Local Joint Restoration Plan a date for the exercise to take place, to be agreed with the other parties. All the Local Joint 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 Local Joint Restoration Plan will be agreed by all parties, but will not be less than one every 8 years.

**OC9.5 RE-SYNCHRONISATION OF DE-SYNCHRONISED 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 De-synchronised Islands 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 "De-Synchronised Island"), but there is no Total Shutdown or Partial Shutdown, NGET will instruct Users to regulate generation or Demand, as the case may be, to enable the De-Synchronised Islands to be Re-Synchronised and NGET 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 in those De-Synchronised Islands. This OC9.5 provides for how such Embedded generation should be dealt with. In Scotland, this OC9.5 also provides for how Transmission connected generation in De-Synchronised Islands should be dealt with.

(c) In accordance with the provisions of the BCs, NGET 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 a Black Start 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 the OC9.5 shall apply following completion and/or termination of the relevant Local Joint Restoration Plan(s) process as referred to in OC9.4.7.6(f).

**OC9.5.2 Options**

Generation in those De-Synchronised Islands may be dealt with in three different ways, more than one of which may be utilised in relation to any particular incident:-

**OC9.5.2.1 Indirect Data**
(a) **NGET**, each **Generator** with **Synchronised** (or connected and available to generate although not **Synchronised**) **Genset(s)** in the **De-Synchronised Island** and the **Network Operator** whose **User System** forms all or part of the **De-Synchronised Island** shall exchange information as set out in this OC9.5.2.1 to enable **NGET** to issue a **Bid-Offer Acceptance** or an **Emergency Instruction** to that **Generator** in relation to its **Genset(s)** in the **De-Synchronised Island** until **Re-Synchronisation** takes place, on the basis that it will (where practicable) seek to maintain the **Target Frequency**.

(b) The information to **NGET** from the **Generator** will cover its relevant operational parameters as outlined in the **BCs** and from **NGET** to the **Generator** will cover data on **Demand** and changes in **Demand** in the **De-Synchronised Island**.

(c) The information from the **Network Operator** to **NGET** will comprise data on **Demand** in the **De-Synchronised Island**, including data on any constraints within the **De-Synchronised Island**.

(d) **NGET** 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 **De-Synchronised Island**.

**OC9.5.2.2 Direct Data**

(a) **NGET** will issue an **Emergency Instruction** and/or a **Bid-Offer Acceptance**, to the **Generator** to "float" local **Demand** and maintain **Frequency** at **Target Frequency**. Under this the **Generator** will be required to regulate the output of its **Genset(s)** at the **Power Station** in question to the **Demand** prevailing in the **De-Synchronised 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**.

(b) The **Network Operator** is required to be in contact with the **Generator** at the **Power Station** to supply data on **Demand** changes within the **De-Synchronised Island**.

(c) If more than one **Genset** is **Synchronised** on the **De-Synchronised Island**, or is connected to the **De-Synchronised Island** and available to generate although not **Synchronised**, the **Network Operator** will need to liaise with **NGET** to agree which **Genset(s)** will be utilised to accommodate changes in **Demand** in the **De-Synchronised Island**. The **Network Operator** will then maintain contact with the relevant **Generator** (or **Generators**) in relation to that **Genset(s)**.

(d) The **Generator** at the **Power Station** 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 **Genset(s)**, in order that the **Network Operator** can alter the level of **Demand** which that **Generator** needs to meet. Any decision to operate outside any relevant parameters is one entirely for the **Generator**.
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 NGET and the Network Operator and any relevant Generator(s), 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 Genset(s) and simplify the restoration of Demand in the De-Synchronised Island.

(b) In agreeing the establishment of such a system of control features NGET will need to consider its impact on the operation of the National Electricity Transmission 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, NGET may choose to utilise the procedures set out in OC9.5.2.1 or OC9.5.2.2, or may instruct the Genset(s) (or some of them) in the De-Synchronised 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 De-Synchronised Island has come into existence and where an OC9 De-Synchronised Island Procedure under OC9.5.4 has been agreed, NGET, the Network Operator and relevant Generator(s) will operate in accordance with that OC9 De-Synchronised Islands Procedure unless NGET 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 NGET will instruct the relevant Users and the Users will comply with NGET's instructions (which in the case of Generators will relate to generation 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, NGET, the Network Operator and the relevant Generator will discuss and may agree a local procedure (an "OC9 De-Synchronised Island Procedure").

OC9.5.4.1 Where there is no relevant local procedure in place at 12th May 1997, or in the case where the need for an OC9 De-Synchronised Island Procedure arises for the first time, the following provisions shall apply:

(a) NGET, the Network Operator(s) and the relevant Generator(s) 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 NGET or a User, and the party which identifies such a need will notify all affected Users (and NGET, if that party is a User), and NGET 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 between NGET and the Network Operator 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 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 three methods set out in OC9.5 (or combination of the three) shall apply, with any conditions as to applicability being set out as well;

(iii) set out what is required from NGET and each User should a De-Synchronised 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);

(vi) in respect of Scottish Transmission Systems, where the OC9 De-Synchronised Island Procedure includes the establishment of a De-synchronised Island, describe the route for establishment of the De-Synchronised Island.

(d) Each OC9 De-Synchronised Island Procedure shall be prepared by NGET 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 NGET to the Users involved for confirmation of its accuracy.

(g) The OC9 De-Synchronised Island Procedure shall then be signed on behalf of NGET and on behalf of each relevant User by way of written confirmation of its accuracy.
(h) Once agreed under this OC9.5.4.1, 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 **NGET, 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 **NGET** to each **User** which is a party accompanied by a note indicating the issue number and the date of implementation.

(j) **NGET** 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**, **NGET** 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 OC9.5.4.1 shall apply to such discussions and to any consequent changes.

(l) If **NGET**, 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 **NGET** initiate a discussion between **NGET** 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 OC9.5.4.1 shall apply to such discussions and to any consequent changes. If a **User** becomes so aware, it shall contact **NGET** who will then initiate such discussions.

(m) If in relation to any discussions, agreement cannot be reached between **NGET** and the relevant **Users**, **NGET** will operate the **System** on the basis that it will discuss which of the three methods set out in OC9.5.2.1 to OC9.5.2.3 would be most appropriate at the time, if practicable. The complexities and uncertainties of recovery from a **De-Synchronised Island** means that **NGET** 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. **NGET** will instruct the relevant **Users** and the **Users** will comply with **NGET's** instructions as provided in OC9.5.3.

**OC9.5.4.2** Where there is a relevant local procedure in place at 12th May 1997, the following provisions shall apply:-

(a) **NGET** and the **Network Operator** and the relevant **Generator(s)** will discuss the existing procedure to see whether it is consistent with the principles set out in this OC9.5.

(b) If it is, then it shall become an **OC9 De-Synchronised Island Procedure** under this OC9, and the relevant provisions of OC9.5.4.1 shall apply.

(c) If it is not, then the parties will discuss what changes are needed to ensure that it is consistent, and once agreed the procedure will become an **OC9 De-Synchronised Island Procedure** under this OC9, and the relevant provisions of OC9.5.4.1 shall apply.
If agreement cannot be reached between NGET and the relevant Users after a reasonable period of time, the existing procedure will cease to apply and NGET will operate the System on the basis that it will discuss which of the three methods set out in OC9.5.2.1 to OC9.5.2.3 would be most appropriate at the time, if practicable. The complexities and uncertainties of recovery from a De-Synchronised Island means that NGET 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. NGET will instruct the relevant Users and the Users will comply with NGET'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, NGET 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 NGET 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 NGET will, where practicable, be seeking to follow when Re-synchronising De-synchronised 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 coordination 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 coordinate the restoration strategies of the Total System (any Re-Synchronisation of De-Synchronised Islands) following any Total Shutdown or Partial Shutdown, requires NGET and relevant Users to undertake certain planning activities as set out below:

a) NGET 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 NGET information to assist NGET 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 NGET 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 NGET, and

(ii) NGET 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 NGET 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, NGET or a User, as the case may be, will, if it considers necessary, telephone the User or NGET, 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, NGET or a User, as the case may be, will determine whether or not the Event is a Joint System Incident, and, if so, NGET and/or the User may set up an Incident Centre in order to avoid overloading the existing NGET or that User's, as the case may be, operational/control arrangements.
Where **NGET** has determined that an **Event** is a **Joint System Incident**, **NGET** 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.

If a **User** establishes an **Incident Centre** it shall, as soon as possible, notify **NGET** 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.

**NGET'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 **NGET** or the **User**, as the case may be, for:-

(a) the communication and dissemination of information between **NGET** and the senior management representatives of **User(s)**; or

(b) between the **User** and the senior management representatives of **NGET**, 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 **NGET** and **Users** will continue to be used.

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

All communications between the senior management representatives of **NGET** 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.

**NGET** will decide when conditions no longer justify the need to use its **Incident Centre** and will inform all relevant **Users** of this decision.

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 **NGET** of this decision.

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OPERATING CODE NO.10

EVENT INFORMATION SUPPLY

OC10.1 INTRODUCTION

OC10.1.1. Operating Code No.10 ("OC10") sets out:

OC10.1.1.1 the requirements for the reporting in writing and, where appropriate, more fully, those Significant Incidents which were initially reported to NGET or a User orally under OC7; and

OC10.1.1.2 the mechanism for the joint investigation of a Significant Incident or a series of Significant Incidents if NGET and the relevant Users agree.

OC10.2 OBJECTIVE

The objective of OC10 is to facilitate the provision of more detailed information, in writing, of Significant Incidents which were initially orally reported under OC7 and to enable joint investigations to take place if NGET and the relevant Users agree.

OC10.3 SCOPE

OC10.3.1 OC10 applies to NGET and to Users, which in OC10 means:-

(a) Generators (other than those which only have Embedded Small Power Stations and/or Embedded Medium Power Stations);

(b) Network Operators;

(c) Non-Embedded Customers; and

(d) DC Converter Station owners.

The procedure for Event information supply between NGET and Externally Interconnected System Operators is set out in the Interconnection Agreement with each Externally Interconnected System Operator.

OC10.4 PROCEDURE

OC10.4.1 REPORTING

OC10.4.1.1 Written Reporting of Events by Users to NGET

In the case of an Event which was initially reported by a User to NGET orally and subsequently determined by NGET to be a Significant Incident, and accordingly notified by NGET to a User pursuant to OC7, the User will give a written report to NGET, in accordance with OC10. NGET will not pass on this report to other affected Users but may use the information contained therein in preparing a report under OC10 to another User (or in a report which NGET is required to submit
under an Interconnection Agreement) in relation to a Significant Incident (or its equivalent under an Interconnection Agreement or STC) on the National Electricity Transmission System which has been caused by (or exacerbated by) the Significant Incident on the User’s System.

OC10.4.1.2 Written Reporting of Events by NGET to Users

In the case of an Event which was initially reported by NGET to a User orally and subsequently determined by the User to be a Significant Incident, and accordingly notified by the User to NGET pursuant to OC7, NGET will give a written report to the User, in accordance with OC10. The User will not pass on the report to other affected Users but:

(a) a Network Operator may use the information contained therein in preparing a written report to a Generator with a Generating Unit or a Power Park Module connected to its System or to a DC Converter Station owner with a DC Converter connected to its System or to another operator of a User System connected to its System in connection with reporting the equivalent of a Significant Incident under the Distribution Code (or other contract pursuant to which that Generating Unit or that Power Park Module or that DC Converter or User System is connected to its System) (if the Significant Incident on the National Electricity Transmission System caused or exacerbated it); and

(b) a Generator may use the information contained therein in preparing a written report to another Generator with a Generating Unit or a Power Park Module connected to its System or to the operator of a User System connected to its System if it is required (by a contract pursuant to which that Generating Unit or a Power Park Module or that is connected to its System) to do so in connection with the equivalent of a Significant Incident on its System (if the Significant Incident on the National Electricity Transmission System caused or exacerbated it).

OC10.4.1.3 Form

A report under OC10.4.1 shall be sent to NGET or to a User, as the case may be, and will contain a confirmation of the oral notification given under OC7 together with more details relating to the Significant Incident although it (and any response to any question asked) need not state the cause of the Event save to the extent permitted under OC7.4.6.7 and OC7.4.6.9, and such further information which has become known relating to the Significant Incident since the oral notification under OC7. The report should, as a minimum, contain those matters specified in the Appendix to OC10. The Appendix is not intended to be exhaustive. NGET or the User, as the case may be, may raise questions to clarify the notification and the giver of the notification will, in so far as it is able, answer any questions raised.

OC10.4.1.4 Timing

A full written report under OC10.4.1 must, if possible, be received by NGET or the User, as the case may be, within 2 hours of NGET or the User, as the case may be, receiving oral notification under OC7. If this is not possible, the User or NGET, as the case may be, shall, within this period, submit a preliminary report
setting out, as a minimum, those matters specified in the Appendix to OC10. As soon as reasonably practical thereafter, the User or NGET, as the case may be, shall submit a full written report containing the information set out in OC10.4.1.3.

OC10.4.2 Joint Investigations

OC10.4.2.1 Where a Significant Incident (or series of Significant Incidents) has been declared and a report (or reports) under OC10 submitted, NGET or a User which has either given or received a written report under OC10 may request that a joint investigation of a Significant Incident should take place.

OC10.4.2.2 Where there has been a series of Significant Incidents (that is to say, where a Significant Incident has caused or exacerbated another Significant Incident) the party requesting a joint investigation or the recipient of such a request, may request that the joint investigation should include an investigation into that other Significant Incident (or Significant Incidents).

OC10.4.2.3 NGET or a User may also request that:-

(i) an Externally Interconnected System Operator and/or

(ii) Interconnector User or

(iii) (in the case of a Network Operator) a Generator with a Generating Unit or a Power Park Module or a DC Converter Station owner with DC Converter connected to its System or another User System connected to its System or

(iv) (in the case of a Generator) another Generator with a Generating Unit or a Power Park Module connected to its System or a User System connected to its System.

be included in the joint investigation.

OC10.4.2.4 A joint investigation will only take place if NGET and the User or Users involved agree to it (including agreement on the involvement of other parties referred to in OC10.4.2.3). The form and rules of, the procedure for, and all matters (including, if thought appropriate, provisions for costs and for a party to withdraw from the joint investigation once it has begun) relating to the joint investigation will be agreed at the time of a joint investigation and in the absence of agreement the joint investigation will not take place.

OC10.4.2.5 Requests relating to a proposed joint investigation will be in writing.

OC10.4.2.6 Any joint investigation under OC10 is separate to any investigation under the Disputes Resolution Procedure.
APPENDIX

MATTERS, IF APPLICABLE TO THE SIGNIFICANT INCIDENT
AND TO THE RELEVANT USER (OR NGET, AS THE CASE MAY BE.)

TO BE INCLUDED IN A WRITTEN REPORT
GIVEN IN ACCORDANCE WITH OC10.4.1 AND OC10.4.2

1. Time and date of Significant Incident.
2. Location.
3. Plant and/or Apparatus directly involved (and not merely affected by the Event).
4. Description of Significant Incident.
5. Demand (in MW) and/or generation (in MW) interrupted and duration of interruption.
6. Generating Unit, Power Park Module or DC Converter - Frequency response (MW correction achieved subsequent to the Significant Incident).
7. Generating Unit, Power Park Module or DC Converter - Mvar performance (change in output subsequent to the Significant Incident).
8. Estimated time and date of return to service.

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OC11.1 INTRODUCTION

OC11.1.1 Operating Code No.11 ("OC11") sets out the requirement that:

(a) Transmission HV Apparatus on Users' Sites; and

(b) User HV Apparatus on Transmission Sites;

shall have numbering and nomenclature in accordance with the system used from time to time by NGET.

OC11.1.2 The numbering and nomenclature (if required under the system of numbering and nomenclature used from time to time by NGET) of each item of HV Apparatus shall be included in the Operation Diagram prepared for each Transmission Site or User Site, as the case may be. Further provisions on Operation Diagrams are contained in the Connection Conditions and in each Bilateral Agreement.

OC11.1.3 In OC11 the term "HV Apparatus" includes any SF₆ Gas Zones associated with any HV Apparatus.

OC11.2 OBJECTIVE

OC11.2.1 The overall objective of OC11 is to ensure, so far as possible, the safe and effective operation of the Total System and to reduce the risk of human error faults by requiring, in certain circumstances, that the numbering and nomenclature of User's HV Apparatus shall be in accordance with the system used from time to time by NGET.

OC11.3 SCOPE

OC11.3.1 OC11 applies to NGET and to Users, which in OC11 means:-

(a) Generators;

(b) Network Operators;

(c) Non-Embedded Customers; and

(d) DC Converter Station owners.
OC11.4  PROCEDURE

OC11.4.1.1 The term "User Site" means 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, where a site is owned by NGET (in England and Wales) or a Relevant Transmission Licensee (in Scotland or Offshore) but occupied by a User (as aforesaid), the site is a User Site.

OC11.4.1.2 The term "Transmission Site" means a site owned (or occupied pursuant to a lease, licence or other agreement) by NGET (in England and Wales) or by a Relevant Transmission Licensee (in Scotland or Offshore) in which there is a Connection Point. For the avoidance of doubt, where a site is owned by a User but occupied by NGET (in England and Wales) or a Relevant Transmission Licensee (in Scotland or Offshore) (as aforesaid), the site is a Transmission Site.

OC11.4.2 Transmission HV Apparatus on Users' Sites

(a) Transmission HV Apparatus on Users' Sites shall have numbering and nomenclature in accordance with the system used from time to time by NGET;

(b) when NGET (for sites in England and Wales) or the Relevant Transmission Licensee (for sites in Scotland or Offshore) is to install its HV Apparatus on a User's Site, NGET shall (unless it gives rise to a Modification under the CUSC, in which case the provisions of the CUSC as to the timing apply) notify the relevant User of the numbering and nomenclature to be adopted for that HV Apparatus at least eight months prior to proposed installation;

(c) the notification will be made in writing to the relevant User and will consist of both a proposed Operation Diagram incorporating the proposed new Transmission HV Apparatus to be installed, its proposed numbering and nomenclature, and the date of its proposed installation;

(d) the relevant User will respond in writing to NGET within one month of the receipt of the notification, confirming receipt and confirming either that any other HV Apparatus of the relevant User on such User Site does not have numbering and/or nomenclature which could be confused with that proposed by NGET, or, to the extent that it does, that the relevant other numbering and/or nomenclature will be changed before installation of the Transmission HV Apparatus;

(e) the relevant User will not install, or permit the installation of, any HV Apparatus on such User Site which has numbering and/or nomenclature which could be confused with Transmission HV Apparatus which is either already on that User Site or which NGET has notified that User will be installed on that User Site.

OC11.4.3 User HV Apparatus on Transmission Sites

(a) User HV Apparatus on Transmission Sites shall have numbering and nomenclature in accordance with the system used from time to time by NGET;
(b) when a User is to install its HV Apparatus on an Transmission Site, or it wishes to replace existing HV Apparatus on an Transmission Site and it wishes to adopt new numbering and nomenclature for such HV Apparatus, the User shall (unless it gives rise to a Modification under the CUSC in which case the provisions of the CUSC as to the timing apply) notify NGET of the details of the HV Apparatus and the proposed numbering and nomenclature to be adopted for that HV Apparatus, at least eight months prior to proposed installation;

(c) the notification will be made in writing to NGET and shall consist of both a proposed Operation Diagram incorporating the proposed new HV Apparatus of the User to be installed, its proposed numbering and nomenclature, and the date of its proposed installation;

(d) NGET will respond in writing to the User within one month of the receipt of the notification stating whether or not NGET accepts the User's proposed numbering and nomenclature and, if they are not acceptable, it shall give details of the numbering and nomenclature which the User shall adopt for that HV Apparatus.

OC11.4.4 Changes

Where NGET in its reasonable opinion has decided that it needs to change the existing numbering or nomenclature of Transmission HV Apparatus on a User's Site or of User's HV Apparatus on an Transmission Site:

(a) the provisions of paragraph OC11.4.2 shall apply to such change of numbering or nomenclature of Transmission HV Apparatus with any necessary amendments to those provisions to reflect that only a change is being made; and

(b) in the case of a change in the numbering or nomenclature of User's HV Apparatus on a Transmission Site, NGET will (unless it gives rise to a Modification under the CUSC, in which case the provisions of the CUSC as to the timing apply) notify the User of the numbering and/or nomenclature the User shall adopt for the HV Apparatus, the notification to be in a form similar to that envisaged under OC11.4.2) at least eight months prior to the change being needed and the User will respond in writing to NGET within one month of the receipt of the notification, confirming receipt.

In either case the notification shall indicate the reason for the proposed change.

OC11.4.5 Users will be provided upon request with details of NGET's then current numbering and nomenclature system in order to assist them in planning the numbering and nomenclature for their HV Apparatus on Transmission Sites.

OC11.4.6 When a User installs HV Apparatus which is the subject of OC11, the User shall be responsible for the provision and erection of clear and unambiguous labelling showing the numbering and nomenclature. Where a User is required by OC11 to change the numbering and/or nomenclature of HV Apparatus which is the subject of OC11, the User will be responsible for the provision and erection of clear and unambiguous labelling by the required date.
When either NGET (for sites in England and Wales), or a Relevant Transmission Licensee (for sites in Scotland or Offshore) installs HV Apparatus which is the subject of OC11, NGET shall be responsible for the provision and erection of a clear and unambiguous labelling showing the numbering and nomenclature. Where NGET changes the numbering and/or nomenclature of HV Apparatus which is the subject of OC11, NGET will be responsible for the provision and erection of clear and unambiguous labelling showing the numbering and nomenclature by the required date.

OC11.4.7 For sites in England and Wales, NGET will not change its system of numbering and nomenclature in use immediately prior to the Transfer Date (which is embodied in OM5 (Operation Memorandum No.5 - Numbering and Nomenclature of HV Apparatus on the CEBG Grid System Issue 3 June 1987)), other than to reflect new or newly adopted technology or HV Apparatus. For the avoidance of doubt, this OC11.4.7 refers to the system of numbering and nomenclature, and does not preclude changes to the numbering and/or nomenclature of HV Apparatus which are necessary to reflect newly installed HV Apparatus, or re-configuration of HV Apparatus installed, and similar changes being made in accordance with that system of numbering and nomenclature.

< End of OC11 >
# OPERATING CODE NO.12

## SYSTEM TESTS

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OPERATING CODE NO.12

SYSTEM TESTS

OC12.1 INTRODUCTION

OC12.1.1 Operating Code No.12 ("OC12") relates to System Tests, which are 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.

OC12.1.2 OC12 deals with the responsibilities and procedures for arranging and carrying out System Tests which have (or may have) an effect on the Systems of NGET and Users and/or on the System of any Externally Interconnected System Operator. Where a System Test proposed by a User will have no effect on the National Electricity Transmission System, then such a System Test does not fall within OC12 and accordingly OC12 shall not apply to it. A System Test proposed by NGET which will have an effect on the System of a User will always fall within OC12.

OC12.2 OBJECTIVE

The overall objectives of OC12 are:

OC12.2.1 to ensure, so far as possible, that System Tests proposed to be carried out either by:

(a) a User (or certain persons in respect of Systems Embedded within a Network Operator's System) which may have an effect on the Total System or any part of the Total System (in addition to that User's System) including the National Electricity Transmission System; or

(b) by NGET which may have an effect on the Total System or any part of the Total System (in addition to the National Electricity Transmission System)

do not threaten the safety of either their personnel or the general public, cause minimum threat to the security of supplies and to the integrity of Plant and/or Apparatus, and cause minimum detriment to NGET and Users;

OC12.2.2 to set out the procedures to be followed for establishing and reporting System Tests.

OC12.3 SCOPE

OC12 applies to NGET and to Users, which in OC12 means:-

(a) Generators other than in respect of Embedded Medium Power Stations and Embedded Small Power Stations (and the term Generator in OC12 shall be constructed accordingly);

(b) Network Operators;
The procedure for the establishment of System Tests on the National Electricity Transmission System, with Externally Interconnected System Operators which do not affect any User, is set out in the Interconnection Agreement with each Externally Interconnected System Operator. The position of Externally Interconnected System Operators and Interconnector Users is also referred to in OC12.4.2.

Each Network Operator will liaise within NGET as necessary in those instances where an Embedded Person intends to perform a System Test which may have an effect on the Total System or any part of the Total System (in addition to that Generator's or other User's System) including the National Electricity Transmission System. NGET is not required to deal with such persons.

Each Network Operator shall be responsible for coordinating with the Embedded Person or such other person and assessing the effect of any System Tests upon:

(a) any Embedded Medium Power Station, Embedded Small Power Stations or Embedded DC Converter Station within the Network Operator's System; or

(b) any other User connected to or within the Network Operator's System.

NGET is not required to deal with such persons.

PROCEDURE

Where a User (or in the case of a Network Operator, a person in respect of Systems Embedded within its System, as the case may be) has decided that it would like to undertake a System Test it shall submit a notice (a "Proposal Notice") to NGET at least twelve months in advance of the date it would like to undertake the proposed System Test.

The Proposal Notice shall be in writing and shall contain details of the nature and purpose of the proposed System Test and shall indicate the extent and situation of the Plant and/or Apparatus involved.

If NGET is of the view that the information set out in the Proposal Notice is insufficient, it will contact the person who submitted the Proposal Notice (the "Test Proposer") as soon as reasonably practicable, with a written request for further information. NGET will not be required to do anything under OC12 until it is satisfied with the details supplied in the Proposal Notice or pursuant to a request for further information.
OC12.4.1.4 If NGET wishes to undertake a **System Test**, NGET shall be deemed to have received a **Proposal Notice** on that **System Test**.

OC12.4.1.5 Where, under **OC12**, NGET is obliged to notify or contact the **Test Proposer**, NGET will not be so obliged where it is NGET that has proposed the **System Test**. **Users** and the **Test Panel**, where they are obliged under **OC12** to notify, send reports to or otherwise contact both NGET and the **Test Proposer**, need only do so once where NGET is the proposer of the **System Test**.

OC12.4.2 **Preliminary Notice** and establishment of **Test Panel**

OC12.4.2.1 Using the information supplied to it under **OC12.4.1** NGET will determine, in its reasonable estimation, which **Users**, other than the **Test Proposer**, may be affected by the proposed **System Test**. If NGET determines, in its reasonable estimation, that an **Externally Interconnected System Operator** and/or **Interconnector User** (or **Externally Interconnected System Operators** and/or **Interconnector Users**) may be affected by the proposed **System Test**, then (provided that the **Externally Interconnected System Operator** and/or **Interconnector User** (or each **Externally Interconnected System Operator** and/or **Interconnector User** where there is more than one affected) undertakes to all the parties to the **Grid Code** to be bound by the provisions of the **Grid Code** for the purposes of the **System Test**) for the purposes of the remaining provisions of this **OC12**, that an **Externally Interconnected System Operator** and/or **Interconnector User** (or each of those **Externally Interconnected System Operators** and/or **Interconnector Users**) will be deemed to be a **User** and references to the **Total System** or to the **Plant** and/or **Apparatus** of a **User** will be deemed to include a reference to the transmission or distribution system and plant and/or apparatus of that **Externally Interconnected System Operator** and/or **Interconnector User** or (as the case may be) those **Externally Interconnected System Operators** and/or **Interconnector Users**. In the event that the **Externally Interconnected System Operator** and/or **Interconnector User** (or any of the **Externally Interconnected System Operators** and/or **Interconnector Users** where there is more than one affected) refuses to so undertake, then the **System Test** will not take place.

OC12.4.2.2 NGET will appoint a person to co-ordinate the **System Test** (a "**Test Co-ordinator**") as soon as reasonably practicable after it has, or is deemed to have, received a **Proposal Notice** and in any event prior to the distribution of the **Preliminary Notice** referred to below. The **Test Co-ordinator** shall act as Chairman of the **Test Panel** and shall be an ex-officio member of the **Test Panel**.

(a) Where NGET decides, in its reasonable opinion, that the **National Electricity Transmission System** will or may be significantly affected by the proposed **System Test**, then the **Test Co-ordinator** will be a suitably qualified person nominated by NGET after consultation with the **Test Proposer** and the **Users** identified under **OC12.4.2.1**.

(b) Where NGET decides, in its reasonable opinion, that the
National Electricity Transmission System will not be significantly affected by the proposed System Test, then the Test Co-ordinator will be a suitably qualified person nominated by the Test Proposer after consultation with NGET.

(c) NGET will, as soon as reasonably practicable after it has received, or is deemed to have received, a Proposal Notice, contact the Test Proposer where the Test Co-ordinator is to be a person nominated by the Test Proposer and invite it to nominate a person as Test Co-ordinator. If the Test Proposer is unable or unwilling to nominate a person within seven days of being contacted by NGET then the proposed System Test will not take place.

OC12.4.2.3 NGET will notify all Users identified by it under OC12.4.2.1 of the proposed System Test by a notice in writing (a "Preliminary Notice") and will send a Preliminary Notice to the Test Proposer. The Preliminary Notice will contain:

(a) the details of the nature and purpose of the proposed System Test, the extent and situation of the Plant and/or Apparatus involved and the identity of the Users identified by NGET under OC12.4.2.1 and the identity of the Test Proposer;

(b) an invitation to nominate within one month a suitably qualified representative (or representatives, if the Test Co-ordinator informs NGET that it is appropriate for a particular User including the Test Proposer) to be a member of the Test Panel for the proposed System Test;

(c) the name of the NGET representative (or representatives) on the Test Panel for the proposed System Test; and

(d) the name of the Test Co-ordinator and whether he was nominated by the Test Proposer or by NGET.

OC12.4.2.4 The Preliminary Notice will be sent within one month of the later of either the receipt by NGET of the Proposal Notice, or of the receipt of any further information requested by NGET under OC12.4.1.3. Where NGET is the proposer of the System Test, the Preliminary Notice will be sent within one month of the proposed System Test being formulated.

OC12.4.2.5 Replies to the invitation in the Preliminary Notice to nominate a representative to be a member of the Test Panel must be received by NGET within one month of the date on which the Preliminary Notice was sent to the User by NGET. Any User which has not replied within that period will not be entitled to be represented on the Test Panel. If the Test Proposer does not reply within that period, the proposed System Test will not take place and NGET will notify all Users identified by it under OC12.4.2.1 accordingly.

OC12.4.2.6 NGET will, as soon as possible after the expiry of that one month period, appoint the nominated persons to the Test Panel and notify all Users identified by it under OC12.4.2.1 and the Test Proposer, of the
composition of the Test Panel.

OC12.4.3 Test Panel

OC12.4.3.1 A meeting of the Test Panel will take place as soon as possible after NGET has notified all Users identified by it under OC12.4.2.1 and the Test Proposer of the composition of the Test Panel, and in any event within one month of the appointment of the Test Panel.

OC12.4.3.2 The Test Panel shall consider:

(a) the details of the nature and purpose of the proposed System Test and other matters set out in the Proposal Notice (together with any further information requested by NGET under OC12.4.1.3);

(b) the economic, operational and risk implications of the proposed System Test;

(c) the possibility of combining the proposed System Test with any other tests and with Plant and/or Apparatus outages which arise pursuant to the Operational Planning requirements of NGET and Users; and

(d) implications of the proposed System Test on the operation of the Balancing Mechanism, in so far as it is able to do so.

OC12.4.3.3 Users identified by NGET under OC12.4.2.1, the Test Proposer and NGET (whether or not they are represented on the Test Panel) shall be obliged to supply that Test Panel, upon written request, with such details as the Test Panel reasonably requires in order to consider the proposed System Test.

OC12.4.3.4 The Test Panel shall be convened by the Test Co-ordinator as often as he deems necessary to conduct its business.

OC12.4.4 Proposal Report

OC12.4.4.1 Within two months of first meeting the Test Panel will submit a report (a "Proposal Report"), which will contain:

(a) proposals for carrying out the System Test (including the manner in which the System Test is to be monitored);

(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

(c) such other matters as the Test Panel considers appropriate.

The Proposal Report may include requirements for indemnities (including an indemnity from the relevant Network Operator to NGET and other Users in relation to its Embedded Persons) to be given in respect of claims and losses arising from the System Test. All System Test procedures must comply with all applicable legislation.
OC12.4.4.2 If the Test Panel is unable to agree unanimously on any decision in preparing its Proposal Report, the proposed System Test will not take place and the Test Panel will be dissolved.

OC12.4.4.3 The Proposal Report will be submitted to NGET, the Test Proposer and to each User identified by NGET under OC12.4.2.1.

OC12.4.4.4 Each recipient will respond to the Test Co-ordinator with its approval of the Proposal Report or its reason for non-approval within fourteen days of receipt of the Proposal Report. If any recipient does not respond, the System Test will not take place and the Test Panel will be dissolved.

OC12.4.4.5 In the event of non-approval by one or more recipients, the Test Panel will meet as soon as practicable in order to determine whether the proposed System Test can be modified to meet the objection or objections.

OC12.4.4.6 If the proposed System Test cannot be so modified, the System Test will not take place and the Test Panel will be dissolved.

OC12.4.4.7 If the proposed System Test can be so modified, the Test Panel will, as soon as practicable, and in any event within one month of meeting to discuss the responses to the Proposal Report, submit a revised Proposal Report and the provisions of OC12.4.4.3 and OC12.4.4.4 will apply to that submission.

OC12.4.4.8 In the event of non-approval of the revised Proposal Report by one or more recipients, the System Test will not take place and the Test Panel will be dissolved.

OC12.4.5 Test Programme

OC12.4.5.1 If the Proposal Report (or, as the case may be, the revised Proposal Report) is approved by all recipients, the proposed System Test can proceed and at least one month prior to the date of the proposed System Test, the Test Panel will submit to NGET, the Test Proposer and each User identified by NGET under OC12.4.2.1, a programme (the "Test Programme") stating 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 site safety) and such other matters as the Test Panel deems appropriate.

OC12.4.5.2 The Test Programme will, subject to OC12.4.5.3, bind all recipients to act in accordance with the provisions of the Test Programme in relation to the proposed System Test.

OC12.4.5.3 Any problems with the proposed System Test which arise or are anticipated after the issue of the Test Programme and prior to the day of the proposed System Test, must be notified to the Test Co-ordinator as soon as possible in writing. If the Test Co-ordinator decides that these anticipated problems merit an amendment to, or postponement of, the System Test, he shall notify the Test Proposer (if the Test Co-ordinator was not appointed by the Test Proposer), NGET and each User identified by NGET under OC12.4.2.1 accordingly.
OC12.4.5.4 If on the day of the proposed System Test, operating conditions on the Total System are such that any party involved in the proposed System Test wishes to delay or cancel the start or continuance of the System Test, they shall immediately inform the Test Co-ordinator of this decision and the reasons for it. The Test Co-ordinator shall then postpone or cancel, as the case may be, the System Test and shall, if possible, agree with the Test Proposer (if the Test Co-ordinator was not appointed by the Test Proposer), NGET and all Users identified by NGET under OC12.4.2.1 another suitable time and date. If he cannot reach such agreement, the Test Co-ordinator shall reconvene the Test Panel as soon as practicable, which will endeavour to arrange another suitable time and date for the System Test, in which case the relevant provisions of OC12 shall apply.

OC12.4.6 Final Report

OC12.4.6.1 At the conclusion of the System Test, the Test Proposer shall be responsible for preparing a written report on the System Test (the "Final Report") for submission to NGET and other members of the Test Panel. The Final Report shall be submitted within three months of the conclusion of the System Test unless a different period has been agreed by the Test Panel prior to the System Test taking place.

OC12.4.6.2 The Final Report shall not be submitted to any person who is not a member of the Test Panel unless the Test Panel, having considered the confidentiality issues arising, shall have unanimously approved such submission.

OC12.4.6.3 The Final Report shall include a description of the Plant and/or Apparatus tested and a description of the System Test carried out, together with the results, conclusions and recommendations.

OC12.4.6.4 When the Final Report has been prepared and submitted in accordance with OC12.4.6.1, the Test Panel will be dissolved.

OC12.4.7 Timetable Reduction

OC12.4.7.1 In certain cases a System Test may be needed on giving less than twelve months notice. In that case, after consultation with the Test Proposer and User(s) identified by NGET under OC12.4.2.1, NGET shall draw up a timetable for the proposed System Test and the procedure set out in OC12.4.2 to OC12.4.6 shall be followed in accordance with that timetable.

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BALANCING CODE No 1

PRE GATE CLOSURE PROCESS

BC1.1 INTRODUCTION

Balancing Code No1 (BC1) sets out the procedure for:

(a) the submission of BM Unit Data and/or Generating Unit Data by each BM Participant;

(b) the submission of certain System data by each Network Operator; and

(c) the provision of data by NGET,

in the period leading up to Gate Closure.

BC1.2 OBJECTIVE

The procedure for the submission of BM Unit Data and/or Generating Unit Data is intended to enable NGET to assess which BM Units and Generating Units are expected to be operating in order that NGET can ensure (so far as possible) the integrity of the National Electricity Transmission System, and the security and quality of supply.

Where reference is made in this BC1 to Generating Units (unless otherwise stated) it only applies:

(a) to each Generating Unit which forms part of the BM Unit of a Cascade Hydro Scheme; and

(b) at an Embedded Exemptable Large Power Station where the relevant Bilateral Agreement specifies that compliance with BC1 is required:

i) to each Generating Unit, or

ii) to each Power Park Module where the Power Station comprises Power Park Modules.

BC1.3 SCOPE

BC1 applies to NGET and to Users, which in this BC1 means:-

(a) BM Participants;

(b) Externally Interconnected System Operators; and

(c) Network Operators.
BC1.4 SUBMISSION OF DATA

In the case of BM Units or Generating Units Embedded in a User System, any data submitted by Users under this BC1 must represent the value of the data at the relevant Grid Supply Point.

BC1.4.1 Communication with Users

(a) Submission of BM Unit Data and Generating Unit Data by Users to NGET specified in BC1.4.2 to BC1.4.4 (with the exception of BC1.4.2(f)) is to be by use of electronic data communications facilities, as provided for in CC.6.5.8. However, data specified in BC1.4.2(c) and BC1.4.2(e) only, may be revised by telephone following its initial submission by electronic data communication facilities.

(b) In the event of a failure of the electronic data communication facilities, the data to apply in relation to a pre-Gate Closure period will be determined in accordance with the Data Validation, Consistency and Defaulting Rules, based on the most recent data received and acknowledged by NGET.

(c) Planned Maintenance Outages will normally be arranged to take place during periods of low data transfer activity.

(d) Upon any Planned Maintenance Outage, or following an unplanned outage described in BC1.4.1(b) (where it is termed a "failure") in relation to a pre-Gate Closure period:-

(i) BM Participants should continue to act in relation to any period of time in accordance with the Physical Notifications current at the time of the start of the Planned Maintenance Outage or the computer system failure in relation to each such period of time subject to the provisions of BC2.5.1. Depending on when in relation to Gate Closure the planned or unplanned maintenance outage arises such operation will either be operation in preparation for the relevant output in real time, or will be operation in real time. No further submissions of BM Unit Data and/or Generating Unit Data (other than data specified in BC1.4.2(c) and BC1.4.2(e)) should be attempted. Plant failure or similar problems causing significant deviation from Physical Notification should be notified to NGET by the submission of a revision to Export and Import Limits in relation to the BM Unit and /or Generating Unit so affected;

(ii) during the outage, revisions to the data specified in BC1.4.2(c) and BC1.4.2(e) may be submitted. Communication between Users’ Control Points and NGET during the outage will be conducted by telephone; and

(iii) no data will be transferred from NGET to the BMRA until the communication facilities are re-established.

BC1.4.2 Day Ahead Submissions

Data for any Operational Day may be submitted to NGET up to several days in advance of the day to which it applies, as provided in the Data Validation, Consistency and Defaulting Rules. However, Interconnector Users must submit Physical Notifications, and any associated data as necessary, each day by 11:00 hours in respect of the next following Operational Day in order that the information used in relation to the capability of the respective External Interconnection is
expressly provided. NGET shall not by the inclusion of this provision be prevented from utilising the provisions of BC1.4.5 if necessary.

The data may be modified by further data submissions at any time prior to Gate Closure, in accordance with the other provisions of BC1. The data to be used by NGET for operational planning will be determined from the most recent data that has been received by NGET by 11:00 hours on the day before the Operational Day to which the data applies, or from the data that has been defaulted at 11:00 hours on that day in accordance with BC1.4.5. Any subsequent revisions received by NGET under the Grid Code will also be utilised by NGET. In the case of all data items listed below, with the exception of item (e), Dynamic Parameters (Day Ahead), the latest submitted or defaulted data, as modified by any subsequent revisions, will be carried forward into operational timescales. The individual data items are listed below:-

(a) Physical Notifications

Physical Notifications, being the data listed in BC1 Appendix 1 under that heading, are required by NGET at 11:00 hours each day for each Settlement Period of the next following Operational Day, in respect of:

(1) BM Units:-

(i) with a Demand Capacity with a magnitude of 50MW or more in NGET's Transmission Area or 10MW or more in SHETL's Transmission Area or 30MW or more in SPT's Transmission Area; or

(ii) comprising Generating Units (as defined in the Glossary and Definitions and not limited by BC1.2) and/or CCGT Modules and/or Power Park Modules in each case at Large Power Stations, Medium Power Stations and Small Power Stations where such Small Power Stations are directly connected to an Offshore Transmission System; or

(iii) where the BM Participant chooses to submit Bid-Offer Data in accordance with BC1.4.2(d) for BM Units not falling within (i) or (ii) above,

and

(2) each Generating Unit where applicable under BC1.2.

Physical Notifications may be submitted to NGET by BM Participants, for the BM Units, and Generating Units, specified in this BC1.4.2(a) at an earlier time, or BM Participants may rely upon the provisions of BC1.4.5 to create the Physical Notifications by data defaulting pursuant to the Grid Code utilising the rules referred to in that paragraph at 11:00 hours in any day.

Physical Notifications (which must comply with the limits on maximum rates of change listed in BC1 Appendix 1) must, subject to the following operating limits, represent the User's best estimate of expected input or output of Active Power and shall be prepared in accordance with Good Industry Practice. Physical Notifications for any BM Unit, and any Generating Units, should normally be consistent with the Dynamic Parameters and Export and Import Limits and must not reflect any BM Unit or any Generating Units, proposing to operate outside the limits of its Demand Capacity and (and in the case of BM Units) Generation Capacity and, in the case of a BM Unit comprising a Generating Unit (as defined in the Glossary and Definitions and not limited by BC1.2) or CCGT Module or Power Park Module, its Registered Capacity.
These **Physical Notifications** provide, amongst other things, indicative **Synchronising** and **De-Synchronising** times to **NGET** in respect of any **BM Unit** comprising a **Generating Unit** (as defined in the Glossary and Definitions and not limited by BC1.2) or **CCGT Module** or **Power Park Module**, and for any **Generating Units**, and provide an indication of significant **Demand** changes in respect of other **BM Units**.

(b) **Quiescent Physical Notifications**

Each **BM Participant** may, in respect of each of its **BM Units**, submit to **NGET** for each **Settlement Period** of the next following **Operational Day** the data listed in **BC1 Appendix 1** under the heading of “**Quiescent Physical Notifications**” to amend the data already held by **NGET** in relation to **Quiescent Physical Notifications**, which would otherwise apply for those **Settlement Periods**.

(c) **Export and Import Limits**

Each **BM Participant** may, in respect of each of its **BM Units** and its **Generating Units** submit to **NGET** for any part or for the whole of the next following **Operational Day** the data listed in **BC1 Appendix 1** under the heading of “**Export and Import Limits**” to amend the data already held by **NGET** in relation to **Export and Import Limits**, which would otherwise apply for those **Settlement Periods**.

**Export and Import Limits** respectively represent the maximum export to or import from the **National Electricity Transmission System** for a **BM Unit** and a **Generating Unit** and are the maximum levels that the **BM Participant** wishes to make available and must be prepared in accordance with **Good Industry Practice**.

(d) **Bid-Offer Data**

Each **BM Participant** may, in respect of each of its **BM Units**, but must not in respect of its **Generating Units** submit to **NGET** for any **Settlement Period** of the next following **Operational Day** the data listed in **BC1 Appendix 1** under the heading of “**Bid-Offer Data**” to amend the data already held by **NGET** in relation to **Bid-Offer Data**, which would otherwise apply to those **Settlement Periods**. The submitted **Bid-Offer Data** will be utilised by **NGET** in the preparation and analysis of its operational plans for the next following **Operational Day**. **Bid-Offer Data** may not be submitted unless an automatic logging device has been installed at the **Control Point** for the **BM Unit** in accordance with **CC.6.5.8(b)**.

(e) **Dynamic Parameters** (Day Ahead)

Each **BM Participant** may, in respect of each of its **BM Units**, but must not in respect of its **Generating Units** submit to **NGET** for the next following **Operational Day** the data listed in **BC1 Appendix 1** under the heading of “**Dynamic Parameters**” to amend that data already held by **NGET**.

These **Dynamic Parameters** shall reasonably reflect the expected true operating characteristics of the **BM Unit** and shall be prepared in accordance with **Good Industry Practice**. In any case where non-zero **QPN** data has been provided in accordance with **BC1.4.2(b)**, the **Dynamic Parameters** will apply to the element being offered for control only, i.e. to the component of the **Physical Notification** between the **QPN** and the full level of the **Physical Notification**.

The **Dynamic Parameters** applicable to the next following **Operational Day** will be utilised by **NGET** in the preparation and analysis of its operational plans for the next following **Operational Day** and may be used to instruct certain **Ancillary Services**. For the avoidance of doubt, the **Dynamic Parameters** to be used in the current **Operational Day** will be those submitted in accordance with **BC2.5.3.1**.
Other Relevant Data

By 11:00 hours each day each BM Participant, in respect of each of its BM Units and Generating Units for which Physical Notifications are being submitted, shall, if it has not already done so, submit to NGET (save in respect of item (vi) where the item shall be submitted only when reasonably required by NGET), in respect of the next following Operational Day the following:

(i) in the case of a CCGT Module, a CCGT Module Matrix as described in BC1 Appendix 1;

(ii) details of any special factors which in the reasonable opinion of the BM Participant may have a material effect or present an enhanced risk of a material effect on the likely output (or consumption) of such BM Unit(s). Such factors may include risks, or potential interruptions, to BM Unit fuel supplies, or developing plant problems, details of tripping tests, etc. This information will normally only be used to assist in determining the appropriate level of Operating Margin that is required under OC2.4.6;

(iii) in the case of Generators, any temporary changes, and their possible duration, to the Registered Data of such BM Unit;

(iv) in the case of Suppliers, details of Customer Demand Management taken into account in the preparation of its BM Unit Data;

(v) details of any other factors which NGET may take account of when issuing Bid-Offer Acceptances for a BM Unit (e.g., Synchronising or De-Synchronising Intervals, the minimum notice required to cancel a Synchronisation, etc); and

(vi) in the case of a Cascade Hydro Scheme, the Cascade Hydro Scheme Matrix as described in BC1 Appendix 1.

(vii) in the case of a Power Park Module, a Power Park Module Availability Matrix as described in BC1 Appendix 1.

Joint BM Unit Data

BM Participants may submit Joint BM Unit Data in accordance with the provisions of the BSC. For the purposes of the Grid Code, such data shall be treated as data submitted under BC1.

BC1.4.3 Data Revisions

The BM Unit Data, and Generating Unit Data, derived at 1100 hours each day under BC1.4.2 above may need to be revised by the BM Participant for a number of reasons, including for example, changes to expected output or input arising from revised contractual positions, plant breakdowns, changes to expected Synchronising or De-Synchronising times, etc, occurring before Gate Closure. BM Participants should use reasonable endeavours to ensure that the data held by NGET in relation to its BM Units and Generating Units, is accurate at all times. Revisions to BM Unit Data, and Generating Unit Data for any period of time up to Gate Closure should be submitted to NGET as soon as reasonably practicable after a change becomes apparent to the BM Participant. NGET will use reasonable endeavours to utilise the most recent data received from Users, subject to the application of the provisions of BC1.4.5, for its preparation and analysis of operational plans.
BC1.4.4 Receipt of BM Unit Data prior to Gate Closure

BM Participants submitting Bid-Offer Data, in respect of any BM Unit for use in the Balancing Mechanism for any particular Settlement Period in accordance with the BSC, must ensure that Physical Notifications and Bid-Offer Data for such BM Units are received in their entirety and logged into NGET’s computer systems by the time of Gate Closure for that Settlement Period. In all cases the data received will be subject to the application under the Grid Code of the provisions of BC1.4.5.

For the avoidance of doubt, no changes to the Physical Notification, QPN data or Bid-Offer Data for any Settlement Period may be submitted to NGET after Gate Closure for that Settlement Period.

BC1.4.5 BM Unit Data Defaulting, Validity and Consistency Checking

In the event that no submission of any or all of the BM Unit Data and Generating Unit Data in accordance with BC1.4.2 in respect of an Operational Day, is received by NGET by 11:00 hours on the day before that Operational Day, NGET will apply the Data Validation, Consistency and Defaulting Rules, with the default rules applicable to Physical Notifications, Quiescent Physical Notifications and Export and Import Limits data selected as follows:

(a) for an Interconnector User’s BM Unit, the defaulting rules will set some or all of the data for that Operational Day to zero, unless the relevant Interconnector arrangements, as agreed with NGET, state otherwise (in which case (b) applies); and

(b) for all other BM Units or Generating Units, the defaulting rules will set some or all of the data for that Operational Day to the values prevailing in the current Operational Day.

A subsequent submission by a User of a data item which has been so defaulted under the Grid Code will operate as an amendment to that defaulted data and thereby replace it. Any such subsequent submission is itself subject to the application under the Grid Code of the Data Validation, Consistency and Defaulting Rules.

BM Unit Data and Generating Unit Data submitted in accordance with the provisions of BC1.4.2 to BC1.4.4 will be checked under the Grid Code for validity and consistency in accordance with the Data Validation, Consistency and Defaulting Rules. If any BM Unit Data and Generating Unit Data so submitted fails the data validity and consistency checking, this will result in the rejection of all data submitted for that BM Unit or Generating Unit included in the electronic data file containing that data item and that BM Unit’s or Generating Unit’s data items will be defaulted under the Grid Code in accordance with the Data Validation, Consistency and Defaulting Rules. Data for other BM Units and Generating Units included in the same electronic data file will not be affected by such rejection and will continue to be validated and checked for consistency prior to acceptance. In the event that rejection of any BM Unit Data and Generating Unit Data occurs, details will be made available to the relevant BM Participant via the electronic data communication facilities. In the event of a difference between the BM Unit Data for the Cascade Hydro Scheme and sum of the data submitted for the Generating Units forming part of such Cascade Hydro Scheme, the BM Unit Data shall take precedence.

BC1.4.6 Special Provisions relating to Interconnector Users

(a) The total of the relevant Physical Notifications submitted by Interconnector Users in respect of any period of time should not exceed the capability (in MW) of the respective External Interconnection for that period of time. In
the event that it does, then NGET shall advise the Externally Interconnected System Operator accordingly. In the period between such advice and Gate Closure, one or more of the relevant Interconnector Users would be expected to submit revised Physical Notifications to NGET to eliminate any such over-provision.

(b) In any case where, as a result of a reduction in the capability (in MW) of the External Interconnection in any period during an Operational Day which is agreed between NGET and an Externally Interconnected System Operator after 0900 hours on the day before the beginning of such Operational Day, the total of the Physical Notifications in the relevant period using that External Interconnection, as stated in the BM Unit Data exceeds the reduced capability (in MW) of the respective External Interconnection in that period then NGET shall notify the Externally Interconnected System Operator accordingly.

BC1.5 INFORMATION PROVIDED BY NGET

NGET shall provide data to the Balancing Mechanism Reporting Agent or BSCCo each day in accordance with the requirements of the BSC in order that the data may be made available to Users via the Balancing Mechanism Reporting Service (or by such other means) in each case as provided in the BSC. Where NGET provides such information associated with the secure operation of the System to the Balancing Mechanism Reporting Agent, the provision of that information is additionally provided for in the following sections of this BC1.5. NGET shall be taken to have fulfilled its obligations to provide data under BC1.5.1, BC1.5.2, and BC1.5.3 by so providing such data to the Balancing Mechanism Reporting Agent.

BC1.5.1 Demand Estimates
Normally by 0900 hours each day, NGET will make available to Users a forecast of National Demand and the Demand for a number of pre-determined constraint groups (which may be updated from time to time, as agreed between NGET and BSCCo) for each Settlement Period of the next following Operational Day. Normally by 1200 hours each day, NGET will make available to Users a forecast of National Electricity Transmission System Demand for each Settlement Period of the next Operational Day. Further details are provided in Appendix 2.

BC1.5.2 Indicated Margin and Indicated Imbalance
Normally by 1200 hours each day, NGET will make available to Users an Indicated Margin and an Indicated Imbalance for each Settlement Period of the next following Operational Day. NGET will use reasonable endeavours to utilise the most recent data received from Users in preparing for this release of data. Further details are provided in Appendix 2.

BC1.5.3 Provision of Updated Information
NGET will provide updated information on Demand and other information at various times throughout each day, as detailed in Appendix 2. NGET will use reasonable endeavours to utilise the most recent data received from Users in preparing for this release of data.

BC1.5.4 Reserve and Inadequate System Margin

Contingency Reserve

(a) The amount of Contingency Reserve required at the day ahead stage and in subsequent timescales will be decided by NGET on the basis of historical
trends in the reduction in availability of Large Power Stations and increases in forecast Demand up to real time operation. Where Contingency Reserve is to be allocated to thermal Gensets, NGET will instruct through a combination of Ancillary Services instructions and Bid-Offer Acceptances, the time at which such Gensets are required to synchronise, such instructions to be consistent with Dynamic Parameters and other contractual arrangements.

Operating Reserve

(b) The amount of Operating Reserve required at any time will be determined by NGET having regard to the Demand levels, Large Power Station availability shortfalls and the greater of the largest secured loss of generation (ie, the loss of generation against which, as a requirement of the Licence Standards, the National Electricity Transmission System must be secured) or loss of import from or sudden export to External Interconnections. NGET will allocate Operating Reserve to the appropriate BM Units and Generating Units so as to fulfil its requirements according to the Ancillary Services available to it and as provided in the BCs.

Inadequate System Margin

(c) In the period following 1200 hours each day and in relation to the following Operational Day, NGET will monitor the total of the Maximum Export Limit component of the Export and Import Limits received against forecast National Electricity Transmission System Demand and the Operating Margin and will take account of Dynamic Parameters to see whether the anticipated level of the System Margin for any period is insufficient.

(d) Where the level of the System Margin for any period is, in NGET's reasonable opinion, anticipated to be insufficient, NGET will send (by such data transmission facilities as have been agreed) a National Electricity Transmission System Warning - Inadequate System Margin in accordance with OC7.4.8 to each Generator, Supplier, Externally Interconnected System Operator, Network Operator and Non-Embedded Customer.

(e) Where, in NGET's judgement the System Margin at any time during the current Operational Day is such that there is a high risk of Demand reduction being instructed, a National Electricity Transmission System Warning - High Risk of Demand Reduction will be issued, in accordance with OC7.4.8.

(f) The monitoring will be conducted on a regular basis and a revised National Electricity Transmission System Warning - Inadequate System Margin or High Risk of Demand Reduction may be sent out from time to time, including within the post Gate Closure phase. This will reflect any changes in Physical Notifications and Export and Import Limits which have been notified to NGET, and will reflect any Demand Control which has also been so notified. This will also reflect generally any changes in the forecast Demand and the relevant Operating Margin.

(g) To reflect changing conditions, a National Electricity Transmission System Warning - Inadequate System Margin may be superseded by a National Electricity Transmission System Warning - High Risk of Demand Reduction and vice-versa.
(h) If the continuing monitoring identifies that the System Margin is anticipated, in NGET's reasonable opinion, to be sufficient for the period for which previously a National Electricity Transmission System Warning had been issued, NGET will send (by such data transmission facilities as have been agreed) a Cancellation of National Electricity Transmission System Warning to each User who had received a National Electricity Transmission System Warning - Inadequate System Margin or High Risk of Demand Reduction for that period. The issue of a Cancellation of National Electricity Transmission System Warning is not an assurance by NGET that in the event the System Margin will be adequate, but reflects NGET's reasonable opinion that the insufficiency is no longer anticipated.

(i) If continued monitoring indicates the System Margin becoming inadequate NGET may issue further National Electricity Transmission System Warnings - Inadequate System Margin or High Risk of Demand Reduction.

(j) NGET may issue a National Electricity Transmission System Warning - Inadequate System Margin or High Risk of Demand Reduction for any period, not necessarily relating to the following Operational Day, where it has reason to believe there will be inadequate System Margin over a period (for example in periods of protracted Plant shortage, the provisions of OC7.4.8.6 apply).

BC1.5.5 System and Localised NRAPM (Negative Reserve Active Power Margin)

(a) (i) System Negative Reserve Active Power Margin

Synchronised Gensets must at all times be capable of reducing output such that the total reduction in output of all Synchronised Gensets is sufficient to offset the loss of the largest secured demand on the System and must be capable of sustaining this response;

(ii) Localised Negative Reserve Active Power Margin

Synchronised Gensets must at all times be capable of reducing output to allow transfers to and from the System Constraint Group (as the case may be) to be contained within such reasonable limit as NGET may determine and must be capable of sustaining this response.

(b) NGET will monitor the total of Physical Notifications of exporting BM Units and Generating Units (where appropriate) received against forecast Demand and, where relevant, the appropriate limit on transfers to and from a System Constraint Group and will take account of Dynamic Parameters and Export and Import Limits received to see whether the level of System NRAPM or Localised NRAPM for any period is likely to be insufficient. In addition, NGET may increase the required margin of System NRAPM or Localised NRAPM to allow for variations in forecast Demand. In the case of System NRAPM, this may be by an amount (in NGET's reasonable discretion) not exceeding five per cent of forecast Demand for the period in question. In the case of Localised NRAPM, this may be by an amount (in NGET's reasonable discretion) not exceeding ten per cent of the forecast Demand for the period in question;

(c) Where the level of System NRAPM or Localised NRAPM for any period is, in NGET's reasonable opinion, likely to be insufficient NGET may contact all Generators in the case of low System NRAPM and may contact Generators
in relation to relevant Gensets in the case of low Localised NRAPM. NGET will raise with each Generator the problems it is anticipating due to low System NRAPM or Localised NRAPM and will discuss whether, in advance of Gate Closure:-

(i) any change is possible in the Physical Notification of a BM Unit which has been notified to NGET; or

(ii) any change is possible to the Physical Notification of a BM Unit within an Existing AGR Plant within the Existing AGR Plant Flexibility Limit;

in relation to periods of low System NRAPM or (as the case may be) low Localised NRAPM. NGET will also notify each Externally Interconnected System Operator of the anticipated low System NRAPM or Localised NRAPM and request assistance in obtaining changes to Physical Notifications from BM Units in that External System.

(d) Following Gate Closure, the procedure of BC2.9.4 will apply.

BC1.6 Special Provisions relating to Network Operators

BC1.6.1 User System Data from Network Operators

(a) By 1000 hours each day each Network Operator will submit to NGET in writing, confirmation or notification of the following in respect of the next Operational Day:

(i) constraints on its User System which NGET may need to take into account in operating the National Electricity Transmission System. In this BC1.6.1 the term "constraints" shall include restrictions on the operation of Embedded CCGT Units, and/or Embedded Power Park Modules as a result of the User System to which the CCGT Unit and/or Power Park Module is connected at the User System Entry Point being operated or switched in a particular way, for example, splitting the relevant busbar. It is a matter for the Network Operator and the Generator to arrange the operation or switching, and to deal with any resulting consequences. The Generator, after consultation with the Network Operator, is responsible for ensuring that no BM Unit Data submitted to NGET can result in the violation of any such constraint on the User System.

(ii) the requirements of voltage control and Mvar reserves which NGET may need to take into account for System security reasons.

(iii) where applicable, updated best estimates of Maximum Export Capacity and Maximum Import Capacity and Interface Point Target Voltage/Power Factor for any Interface Point connected to its User System including any requirement for post-fault actions to be implemented on the relevant Offshore Transmission System by NGET.
(b) The form of the submission will be:

(i) that of a BM Unit output or consumption (for MW and for Mvar, in each case a fixed value or an operating range, on the User System at the User System Entry Point, namely in the case of a BM Unit comprising a Generating Unit (as defined in the Glossary and Definitions and not limited by BC1.2) on the higher voltage side of the generator step-up transformer, or in the case of a Power Park Module, at the point of connection) required for particular BM Units (identified in the submission) connected to that User System for each Settlement Period of the next Operational Day;

(ii) adjusted in each case for MW by the conversion factors applicable for those BM Units to provide output or consumption at the relevant Grid Supply Points.

(c) At any time and from time to time, between 1000 hours each day and the expiry of the next Operational Day, each Network Operator must submit to NGET in writing any revisions to the information submitted under this BC1.6.1.

BC1.6.2 Notification of Times to Network Operators

NGET will make available indicative Synchronising and De-Synchronising times to each Network Operator, but only relating to BM Units comprising a Generating Unit (as defined in the Glossary and Definitions and not limited by BC1.2) or a Power Park Module or a CCGT Module Embedded within that Network Operator's User System and those Gensets directly connected to the National Electricity Transmission System which NGET has identified under OC2 as being those which may, in the reasonable opinion of NGET, affect the integrity of that User System. If in preparing for the operation of the Balancing Mechanism, NGET becomes aware that a BM Unit directly connected to the National Electricity Transmission System may, in its reasonable opinion, affect the integrity of that other User System which, in the case of a BM Unit comprising a Generating Unit (as defined in the Glossary and Definitions and not limited by BC1.2) or a CCGT Module or a Power Park Module, it had not so identified under OC2, then NGET may make available details of its indicative Synchronising and De-Synchronising times to that other User and shall inform the relevant BM Participant that it has done so, identifying the BM Unit concerned.

BC1.7 Special Actions

BC1.7.1 NGET may need to identify special actions (either pre- or post-fault) that need to be taken by specific Users in order to maintain the integrity of the National Electricity Transmission System in accordance with the Licence Standards and NGET Operational Strategy.

(a) For a Generator special actions will generally involve a Load change or a change of required Notice to Deviate from Zero NDZ, in a specific timescale on individual or groups of Gensets.

(b) For Network Operators these special actions will generally involve Load transfers between Grid Supply Points or arrangements for Demand reduction by manual or automatic means.

(c) For Externally Interconnected System Operators (in their co-ordinating role for Interconnector Users using their External System) these special
actions will generally involve an increase or decrease of net power flows across an External Interconnection by either manual or automatic means.

BC1.7.2 These special actions will be discussed and agreed with the relevant User as appropriate. The actual implementation of these special actions may be part of an “emergency circumstances” procedure described under BC2. If not agreed, generation or Demand may be restricted or may be at risk.

BC1.7.3 NGET will normally issue the list of special actions to the relevant Users by 1700 hours on the day prior to the day to which they are to apply.

BC1.8 Provision of Reactive Power capability

BC1.8.1 Under certain operating conditions NGET may identify through its Operational Planning that an area of the National Electricity Transmission System may have insufficient Reactive Power capability available to ensure that the operating voltage can be maintained in accordance with NGET's Licence Standards.

In respect of Onshore Synchronous Generating Unit(s)

(i) that have a CEC in excess of Rated MW (or the CEC of the CCGT module exceeds the sum of Rated MW of the Generating Units comprising the CCGT module); and

(ii) that are not capable of continuous operation at any point between the limits 0.85 Power Factor lagging and 0.95 Power Factor leading at the Onshore Synchronous Generating Unit terminals at Active Power output levels higher than Rated MW; and

(iii) that have either a Completion Date on or after 1st May 2009, or where its CEC has been increased above Rated MW (or the CEC of the CCGT module has increased above the sum of Rated MW of the Generating Units comprising the CCGT module) such increase takes effect on or after 1st May 2009; and

(iv) that are in an area of potentially insufficient Reactive Power capability as described in this clause BC1.8.1,

NGET may instruct the Onshore Synchronous Generating Unit(s) to limit its submitted Physical Notifications to no higher than Rated MW (or the Active Power output at which it can operate continuously between the limits 0.85 Power Factor lagging to 0.95 Power Factor leading at its terminals if this is higher) for a period specified by NGET. Such an instruction must be made at least 1 hour prior to Gate Closure, although NGET will endeavour to give as much notice as possible. The instruction may require that a Physical Notification is re-submitted. The period covered by the instruction will not exceed the expected period for which the potential deficiency has been identified. Compliance with the instruction will not incur costs to NGET in the Balancing Mechanism. The detailed provisions relating to such instructions will normally be set out in the relevant Bilateral Agreement.
APPENDIX 1

BM UNIT DATA

More detail about valid values required under the Grid Code for BM Unit Data and Generating Unit Data may be identified by referring to the Data Validation, Consistency and Defaulting Rules. In the case of Embedded BM Units and Generating Units the BM Unit Data and the Generating Unit Data shall represent the value at the relevant Grid Supply Point. Where data is submitted on a Generating Unit basis, the provisions of this Appendix 1 shall in respect of such data submission apply as if references to BM Unit were replaced with Generating Unit. Where NGET and the relevant User agree, submission on a Generating Unit basis (in whole or in part) may be otherwise than in accordance with the provisions of the Appendix 1.

**BC1.A.1.1 Physical Notifications**

For each BM Unit, the Physical Notification is a series of MW figures and associated times, making up a profile of intended input or output of Active Power at the Grid Entry Point or Grid Supply Point, as appropriate. For each Settlement Period, the first “from time” should be at the start of the Settlement Period and the last “to time” should be at the end of the Settlement Period.

The input or output reflected in the Physical Notification for a single BM Unit (or the aggregate Physical Notifications for a collection of BM Units at a Grid Entry Point or Grid Supply Point or to be transferred across an External Interconnection, owned or controlled by a single BM Participant) must comply with the following limits regarding maximum rates of change, either for a single change or a series of related changes:

- for a change of up to 300MW no limit;
- for a change greater than 300MW and less than 1000MW 50MW per minute;
- for a change of 1000MW or more 40MW per minute,

unless prior arrangements have been discussed and agreed with NGET. This limitation is not intended to limit the Run-Up or Run-Down Rates provided as Dynamic Parameters.

An example of the format of Physical Notification is shown below. The convention to be applied is that where it is proposed that the BM Unit will be importing, the Physical Notification is negative.

<table>
<thead>
<tr>
<th>Data Name</th>
<th>BMU name</th>
<th>Time From</th>
<th>From level (MW)</th>
<th>Time To</th>
<th>To Level (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PN , TAGENT , BMUNIT01</td>
<td>2001-11-03 06:30 , 77</td>
<td>, 2001-11-03 07:00 , 100</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PN , TAGENT , BMUNIT01</td>
<td>2001-11-03 07:00 , 100</td>
<td>, 2001-11-03 07:12 , 150</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PN , TAGENT , BMUNIT01</td>
<td>2001-11-03 07:12 , 150</td>
<td>, 2001-11-03 07:30 , 175</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A linear interpolation will be assumed between the Physical Notification From and To levels specified for the BM Unit by the BM Participant.
**BC1.A.1.2 Quiescent Physical Notifications (QPN)**

For each BM Unit (optional) a series of MW figures and associated times, which describe the MW levels to be deducted from the Physical Notification of a BM Unit to determine a resultant operating level to which the Dynamic Parameters associated with that BM Unit apply.

An example of the format of data is shown below.

<table>
<thead>
<tr>
<th>Data Name</th>
<th>BMU name</th>
<th>Time From</th>
<th>From level (MW)</th>
<th>Time To</th>
<th>To level (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>QPN</td>
<td>TAGENT , BMUNIT04 , 2001-11-03 06:30</td>
<td>-200</td>
<td>2001-11-03 07:00</td>
<td>-220</td>
<td></td>
</tr>
<tr>
<td>QPN</td>
<td>TAGENT , BMUNIT04 , 2001-11-03 07:00</td>
<td>-220</td>
<td>2001-11-03 07:18</td>
<td>-245</td>
<td></td>
</tr>
<tr>
<td>QPN</td>
<td>TAGENT , BMUNIT04 , 2001-11-03 07:18</td>
<td>-245</td>
<td>2001-11-03 07:30</td>
<td>-300</td>
<td></td>
</tr>
</tbody>
</table>

A linear interpolation will be assumed between the QPN From and To levels specified for the BM Unit by the BM Participant.

**BC1.A.1.3 Export and Import Limits**

**BC1.A.1.3.1 Maximum Export Limit (MEL)** A series of MW figures and associated times, making up a profile of the maximum level at which the BM Unit may be exporting (in MW) to the National Electricity Transmission System at the Grid Entry Point or Grid Supply Point, as appropriate.

**BC1.A.1.3.2 Maximum Import Limit (MIL)** A series of MW figures and associated times, making up a profile of the maximum level at which the BM Unit may be importing (in MW) from the National Electricity Transmission System at the Grid Entry Point or Grid Supply Point, as appropriate.

An example format of data is shown below. MEL must be positive or zero, and MIL must be negative or zero.

<table>
<thead>
<tr>
<th>Data Name</th>
<th>BMU name</th>
<th>Time From</th>
<th>From level (MW)</th>
<th>Time To</th>
<th>To level (MW)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEL</td>
<td>TAGENT , BMUNIT01 , 2001-11-03 05:00</td>
<td>410</td>
<td>2001-11-03 09:35</td>
<td>410</td>
<td></td>
</tr>
<tr>
<td>MEL</td>
<td>TAGENT , BMUNIT01 , 2001-11-03 09:35</td>
<td>450</td>
<td>2001-11-03 12:45</td>
<td>450</td>
<td></td>
</tr>
<tr>
<td>MIL</td>
<td>TAGENT , BMUNIT04 , 2001-11-03 06:30</td>
<td>-200</td>
<td>2001-11-03 07:00</td>
<td>-220</td>
<td></td>
</tr>
</tbody>
</table>
**BC1.A.1.4 Bid-Offer Data**

For each **BM Unit** for each **Settlement Period:**

Up to 10 Bid-Offer Pairs as defined in the **BSC.**

An example of the format of data is shown below.

<table>
<thead>
<tr>
<th>Data Name</th>
<th>BMU name</th>
<th>Time from</th>
<th>Time to</th>
<th>Level ID</th>
<th>Level From (MW)</th>
<th>Level To (MW)</th>
<th>Offer (£/ MWhr)</th>
<th>Bid (£/ MWhr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOD, TAGENT ,BMUNIT01 , 2000-10-28 12:00 , 2000-10-28 13:30 , 4 , 30 , 30 , 40 , 35</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOD, TAGENT ,BMUNIT01 , 2000-10-28 12:00 , 2000-10-28 13:30 , 3 , 20 , 20 , 35 , 30</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOD, TAGENT ,BMUNIT01 , 2000-10-28 12:00 , 2000-10-28 13:30 , 2 , 40 , 40 , 32 , 27</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOD, TAGENT ,BMUNIT01 , 2000-10-28 12:00 , 2000-10-28 13:30 , 1 , 50 , 50 , 30 , 25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOD, TAGENT ,BMUNIT01 , 2000-10-28 12:00 , 2000-10-28 13:30 , -1 , -40 , -40 , 25 , 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOD, TAGENT ,BMUNIT01 , 2000-10-28 12:00 , 2000-10-28 13:30 , -2 , -30 , -30 , 23 , 17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This example of Bid-Offer data is illustrated graphically below:-

---

![Final Physical Notification Diagram](image-url)
**BC1.A.1.5 Dynamic Parameters**

The Dynamic Parameters comprise:

- Up to three Run-Up Rate(s) and up to three Run-Down Rate(s), expressed in MW/minute and associated Run-Up Elbow(s) and Run-Down Elbow(s), expressed in MW for output and the same for input. It should be noted that Run-Up Rate(s) are applicable to a MW figure becoming more positive;

- Notice to Deviate from Zero (NDZ) output or input, being the notification time required for a BM Unit to start importing or exporting energy, from a zero Physical Notification level as a result of a Bid-Offer Acceptance, expressed in minutes;

- Notice to Deliver Offers (NTO) and Notice to Deliver Bids (NTB), expressed in minutes, indicating the notification time required for a BM Unit to start delivering Offers and Bids respectively from the time that the Bid-Offer Acceptance is issued. In the case of a BM Unit comprising a Genset, NTO and NTB will be set to a maximum period of two minutes;

- Minimum Zero Time (MZT), being either the minimum time that a BM Unit which has been exporting must operate at zero or be importing, before returning to exporting or the minimum time that a BM Unit which has been importing must operate at zero or be exporting before returning to importing, as a result of a Bid-Offer Acceptance, expressed in minutes;

- Minimum Non-Zero Time (MNZT), expressed in minutes, being the minimum time that a BM Unit can operate at a non-zero level as a result of a Bid-Offer Acceptance;

- Stable Export Limit (SEL) expressed in MW at the Grid Entry Point or Grid Supply Point, as appropriate, being the minimum value at which the BM Unit can, under stable conditions, export to the National Electricity Transmission System;

- Stable Import Limit (SIL) expressed in MW at the Grid Entry Point or Grid Supply Point, as appropriate, being the minimum value at which the BM Unit can, under stable conditions, import from the National Electricity Transmission System;

- Maximum Delivery Volume (MDV), expressed in MWh, being the maximum number of MWhr of Offer (or Bid if MDV is negative) that a particular BM Unit may deliver within the associated Maximum Delivery Period (MDP), expressed in minutes, being the maximum period over which the MDV applies.

**BC1.A.1.6 CCGT Module Matrix**

BC1.A.1.6.1 CCGT Module Matrix showing the combination of CCGT Units running in relation to any given MW output, in the form of the diagram illustrated below. The CCGT Module Matrix is designed to achieve certainty in knowing the number of CCGT Units synchronised to meet the Physical Notification and to achieve a Bid-Offer Acceptance.

BC1.A.1.6.2 In the case of a Range CCGT Module, and if the Generator so wishes, a request for the single Grid Entry Point at which power is provided from the Range CCGT Module to be changed in accordance with the provisions of BC1.A.1.6.4 below:-
### CCGT Module Matrix example form

<table>
<thead>
<tr>
<th>CCGT MODULE ACTIVE POWER</th>
<th>CCGT GENERATING UNITS* AVAILABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW</td>
<td>1st GT</td>
</tr>
<tr>
<td>0MW to 150MW</td>
<td>150</td>
</tr>
<tr>
<td>151MW to 250MW</td>
<td>/</td>
</tr>
<tr>
<td>251MW to 300MW</td>
<td>/</td>
</tr>
<tr>
<td>301MW to 400MW</td>
<td>/</td>
</tr>
<tr>
<td>401MW to 450MW</td>
<td>/</td>
</tr>
<tr>
<td>451MW to 550MW</td>
<td>/</td>
</tr>
</tbody>
</table>

* as defined in the Glossary and Definitions and not limited by BC1.2

**BC1.A.1.6.3** In the absence of the correct submission of a CCGT Module Matrix the last submitted (or deemed submitted) CCGT Module Matrix shall be taken to be the CCGT Module Matrix submitted hereunder.

**BC1.A.1.6.4** The data may also include in the case of a Range CCGT Module, a request for the Grid Entry Point at which the power is provided from the Range CCGT Module to be changed with effect from the beginning of the following Operational Day to another specified single Grid Entry Point (there can be only one) to that being used for the current Operational Day. NGET will respond to this request by 1600 hours on the day of receipt of the request. If NGET agrees to the request (such agreement not to be unreasonably withheld), the Generator will operate the Range CCGT Module in accordance with the request. If NGET does not agree, the Generator will, if it produces power from that Range CCGT Module, continue to provide power from the Range CCGT Module to the Grid Entry Point being used at the time of the request. The request can only be made up to 1100 hours in respect of the following Operational Day. No subsequent request to change can be made after 1100 hours in respect of the following Operational Day. Nothing in this paragraph shall prevent the busbar at the Grid Entry Point being operated in separate sections.

**BC1.A.1.6.5** The principles set out in PC.A.3.2.3 apply to the submission of a CCGT Module Matrix and accordingly the CCGT Module Matrix can only be amended as follows:-

(a) **Normal CCGT Module**

    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 NGET 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) Range CCGT Module

If the CCGT Module is a Range CCGT Module, the CCGT Units within that CCGT Module can only be amended such that the CCGT Module comprises different CCGT Units for a particular Operational Day if the relevant notification is given by 1100 hours on the day prior to the Operational Day in which the amendment is to take effect. No subsequent amendment may be made to the CCGT Units comprising the CCGT Module in respect of that particular Operational Day.

BC1.A.1.6.6 In the case of a CCGT Module Matrix submitted (or deemed to be submitted) as part of the other data for CCGT Modules, the output of the CCGT Module at any given instructed MW output must reflect the details given in the CCGT Module Matrix. It is accepted that in cases of change in MW in response to instructions issued by NGET there may be a transitional variance to the conditions reflected in the CCGT Module Matrix. In achieving an instruction the range of number of CCGT Units envisaged in moving from one MW output level to the other must not be departed from. Each Generator shall notify NGET as soon as practicable after the event of any such variance. It should be noted that there is a provision above for the Generator to revise the CCGT Module Matrix, subject always to the other provisions of this BC1;

BC1.A.1.6.7 Subject as provided above, NGET will rely on the CCGT Units specified in such CCGT Module Matrix running as indicated in the CCGT Module Matrix when it issues an instruction in respect of the CCGT Module;

BC1.A.1.6.8 Subject as provided in BC1.A.1.6.5 above, any changes to the CCGT Module Matrix must be notified immediately to NGET in accordance with the relevant provisions of BC1.

BC1.A.1.7 Cascade Hydro Scheme Matrix

BC1.A.1.7.1 A Cascade Hydro Scheme Matrix showing the performance of individual Generating Units forming part of a Cascade Hydro Scheme in response to Bid-Offer Acceptance. An example table is shown below:

Cascade Hydro Scheme Matrix example form

<table>
<thead>
<tr>
<th>Plant</th>
<th>Synchronises when offer is greater than.........</th>
</tr>
</thead>
<tbody>
<tr>
<td>Generating Unit 1</td>
<td>.....MW</td>
</tr>
<tr>
<td>Generating Unit 2</td>
<td>.....MW</td>
</tr>
<tr>
<td>Generating Unit 3</td>
<td>.....MW</td>
</tr>
<tr>
<td>Generating Unit 4</td>
<td>.....MW</td>
</tr>
<tr>
<td>Generating Unit 5</td>
<td>.....MW</td>
</tr>
</tbody>
</table>

BC1.A.1.8 Power Park Module Availability Matrix

BC1.A.1.8.1 Power Park Module Availability Matrix showing the number of each type of Power Park Units expected to be available is illustrated in the example form below. The Power Park Module Availability Matrix is designed to achieve certainty in knowing the number of Power Park Units Synchronised to meet the Physical Notification and to achieve a Bid-Offer Acceptance. The Power Park Module Availability Matrix may have as many columns as are required to provide information on the different make and model for each type of Power Park Unit in a Power Park.
Module. The description is required to assist identification of the Power Park Units within the Power Park Module and correlation with data provided under the Planning Code.

Power Park Module Availability Matrix example form

<table>
<thead>
<tr>
<th>POWER PARK UNIT AVAILABILITY</th>
<th>POWER PARK UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>Type A</td>
</tr>
<tr>
<td>(Make/Model)</td>
<td></td>
</tr>
<tr>
<td>Number of units</td>
<td></td>
</tr>
</tbody>
</table>

BC1.A.1.8.2 In the absence of the correct submission of a Power Park Module Availability Matrix the last submitted (or deemed submitted) Power Park Module Availability Matrix shall be taken to be the Power Park Module Availability Matrix submitted hereunder.

BC1.A.1.8.3 NGET will rely on the Power Park Units specified in such Power Park Module Availability Matrix running as indicated in the Power Park Module Availability Matrix when it issues an instruction in respect of the Power Park Module;

BC1.A.1.8.4 Subject as provided in PC.A.3.2.4 any changes to the Power Park Module Availability Matrix must be notified immediately to NGET in accordance with the relevant provisions of BC1.
APPENDIX 2

DATA TO BE MADE AVAILABLE BY NGET

BC1.A.2.1 Initial Day Ahead Demand Forecast

Normally by 09:00 hours each day, values (in MW) for each Settlement Period of the next following Operational Day of the following data items:-

i) Initial forecast of National Demand;

ii) Initial forecast of Demand for a number of predetermined constraint groups.

BC1.A.2.2 Initial Day Ahead Market Information

Normally by 12:00 hours each day, values (in MW) for each Settlement Period of the next following Operational Day of the following data items:-

i) Initial National Indicated Margin

This is the difference between the sum of BM Unit MELs and the forecast of National Electricity Transmission System Demand.

ii) Initial National Indicated Imbalance

This is the difference between the sum of Physical Notifications for BM Units comprising Generating Units (as defined in the Glossary and Definitions and not limited by BC1.2) or CCGT Modules or Power Park Modules and the forecast of National Electricity Transmission System Demand.

iii) Forecast of National Electricity Transmission System Demand.

BC1.A.2.3 Current Day and Day Ahead Updated Market Information

Data will normally be made available by the times shown below for the associated periods of time:

<table>
<thead>
<tr>
<th>Target Data Release Time</th>
<th>Period Start Time</th>
<th>Period End Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>02:00</td>
<td>02:00 D0</td>
<td>05:00 D+1</td>
</tr>
<tr>
<td>10:00</td>
<td>10:00 D0</td>
<td>05:00 D+1</td>
</tr>
<tr>
<td>16:00</td>
<td>05:00 D+1</td>
<td>05:00 D+2</td>
</tr>
<tr>
<td>16:30</td>
<td>16:30 D0</td>
<td>05:00 D+1</td>
</tr>
<tr>
<td>22:00</td>
<td>22:00 D0</td>
<td>05:00 D+2</td>
</tr>
</tbody>
</table>

In this table, D0 refers to the current day, D+1 refers to the next day and D+2 refers to the day following D+1.

In all cases, data will be ½ hourly average MW values calculated by NGET. Information to be released includes:-

National Information

i) National Indicated Margin;
ii) National Indicated Imbalance;

iii) Updated forecast of National Electricity Transmission System Demand.

Constraint Boundary Information (for each Constraint Boundary)

i) Indicated Constraint Boundary Margin;

This is the difference between the Constraint Boundary Transfer limit and the difference between the sum of BM Unit MELs and the forecast of local Demand within the constraint boundary.

ii) Local Indicated Imbalance;

This is the difference between the sum of Physical Notifications for BM Units comprising Generating Units (as defined in the Glossary and Definitions and not limited by BC1.2) or CCGT Modules or Power Park Modules and the forecast of local Demand within the constraint boundary.

iii) Updated forecast of the local Demand within the constraint boundary.

< End of BC1 >
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(This contents page does not form part of the Grid Code)

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<td></td>
</tr>
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BALANCING CODE No 2
POST GATE CLOSURE PROCESS

BC2.1 INTRODUCTION

Balancing Code No 2 (BC2) sets out the procedure for:

a) the physical operation of BM Units and Generating Units in the absence of any instructions from NGET;

b) the acceptance by NGET of Balancing Mechanism Bids and Offers,

c) the calling off by NGET of Ancillary Services;

d) the issuing and implementation of Emergency Instructions; and

e) the issuing by NGET of other operational instructions and notifications.

In addition, BC2 deals with any information exchange between NGET and BM Participants or specific Users that takes place after Gate Closure.

In this BC2, “consistent” shall be construed as meaning to the nearest integer MW level.

In this BC2, references to “a BM Unit returning to its Physical Notification” shall take account of any Bid-Offer Acceptances already issued to the BM Unit in accordance with BC2.7 and any Emergency Instructions already issued to the BM Unit or Generating Unit in accordance with BC2.9.

BC2.2 OBJECTIVE

The procedure covering the operation of the Balancing Mechanism and the issuing of instructions to Users is intended to enable NGET as far as possible to maintain the integrity of the National Electricity Transmission System together with the security and quality of supply.

Where reference is made in this BC2 to Generating Units (unless otherwise stated) it only applies:

(a) to each Generating Unit which forms part of the BM Unit of a Cascade Hydro Scheme; and

(b) at an Embedded Exemptable Large Power Station where the relevant Bilateral Agreement specifies that compliance with BC2 is required:

i) to each Generating Unit, or

ii) to each Power Park Module where the Power Station comprises Power Park Modules.
BC2.3 SCOPE

BC2 applies to NGET and to Users, which in this BC2 means:-

(a) BM Participants;
(b) Externally Interconnected System Operators, and
(c) Network Operators.

BC2.4 INFORMATION USED

BC2.4.1 The information which NGET shall use, together with the other information available to it, in assessing:-

(a) which bids and offers to accept;
(b) which BM Units and/or Generating Units to instruct to provide Ancillary Services;
(c) the need for and formulation of Emergency Instructions; and
(d) other operational instructions and notifications which NGET may need to issue will be:

(a) the Physical Notification and Bid-Offer Data submitted under BC1;
(b) Export and Import Limits, QPNs, and Joint BM Unit Data in respect of that BM Unit and/or Generating Unit supplied under BC1 (and any revisions under BC1 and BC2 to the data); and
(c) Dynamic Parameters submitted or revised under this BC2.

BC2.4.2 As provided for in BC1.5.4, NGET will monitor the total of the Maximum Export Limit component of the Export and Import Limits against forecast Demand and the Operating Margin and will take account of Dynamic Parameters to see whether the anticipated level of System Margin is insufficient. This will reflect any changes in Export and Import Limits which have been notified to NGET, and will reflect any Demand Control which has also been so notified. NGET may issue new or revised National Electricity Transmission System Warnings – Inadequate System Margin or High Risk of Demand Reduction in accordance with BC1.5.4.

BC2.5 PHYSICAL OPERATION OF BM UNITS

BC2.5.1 Accuracy of Physical Notifications

As described in BC1.4.2(a), Physical Notifications must represent the BM Participant’s best estimate of expected input or output of Active Power and shall be prepared in accordance with Good Industry Practice. Each BM Participant must, applying Good Industry Practice, ensure that each of its BM Units follows the Physical Notification in respect of that BM Unit (and each of its Generating Units follows the Physical Notification in the case of Physical Notifications supplied under BC1.4.2(a)(2)) prevailing at Gate Closure (the data in which will be utilised in producing the Final Physical Notification Data in accordance with the BSC) subject to:
(a) variations arising from the issue of Bid-Offer Acceptances which have been confirmed by the BM Participant; instructions by NGET in relation to that BM Unit (or a Generating Unit) which require, or compliance with which would result in, a variation in output or input of that BM Unit (or a Generating Unit); or

(b) any variations arising from compliance with provisions of BC1, BC2 or BC3 which provide to the contrary,

(which in each case gives rise to an obligation (applying Good Industry Practice) to follow such Physical Notification as amended by such variations and/or instructions), unless in relation to any such obligation it is prevented from so doing as a result of an unavoidable event (existing or anticipated) in relation to that BM Unit (or a Generating Unit) which requires a variation in output or input of that BM Unit (or a Generating Unit). Examples (on a non-exhaustive basis) of such an unavoidable event are plant breakdowns, events requiring a variation of input or output on safety grounds (relating to personnel or plant), events requiring a variation of input or output to maintain compliance with the relevant Statutory Water Management obligations and uncontrollable variations of input of Active Power.

Any anticipated variation in input or output from the Physical Notification in respect of that BM Unit (or a Generating Unit) prevailing at Gate Closure (except for variations arising from the issue of Bid-Offer Acceptances or instructions by NGET as outlined above) for any BM Unit (or a Generating Unit) post Gate Closure must be notified to NGET without delay by the relevant BM Participant (or the relevant person on its behalf). Implementation of this notification should normally be achieved by the submission of revisions to the Export and Import Limits in accordance with BC2.5.3 below.

BC2.5.2 Synchronising and De-Synchronising times

BC2.5.2.1 The Final Physical Notification Data provides indicative Synchronising and De-Synchronising times to NGET in respect of any BM Unit which is De-Synchronising or is anticipated to be Synchronising post Gate Closure.

Any delay of greater than five minutes to the Synchronising or any advancement of greater than five minutes to the De-Synchronising of a BM Unit must be notified to NGET without delay by the submission of a revision of the Export and Import Limits.

BC2.5.2.2 Except in the circumstances provided for in BC2.5.2.3, BC2.5.2.4, BC2.5.5.1 or BC2.9, no BM Unit (nor a Generating Unit) is to be Synchronised or De-Synchronised unless:-

(a) a Physical Notification had been submitted to NGET prior to Gate Closure indicating that a Synchronisation or De-Synchronisation is to occur; or

(b) NGET has issued a Bid-Offer Acceptance requiring Synchronisation or De-Synchronisation of that BM Unit (or a Generating Unit).

BC2.5.2.3 BM Participants must only Synchronise or De-Synchronise BM Units (or a Generating Unit);

(a) at the times indicated to NGET, or
(b) at times consistent with variations in output or input arising from provisions described in BC2.5.1,

(within a tolerance of +/- 5 minutes) or unless that occurs automatically as a result of Operational Intertripping or Low Frequency Relay operations or an Ancillary Service pursuant to an Ancillary Services Agreement

BC2.5.2.4 De-Synchronisation may also take place without prior notification to NGET as a result of plant breakdowns or if it is done purely on safety grounds (relating to personnel or plant). If that happens NGET must be informed immediately that it has taken place and a revision to Export and Import Limits must be submitted in accordance with BC2.5.3.3. Following any De-Synchronisation occurring as a result of plant failure, no Synchronisation of that BM Unit (or a Generating Unit) is to take place without NGET’s agreement, such agreement not to be unreasonably withheld.

In the case of Synchronisation following an unplanned De-Synchronisation within the preceding 15 minutes, a minimum of 5 minutes notice of its intention to Synchronise should normally be given to NGET (via a revision to Export and Import Limits). In the case of any other unplanned De-Synchronisation where the User plans to Synchronise before the expiry of the current Balancing Mechanism period, a minimum of 15 minutes notice of Synchronisation should normally be given to NGET (via a revision to Export and Import Limits). In addition, the rate at which the BM Unit is returned to its Physical Notification is not to exceed the limits specified in BC1, Appendix 1 without NGET’s agreement.

NGET will either agree to the Synchronisation or issue a Bid-Offer Acceptance in accordance with BC2.7 to delay the Synchronisation. NGET may agree to an earlier Synchronisation if System conditions allow.

BC2.5.2.5 Notification of Times to Network Operators

NGET will make changes to the Synchronising and De-Synchronising times available to each Network Operator, but only relating to BM Units Embedded within its User System and those BM Units directly connected to the National Electricity Transmission System which NGET has identified under OC2 and/or BC1 as being those which may, in the reasonable opinion of NGET, affect the integrity of that User System and shall inform the relevant BM Participant that it has done so, identifying the BM Unit concerned.

Each Network Operator must notify NGET of any changes to its User System Data as soon as practicable in accordance with BC1.6.1(c).

BC2.5.3 Revisions to BM Unit Data

Following Gate Closure for any Settlement Period, no changes to the Physical Notification, to the QPN data or to Bid-Offer Data for that Settlement Period may be submitted to NGET.

BC2.5.3.1 At any time, any BM Participant (or the relevant person on its behalf) may, in respect of any of its BM Units, submit to NGET the data listed in BC1, Appendix 1 under the heading of Dynamic Parameters from the Control Point of its BM Unit to amend the data already held by NGET (including that previously submitted under this BC2.5.3.1) for use in preparing for and operating the Balancing Mechanism. The change will take effect from the time that it is received by NGET. For the avoidance of doubt, the Dynamic Parameters submitted to NGET under BC1.4.2(e) are not used within the current Operational Day. The Dynamic Parameters submitted
under this BC2.5.3.1 shall reasonably reflect the true current operating characteristics of the BM Unit and shall be prepared in accordance with Good Industry Practice.

Following the Operational Intertripping of a System to Generating Unit or a System to CCGT Module, the BM Participant shall as soon as reasonably practicable re-declare its MEL to reflect more accurately its output capability.

BC2.5.3.2 Revisions to Export and Import Limits or Other Relevant Data supplied (or revised) under BC1 must be notified to NGET without delay as soon as any change becomes apparent to the BM Participant (or the relevant person on its behalf) via the Control Point for the BM Unit (or a Generating Unit) to ensure that an accurate assessment of BM Unit (or a Generating Unit) capability is available to NGET at all times. These revisions should be prepared in accordance with Good Industry Practice and may be submitted by use of electronic data communication facilities or by telephone.

BC2.5.3.3 Revisions to Export and Import Limits must be made by a BM Participant (or the relevant person on its behalf) via the Control Point in the event of any De-Synchronisation of a BM Unit (or a Generating Unit) in the circumstances described in BC2.5.2.4 if the BM Unit (or a Generating Unit) is no longer available for any period of time. Revisions must also be submitted in the event of plant failures causing a reduction in input or output of a BM Unit (or a Generating Unit) even if that does not lead to De-Synchronisation. Following the correction of a plant failure, the BM Participant (or the relevant person on its behalf) must notify NGET via the Control Point of a revision to the Export and Import Limits, if appropriate, of the BM Unit (or a Generating Unit) is returned to its Physical Notification. The rate at which the BM Unit (or a Generating Unit) is returned to its Physical Notification is not to exceed the limits specified in BC1, Appendix 1 without NGET's agreement.

BC2.5.4 Operation in the absence of instructions from NGET

In the absence of any Bid-Offer Acceptances, Ancillary Service instructions issued pursuant to BC2.8 or Emergency Instructions issued pursuant to BC2.9:

(a) as provided for in BC3, each Synchronised Genset producing Active Power must operate at all times in Limited Frequency Sensitive Mode (unless instructed in accordance with BC3.5.4 to operate in Frequency Sensitive Mode);

(b) (i) in the absence of any Mvar Ancillary Service instructions, the Mvar output of each Synchronised Genset located Onshore should be 0 Mvar upon Synchronisation at the circuit-breaker where the Genset is Synchronised. For the avoidance of doubt, in the case of a Genset located Onshore comprising of Non-Synchronous Generating Units, Power Park Modules or DC Converters the steady state tolerance allowed in CC.6.3.2(b) may be applied;

(ii) In the absence of any Mvar Ancillary Service instructions, the Mvar output of each Synchronised Genset comprising Synchronous Generating Units located Offshore should be 0MVAr at the Grid Entry Point upon Synchronisation. For the avoidance of doubt, in the case of a Genset located Offshore comprising of Non-Synchronous Generating Units, Power Park Modules or DC Converters the steady state tolerance allowed in CC.6.3.2(e) may be applied;
(c) (i) subject to the provisions of 2.5.4(c) (ii) and 2.5.4 (c) (iii) below, the excitation system or the voltage control system of a Genset located Offshore which has agreed an alternative Reactive Power capability range under CC.6.3.2 (e) (iii) or a Genset located Onshore, unless otherwise agreed with NGET, must be operated only in its constant terminal voltage mode of operation with VAR limiters in service, with any constant Reactive Power output control mode or constant Power Factor output control mode always disabled, unless agreed otherwise with NGET. In the event of any change in System voltage, a Generator must not take any action to override automatic Mvar response which is produced as a result of constant terminal voltage mode of operation of the automatic excitation control system unless instructed otherwise by NGET or unless immediate action is necessary to comply with Stability Limits or unless constrained by plant operational limits or safety grounds (relating to personnel or plant);

(ii) In the case of all Gensets comprising Non-Synchronous Generating Units, DC Converters and Power Park Modules that are located Offshore and which have agreed an alternative Reactive Power capability range under CC.6.3.2 (e) (iii), or that are located Onshore only when operating below 20 % of the Rated MW output, the voltage control system shall maintain the reactive power transfer at the Grid Entry Point (or User System Entry Point if Embedded) to 0 MVAr. For the avoidance of doubt the relevant steady state tolerance allowed in CC.6.3.2(b) or CC.6.3.2 (e) may be applied. In the case of any such Gensets comprising current source DC Converter technology or comprising Power Park Modules connected to the Total System by a current source DC Converter when operating at any power output the voltage control system shall maintain the reactive power transfer at the Grid Entry Point (or User System Entry Point if Embedded) to 0 MVAr. For the avoidance of doubt the relevant steady state tolerance allowed in CC.6.3.2(b) or CC.6.3.2 (c) (i) may be applied.

(iii) In the case of all Gensets located Offshore which are not subject to the requirements of BC2.5.4 (c) (i) or BC2.5.4 (c) (ii) the control system shall maintain the Reactive Power transfer at the Offshore Grid Entry Point at 0MVAr. For the avoidance of doubt the steady state tolerance allowed by CC.6.3.2 (e) may be applied.

(d) In the absence of any Mvar Ancillary Service instructions,

(i) the Mvar output of each Genset located Onshore should be 0 Mvar immediately prior to De-Synchronisation at the circuit-breaker where the Genset is Synchronised, other than in the case of a rapid unplanned De-Synchronisation or in the case of a Genset comprising of Non-Synchronous Generating Units, Power Park Modules or DC Converters which is operating at less than 20% of its Rated MW output where the requirements of BC2.5.4 (c) part (ii) apply, or;
(ii) the MVAR output of each Genset located Offshore should be 0MVAR immediately prior to De-Synchronisation at the Offshore Grid Entry Point, other than in the case of a rapid unplanned De-Synchronisation or in the case of a Genset comprising of Non-Synchronous Generating Units, Power Park Modules or DC Converters which is operating at less than 20% of its Rated MW output and which has agreed an alternative Reactive Power capability range under CC.6.3.2 (e) (iii) where the requirements of BC2.5.4 (c) (ii) apply.

(e) a Generator should at all times operate its CCGT Units in accordance with the applicable CCGT Module Matrix;

(f) in the case of a Range CCGT Module, a Generator must operate that CCGT Module so that power is provided at the single Grid Entry Point identified in the data given pursuant to PC.A.3.2.1 or at the single Grid Entry Point to which NGET has agreed pursuant to BC1.4.2(f);

(g) in the event of the System Frequency being above 50.3Hz or below 49.7Hz, BM Participants must not commence any reasonably avoidable action to regulate the input or output of any BM Unit in a manner that could
cause the **System Frequency** to deviate further from 50Hz without first using reasonable endeavours to discuss the proposed actions with NGET. NGET shall either agree to these changes in input or output or issue a **Bid-Offer Acceptance** in accordance with BC2.7 to delay the change.

(h) a **Generator** should at all times operate its **Power Park Units** in accordance with the applicable **Power Park Module Availability Matrix**.

**BC2.5.5** Commencement or Termination of Participation in the **Balancing Mechanism**

**BC2.5.5.1** In the event that a **BM Participant** in respect of a **BM Unit** with a **Demand Capacity** with a magnitude of less than 50MW in **NGET's Transmission Area** or less than 10MW in **SHETL's Transmission Area** or less than 30MW in **SPT's Transmission Area** or comprising **Generating Units** (as defined in the Glossary and Definitions and not limited by BC2.2) and/or **CCGT Modules** and/or **Power Park Modules** at a **Small Power Station** notifies NGET at least 30 days in advance that from a specified **Operational Day** it will:

(a) no longer submit **Bid-Offer Data** under BC1.4.2(d), then with effect from that **Operational Day** that **BM Participant** no longer has to meet the requirements of BC2.5.1 nor the requirements of CC6.5.8(b) in relation to that **BM Unit**. Also, with effect from that **Operational Day**, any defaulted **Physical Notification** and defaulted **Bid-Offer Data** in relation to that **BM Unit** arising from the **Data Validation, Consistency and Defaulting Rules** will be disregarded and the provisions of BC2.5.2 will not apply;

(b) submit **Bid-Offer Data** under BC1.4.2(d), then with effect from that **Operational Day** that **BM Participant** will need to meet the requirements of BC2.5.1 and the requirements of CC6.5.8(b) in relation to that **BM Unit**.

**BC2.5.5.2** In the event that a **BM Participant** in respect of a **BM Unit** with a **Demand Capacity** with a magnitude of 50MW or more in **NGET's Transmission Area** or 10MW or more in **SHETL's Transmission Area** or 30MW or more in **SPT's Transmission Area** or comprising **Generating Units** (as defined in the Glossary and Definitions and not limited by BC2.2) and/or **CCGT Modules** and/or **Power Park Modules** at a **Medium Power Station** or **Large Power Station** notifies NGET at least 30 days in advance that from a specified **Operational Day** it will:

(a) no longer submit **Bid-Offer Data** under BC1.4.2(d), then with effect from that **Operational Day** that **BM Participant** no longer has to meet the requirements of CC6.5.8(b) in relation to that **BM Unit**; Also, with effect from that **Operational Day**, any defaulted **Bid-Offer Data** in relation to that **BM Unit** arising from the **Data Validation, Consistency and Defaulting Rules** will be disregarded;

(b) submit **Bid-Offer Data** under BC1.4.2(d), then with effect from that **Operational Day** that **BM Participant** will need to meet the requirements of CC6.5.8(b) in relation to that **BM Unit**.

**BC2.6** **COMMUNICATIONS**

Electronic communications are always conducted in GMT. However, the input of data and display of information to **Users** and **NGET** and all other communications are conducted in London time.
BC2.6.1 Normal Communication with Control Points

(a) With the exception of BC2.6.1(c) below, Bid-Offer Acceptances and Ancillary Service instructions shall be given by automatic logging device and will be given to the Control Point for the BM Unit. For all Planned Maintenance Outages the provisions of BC2.6.5 will apply. For Generating Units communications under BC2 shall be by telephone unless otherwise agreed by NGET and the User.

(b) Bid-Offer Acceptances and Ancillary Service instructions must be formally acknowledged immediately by the BM Participant (or the relevant person on its behalf) via the Control Point for the BM Unit or Generating Unit in respect of that BM Unit or that Generating Unit. The acknowledgement and subsequent confirmation or rejection, within two minutes of receipt, is normally given electronically by automatic logging device. If no confirmation or rejection is received by NGET within two minutes of the issue of the Bid-Offer Acceptance, then NGET will contact the Control Point for the BM Unit by telephone to determine the reason for the lack of confirmation or rejection. Any rejection must be given in accordance with BC2.7.3 or BC2.8.3.

(c) In the event of a failure of the logging device or a NGET computer system outage, Bid-Offer Acceptances and instructions will be given, acknowledged, and confirmed or rejected by telephone. The provisions of BC2.9.7 are also applicable.

(d) In the event that in carrying out the Bid-Offer Acceptances or providing the Ancillary Services, or when operating at the level of the Final Physical Notification Data as provided in BC2.5.1, an unforeseen problem arises, caused on safety grounds (relating to personnel or plant), NGET must be notified without delay by telephone.

(e) The provisions of BC2.5.3 are also relevant.

(f) Submissions of revised Mvar capability may be made by facsimile transmission, using the format given in Appendix 3 to BC2.

(g) Communication will normally be by telephone for any purpose other than Bid-Offer Acceptances, in relation to Ancillary Services or for revisions of Mvar Data.

(h) Submissions of revised availability of Frequency Sensitive Mode may be made by facsimile transmission, using the format given in Appendix 4 to BC2. This process should only be used for technical restrictions to the availability of Frequency Sensitive Mode.

BC2.6.2 Communication with Control Points in Emergency Circumstances

NGET will issue Emergency Instructions direct to the Control Point for each BM Unit [or Generating Unit] in Great Britain. Emergency Instructions to a Control Point will normally be given by telephone (and will include an exchange of operator names).

BC2.6.3 Communication with Network Operators in Emergency Circumstances

NGET will issue Emergency Instructions direct to the Network Operator at each Control Centre in relation to special actions and Demand Control. Emergency Instructions to a Network Operator will normally be given by telephone (and will
include an exchange of operator names). **OC6** contains further provisions relating to **Demand Control** instructions.

**BC2.6.4 Communication with Externally Interconnected System Operators in Emergency Circumstances**

**NGET** will issue **Emergency Instructions** directly to the **Externally Interconnected System Operator** at each **Control Centre**. **Emergency Instructions** to an **Externally Interconnected System Operator** will normally be given by telephone (and will include an exchange of operator names).

**BC2.6.5 Communications during planned outages of electronic data communication facilities**

**Planned Maintenance Outages** will normally be arranged to take place during periods of low data transfer activity. Upon any such **Planned Maintenance Outage** in relation to a post **Gate Closure** period:-

(a) **BM Participants** should operate in relation to any period of time in accordance with the **Physical Notification** prevailing at **Gate Closure** current at the time of the start of the **Planned Maintenance Outage** in relation to each such period of time. Such operation shall be subject to the provisions of **BC2.5.1**, which will apply as if set out in this **BC2.6.5**. No further submissions of **BM Unit Data** (other than data specified in **BC1.4.2(c)** and **BC1.4.2(e)**) should be attempted or **Generating Unit Data**. Plant failure or similar problems causing significant deviation from **Physical Notification** should be notified to **NGET** by the submission of a revision to **Export and Import Limits** in relation to the **BM Unit** or **Generating Unit** so affected;

(b) during the outage, revisions to the data specified in **BC1.4.2(c)** and **BC1.4.2(e)** may be submitted. Communication between **Users’ Control Points** and **NGET** during the outage will be conducted by telephone;

(c) **NGET** will issue **Bid-Offer Acceptances** by telephone; and

(d) no data will be transferred from **NGET** to the **BMRA** until the communication facilities are re-established.

(e) The provisions of **BC2.9.7** may also be relevant.

**BC2.7 BID-OFFER ACCEPTANCES**

**BC2.7.1 Acceptance of bids and offers by NGET**

**Bid-Offer Acceptances** may be issued to the **Control Point** at any time following **Gate Closure**. Any **Bid-Offer Acceptance** will be consistent with the **Dynamic Parameters**, **QPNs**, **Export and Import Limits**, and **Joint BM Unit Data** of the **BM Unit** in so far as the **Balancing Mechanism** timescales will allow (see **BC2.7.2**).

(a) **NGET** is entitled to assume that each **BM Unit** is available in accordance with the **BM Unit Data** submitted unless and until it is informed of any changes.

(b) **Bid-Offer Acceptances** sent to the **Control Point** will specify the data necessary to define a MW profile to be provided (ramp rate break-points are not normally explicitly sent to the **Control Point**) and to be achieved consistent with the respective **BM Unit’s Export and Import Limits**, **QPNs** and **Joint BM Unit Data** provided or modified under **BC1** or **BC2**, and
Dynamic Parameters given under BC2.5.3 or, if agreed with the relevant User, such rate within those Dynamic Parameters as is specified by NGET in the Bid-Offer Acceptances.

(c) All Bid-Offer Acceptances will be deemed to be at the current "Target Frequency", namely where a Genset is in Frequency Sensitive Mode they refer to target output at Target Frequency.

(d) The form of and terms to be used by NGET in issuing Bid-Offer Acceptances together with their meanings are set out in Appendix 1 in the form of a non-exhaustive list of examples.

BC2.7.2 Consistency with Export and Import Limits, QPNs and Dynamic Parameters

(a) Bid-Offer Acceptances will be consistent with the Export and Import Limits, QPNs, and Joint BM Unit Data provided or modified under BC1 or BC2 and the Dynamic Parameters provided or modified under BC2. Bid-Offer Acceptances may also recognise Other Relevant Data provided or modified under BC1 or BC2.

(b) In the case of consistency with Dynamic Parameters this will be limited to the time until the end of the Settlement Period for which Gate Closure has most recently occurred. If NGET intends to issue a Bid-Offer Acceptance covering a period after the end of the Settlement Period for which Gate Closure has most recently occurred, based upon the then submitted Dynamic Parameters, QPN's, Export and Import Limits, Bid-Offer Data and Joint BM Unit Data applicable to that period, NGET will indicate this to the BM Participant at the Control Point for the BM Unit. The intention will then be reflected in the issue of a Bid-Offer Acceptance to return the BM Unit to its previously notified Physical Notification after the relevant Gate Closure provided the submitted data used to formulate this intention has not changed and subject to System conditions which may affect that intention. Subject to that, assumptions regarding Bid-Offer Acceptances may be made by BM Participants for Settlement Periods for which Gate Closure has not yet occurred when assessing consistency with Dynamic Parameters in Settlement Periods for which Gate Closure has occurred. If no such subsequent Bid–Offer Acceptance is issued, the original Bid-Offer Acceptance will include an instantaneous return to Physical Notification at the end of the Balancing Mechanism period.

BC2.7.3 Confirmation and Rejection of Acceptances

Bid-Offer Acceptances may only be rejected by a BM Participant :-

(a) on safety grounds (relating to personnel or plant) as soon as reasonably possible and in any event within five minutes; or

(b) because they are not consistent with the Export and Import Limits, QPNs, Dynamic Parameters or Joint BM Unit Data applicable at the time of issue of the Bid-Offer Acceptance.

A reason must always be given for rejection by telephone.
Where a Bid-Offer Acceptance is not confirmed within two minutes or is rejected, NGET will seek to contact the Control Point for the BM Unit. NGET must then, within 15 minutes of issuing the Bid-Offer Acceptance, withdraw the Bid-Offer Acceptance or log the Bid-Offer Acceptance as confirmed. NGET will only log a rejected Bid-Offer Acceptance as confirmed following discussion and if the reason given is, in NGET’s reasonable opinion, not acceptable and NGET will inform the BM Participant accordingly.

BC2.7.4 Action Required from BM Participants

(a) Each BM Participant in respect of its BM Units will comply in accordance with BC2.7.1 with all Bid-Offer Acceptances given by NGET with no more than the delay allowed for by the Dynamic Parameters unless the BM Unit has given notice to NGET under the provisions of BC2.7.3 regarding non-acceptance of a Bid-Offer Acceptance.

(b) Where a BM Unit's input or output changes in accordance with a Bid-Offer Acceptance issued under BC2.7.1, such variation does not need to be notified to NGET in accordance with BC2.5.1.

(c) In the event that while carrying out the Bid-Offer Acceptance an unforeseen problem arises caused by safety reasons (relating to personnel or plant), NGET must be notified immediately by telephone and this may lead to revision of BM Unit Data in accordance with BC2.5.3

BC2.7.5 Additional Action Required from Generators

(a) When complying with Bid-Offer Acceptances for a CCGT Module a Generator will operate its CCGT Units in accordance with the applicable CCGT Module Matrix.

(b) When complying with Bid-Offer Acceptances for a CCGT Module which is a Range CCGT Module, a Generator must operate that CCGT Module so that power is provided at the single Grid Entry Point identified in the data given pursuant to PC.A.3.2.1 or at the single Grid Entry Point to which NGET has agreed pursuant to BC1.4.2 (f).

(c) On receiving a new MW Bid-Offer Acceptance, no tap changing shall be carried out to change the Mvar output unless there is a new Mvar Ancillary Service instruction issued pursuant to BC2.8.

(d) When complying with Bid-Offer Acceptances for a Power Park Module a Generator will operate its Power Park Units in accordance with the applicable Power Park Module Availability Matrix.

BC2.8 ANCILLARY SERVICES

This section primarily covers the call-off of System Ancillary Services. The provisions relating to Commercial Ancillary Services will normally be covered in the relevant Ancillary Services Agreement.

BC2.8.1 Call-off of Ancillary Services by NGET

(a) Ancillary Service instructions may be issued at any time.
(b) NGET is entitled to assume that each BM Unit (or Generating Unit) is available in accordance with the BM Unit Data (or the Generating Unit Data) and data contained in the Ancillary Services Agreement unless and until it is informed of any changes.

(c) Frequency control instructions may be issued in conjunction with, or separate from, a Bid-Offer Acceptance.

(d) The form of and terms to be used by NGET in issuing Ancillary Service instructions together with their meanings are set out in Appendix 2 in the form of a non-exhaustive list of examples including Reactive Power and associated instructions.

(e) In the case of Generating Units that do not form part of a BM Unit any change in Active Power as a result of, or required to enable, the provision of an Ancillary Service will be dealt with as part of that Ancillary Service Agreement and/or provisions under the CUSC.

(f) A System to Generator Operational Intertripping Scheme will be armed in accordance with BC2.10.2(a)

BC2.8.2 Consistency with Export and Import Limits, QPNs and Dynamic Parameters

Ancillary Service instructions will be consistent with the Export and Import Limits, QPNs, and Joint BM Unit Data provided or modified under BC1 or BC2 and the Dynamic Parameters provided or modified under BC2. Ancillary Service instructions may also recognise Other Relevant Data provided or modified under BC1 or BC2.

BC2.8.3 Rejection of Ancillary Service instructions

(a) Ancillary Service instructions may only be rejected, by automatic logging device or by telephone, on safety grounds (relating to personnel or plant) or because they are not consistent with the applicable Export and Import Limits, QPNs, Dynamic Parameters, Joint BM Unit Data, Other Relevant Data or data contained in the Ancillary Services Agreement and a reason must be given immediately for non-acceptance.

(b) The issue of Ancillary Service instructions for Reactive Power will be made with due regard to any resulting change in Active Power output. The instruction may be rejected if it conflicts with any Bid-Offer Acceptance issued in accordance with BC2.7 or with the Physical Notification.

(c) Where Ancillary Service instructions relating to Active Power and Reactive Power are given together, and to achieve the Reactive Power output would cause the BM Unit to operate outside Dynamic Parameters as a result of the Active Power instruction being met at the same time, then the timescale of implementation of the Reactive Power instruction may be extended to be no longer than the timescale for implementing the Active Power instruction but in any case to achieve the Mvar Ancillary Service instruction as soon as possible.
BC2.8.4 Action Required from BM Units

(a) Each BM Unit (or Generating Unit) will comply in accordance with BC2.8.1 with all Ancillary Service instructions relating to Reactive Power properly given by NGET within 2 minutes or such longer period as NGET may instruct, and all other Ancillary Service instructions without delay, unless the BM Unit or Generating Unit has given notice to NGET under the provisions of BC2.8.3 regarding non-acceptance of Ancillary Service instructions.

(b) Each BM Unit may deviate from the profile of its Final Physical Notification Data, as modified by any Bid-Offer Acceptances issued in accordance with BC2.7.1, only as a result of responding to Frequency deviations when operating in Frequency Sensitive Mode in accordance with the Ancillary Services Agreement.

(c) Each Generating Unit that does not form part of a BM Unit may deviate from the profile of its Final Physical Notification Data where agreed by NGET and the User, including but not limited to, as a result of providing an Ancillary Service in accordance with the Ancillary Service Agreement.

(d) In the event that while carrying out the Ancillary Service instructions an unforeseen problem arises caused by safety reasons (relating to personnel or plant), NGET must be notified immediately by telephone and this may lead to revision of BM Unit Data or Generating Unit Data in accordance with BC2.5.3.

BC2.8.5 Reactive Despatch Network Restrictions

Where NGET has received notification pursuant to the Grid Code that a Reactive Despatch Network Restriction is in place with respect to any Embedded Generating Unit, Embedded Power Park Module or DC Converter at an Embedded DC Converter Station, then NGET will not issue any Reactive Despatch Instruction with respect to that Generating Unit, Power Park Module or DC Converter until such time as notification is given to NGET pursuant to the Grid Code that such Reactive Despatch Network Restriction is no longer affecting that Generating Unit, Power Park Module or DC Converter.

BC2.9 EMERGENCY CIRCUMSTANCES

BC2.9.1 Emergency Actions

BC2.9.1.1 In certain circumstances (as determined by NGET in its reasonable opinion) it will be necessary, in order to preserve the integrity of the National Electricity Transmission System and any synchronously connected External System, for NGET to issue Emergency Instructions. In such circumstances, it may be necessary to depart from normal Balancing Mechanism operation in accordance with BC2.7 in issuing Bid-Offer Acceptances. BM Participants must also comply with the requirements of BC3.

BC2.9.1.2 Examples of circumstances that may require the issue of Emergency Instructions include:-

(a) Events on the National Electricity Transmission System or the System of another User; or

(b) the need to maintain adequate System and Localised NRAPM in accordance with BC2.9.4 below; or
(c) the need to maintain adequate frequency sensitive **Gensets** in accordance with BC2.9.5 below; or

(d) the need to implement Demand Control in accordance with OC6; or

(e) (i) the need to invoke the Black Start process or the Re-Synchronisation of De-Synchronised Island process in accordance with OC9; or

(ii) the need to request provision of a **Maximum Generation Service**; or

(iii) the need to issue an **Emergency Deenergisation Instruction** in circumstances where the condition or manner of operation of any **Transmission Plant** and/or **Apparatus** is such that it may cause damage or injury to any person or to the **National Electricity Transmission System**.

BC2.9.1.3 In the case of **BM Units** and **Generating Units** in Great Britain, **Emergency Instructions** will be issued by **NGET** direct to the **User** at the **Control Point** for the **BM Unit** or **Generating Unit** and may require an action or response which is outside its **Other Relevant Data**, **QPNs**, or **Export and Import Limits** submitted under BC1, or revised under BC1 or BC2, or **Dynamic Parameters** submitted or revised under BC2.

BC2.9.1.4 In the case of a **Network Operator** or an **Externally Interconnected System Operator**, **Emergency Instructions** will be issued to its **Control Centre**.

**BC2.9.2 Implementation of Emergency Instructions**

BC2.9.2.1 **Users** will respond to **Emergency Instructions** issued by **NGET** without delay and using all reasonable endeavours to so respond. **Emergency Instructions** may only be rejected by an **User** on safety grounds (relating to personnel or plant) and this must be notified to **NGET** immediately by telephone.

BC2.9.2.2 **Emergency Instructions** will always be prefixed with the words “This is an **Emergency Instruction**” except in the case of:

(i) **Maximum Generation Service** instructed by electronic data communication facilities where the instruction will be issued in accordance with the provisions of the **Maximum Generation Service Agreement**; and

(ii) An **Emergency Deenergisation Instruction**, where the **Emergency Deenergisation Instruction** will be pre-fixed with the words ‘This is an **Emergency Deenergisation Instruction**’; and

(iii) during a **Black Start** any instruction given by **NGET** will (unless **NGET** specifies otherwise) be deemed to be an **Emergency Instruction** need not be pre-fixed with the words ‘This is an Emergency Instruction’.

BC2.9.2.3 In all cases under this BC2.9 except BC2.9.1.2 (e) where **NGET** issues an **Emergency Instruction** to a **BM Participant** which is not rejected under BC2.9.2.1, the **Emergency Instruction** shall be treated as a **Bid-Offer Acceptance**. For the avoidance of doubt, any **Emergency Instruction** issued to a **Network Operator** or to an **Externally Interconnected System Operator** or in respect of a **Generating Unit** that does not form part of a **BM Unit**, will not be treated as a **Bid-Offer Acceptance**.
BC2.9.2.4  In the case of BC2.9.1.2 (e) (ii) where NGET issues an Emergency Instruction pursuant to a Maximum Generation Service Agreement payment will be dealt with in accordance with the CUSC and the Maximum Generation Service Agreement.

BC2.9.2.5  In the case of BC2.9.1.2 (e) (iii) where NGET issues an Emergency Deenergisation Instruction payment will be dealt with in accordance with the CUSC, Section 5.

BC2.9.2.6  In the of BC2.9.1.2 (e) (i) upon receipt of an Emergency Instruction by a Generator during a Black Start the provisions of Section G of the BSC relating to compensation shall apply.
BC2.9.3 Examples of Emergency Instructions

BC2.9.3.1 In the case of a BM Unit or a Generating Unit, Emergency Instructions may include an instruction for the BM Unit or the Generating Unit to operate in a way that is not consistent with the Dynamic Parameters, QPNs and/or Export and Import Limits.

BC2.9.3.2 In the case of a Generator, Emergency Instructions may include:

(a) an instruction to trip one or more Gensets (excluding Operational Intertripping); or

(b) an instruction to trip Mills or to Part Load a Generating Unit (as defined in the Glossary and Definitions and not limited by BC2.2); or

(c) an instruction to Part Load a CCGT Module or Power Park Module; or

(d) an instruction for the operation of CCGT Units within a CCGT Module (on the basis of the information contained within the CCGT Module Matrix) when emergency circumstances prevail (as determined by NGET in NGET’s reasonable opinion); or

(e) an instruction to generate outside normal parameters, as allowed for in 4.2 of the CUSC; or

(f) an instruction for the operation of Generating Units within a Cascade Hydro Scheme (on the basis of the additional information supplied in relation to individual Generating Units) when emergency circumstances prevail (as determined by NGET in NGET’s reasonable opinion); or

(g) an instruction for the operation of a Power Park Module (on the basis of the information contained within the Power Park Module Availability Matrix) when emergency circumstances prevail (as determined by NGET in NGET’s reasonable opinion).

BC2.9.3.3 Instructions to Network Operators relating to the Operational Day may include:

(a) a requirement for Demand reduction and disconnection or restoration pursuant to OC6;

(b) an instruction to effect a load transfer between Grid Supply Points;

(c) an instruction to switch in a System to Demand Intertrip Scheme;

(d) an instruction to split a network;

(e) an instruction to disconnect an item of Plant or Apparatus from the System.

BC2.9.4 Maintaining adequate System and Localised NRAPM (Negative Reserve Active Power Margin)

BC2.9.4.1 Where NGET is unable to satisfy the required System NRAPM or Localised NRAPM by following the process described in BC1.5.5, NGET will issue an
Emergency Instruction to exporting BM Units for De-Synchronising on the basis of Bid-Offer Data submitted to NGET in accordance with BC1.4.2(d).

BC2.9.4.2 In the event that NGET is unable to differentiate between exporting BM Units according to Bid-Offer Data, NGET will instruct a BM Participant to Shutdown a specified exporting BM Unit for such period based upon the following factors:

(a) effect on power flows (resulting in the minimisation of transmission losses);

(b) reserve capability;

(c) Reactive Power worth;

(d) Dynamic Parameters;

(e) in the case of Localised NRAPM, effectiveness of output reduction in the management of the System Constraint.

BC2.9.4.3 Where NGET is still unable to differentiate between exporting BM Units, having considered all the foregoing, NGET will decide which exporting BM Unit to Shutdown by the application of a quota for each BM Participant in the ratio of each BM Participant's Physical Notifications.

BC2.9.4.4 Other than as provided in BC2.9.4.5 and BC2.9.4.6 below, in determining which exporting BM Units to De-Synchronise under this BC2.9.4, NGET shall not consider in such determination (and accordingly shall not instruct to De-Synchronise) any Generating Unit (as defined in the Glossary and Definitions and not limited by BC2.2) within an Existing Gas Cooled Reactor Plant.

BC2.9.4.5 NGET shall be permitted to instruct a Generating Unit (as defined in the Glossary and Definitions and not limited by BC2.2) within an Existing AGR Plant to De-Synchronise if the relevant Generating Unit within the Existing AGR Plant has failed to offer to be flexible for the relevant instance at the request of NGET within the Existing AGR Plant Flexibility Limit.

BC2.9.4.6 Notwithstanding the provisions of BC2.9.4.5 above, if the level of System NRAPM (taken together with System constraints) or Localised NRAPM is such that it is not possible to avoid instructing a Generating Unit (as defined in the Glossary and Definitions and not limited by BC2.2) within an Existing Magnox Reactor Plant and/or an Existing AGR Plant whether or not it has met requests within the Existing AGR Flexibility Limit to De-Synchronise NGET may, provided the power flow across each External Interconnection is either at zero or results in an export of power from the Total System, so instruct a Generating Unit (as defined in the Glossary and Definitions and not limited by BC2.2) within an Existing Magnox Reactor Plant and/or an Existing AGR Plant to De-Synchronise in the case of System NRAPM, in all cases and in the case of Localised NRAPM, when the power flow would have a relevant effect.

BC2.9.4.7 When instructing exporting BM Units which form part of an On-Site Generator Site to reduce generation under this BC2.9.4, NGET will not issue an instruction which would reduce generation below the reasonably anticipated Demand of the On-Site Generator Site. For the avoidance of doubt, it should be noted that the term "On-Site Generator Site" only relates to Trading Units which have fulfilled the Class 1 or Class 2 requirements.
BC2.9.5 Maintaining adequate Frequency Sensitive Generation

BC2.9.5.1 If, post Gate Closure, NGET determines, in its reasonable opinion, from the information then available to it (including information relating to Generating Unit (as defined in the Glossary and Definitions and not limited by BC2.2) breakdown) that the number of and level of Primary, Secondary and High Frequency Response available from Gensets (other than those units within Existing Gas Cooled Reactor Plant, which are permitted to operate in Limited Frequency Sensitive Mode at all times under BC3.5.3) available to operate in Frequency Sensitive Mode is such that it is not possible to avoid De-Synchronising Existing Gas Cooled Reactor Plant then provided that:

(a) there are (or, as the case may be, that NGET anticipates, in its reasonable opinion, that at the time that the instruction is to take effect there will be) no other Gensets generating and exporting on to the Total System which are not operating in Frequency Sensitive Mode (or which are operating with only a nominal amount in terms of level and duration) (unless, in NGET's reasonable opinion, necessary to assist the relief of System constraints or necessary as a result of other System conditions); and

(b) the power flow across each External Interconnection is (or, as the case may be, is anticipated to be at the time that the instruction is to take effect) either at zero or result in an export of power from the Total System, then NGET may instruct such of the Existing Gas Cooled Reactor Plant to De-Synchronise as it is, in NGET's reasonable opinion, necessary to De-Synchronise and for the period for which the De-Synchronising is, in NGET's reasonable opinion, necessary.

BC2.9.5.2 If in NGET's reasonable opinion it is necessary for both the procedure in BC2.9.4 and that set out in BC2.9.5.1 to be followed in any given situation, the procedure in BC2.9.4 will be followed first, and then the procedure set out in BC2.9.5.1. For the avoidance of doubt, nothing in this sub-paragraph shall prevent either procedure from being followed separately and independently of the other.

BC2.9.6 Emergency Assistance to and from External Systems

(a) An Externally Interconnected System Operator (in its role as operator of the External System) may request that NGET takes any available action to increase the Active Energy transferred into its External System, or reduce the Active Energy transferred into the National Electricity Transmission System by way of emergency assistance if the alternative is to instruct a demand reduction on all or part of its External System (or on the system of an Interconnector User using its External System). Such request must be met by NGET providing this does not require a reduction of Demand on the National Electricity Transmission System, or lead to a reduction in security on the National Electricity Transmission System.

(b) NGET may request that an Externally Interconnected System Operator takes any available action to increase the Active Energy transferred into the National Electricity Transmission System, or reduce the Active Energy transferred into its External System by way of emergency assistance if the alternative is to instruct a Demand reduction on all or part of the National Electricity Transmission System. Such request must be met by the Externally Interconnected System Operator providing this does not require a reduction of Demand on its External System (or on the system of
Interconnector Users using its External System), or lead to a reduction in security on such External System or system.

BC2.9.7 Unplanned outages of electronic communication and computing facilities

BC2.9.7.1 In the event of an unplanned outage of the electronic data communication facilities or of NGET’s associated computing facilities or in the event of a Planned Maintenance Outage lasting longer than the planned duration, in relation to a post-Gate Closure period NGET will, as soon as it is reasonably able to do so, issue a NGET Computing System Failure notification by telephone or such other means agreed between Users and NGET indicating the likely duration of the outage.

BC2.9.7.2 During the period of any such outage, the following provisions will apply:

(a) NGET will issue further NGET Computing System Failure notifications by telephone or such other means agreed between Users and NGET to all BM Participants to provide updates on the likely duration of the outage;

(b) BM Participants should operate in relation to any period of time in accordance with the Physical Notification prevailing at Gate Closure current at the time of the computer system failure in relation to each such period of time. Such operation shall be subject to the provisions of BC2.5.1, which will apply as if set out in this BC2.9.7.2. No further submissions of BM Unit Data or Generating Unit Data (other than data specified in BC1.4.2(c) (Export and Import Limits) and BC1.4.2(e) (Dynamic Parameters) should be attempted. Plant failure or similar problems causing significant deviation from Physical Notification should be notified to NGET by telephone by the submission of a revision to Export and Import Limits in relation to the BM Unit or Generating Unit Data so affected;

(c) Revisions to Export and Import Limits and to Dynamic Parameters should be notified to NGET by telephone and will be recorded for subsequent use;

(d) NGET will issue Bid-Offer Acceptances by telephone which will be recorded for subsequent use;

(e) No data will be transferred from NGET to the BMRA until the communication facilities are re-established.

BC2.9.7.3 NGET will advise BM Participants of the withdrawal of the NGET Computing System Failure notification following the re-establishment of the communication facilities.

BC2.10 OTHER OPERATIONAL INSTRUCTIONS AND NOTIFICATIONS

BC2.10.1 NGET may, from time to time, need to issue other instructions or notifications associated with the operation of the National Electricity Transmission System.

BC2.10.2 Such instructions or notifications may include:

Intertrips

(a) an instruction to arm or disarm an Operational Intertripping scheme;
Tap Positions
(b) a request for a Genset step-up transformer tap position (for security assessment);

Tests
(c) an instruction to carry out tests as required under OC5, which may include the issue of an instruction regarding the operation of CCGT Units within a CCGT Module at a Large Power Station;

Future BM Unit Requirements
(d) a reference to any implications for future BM Unit requirements and the security of the National Electricity Transmission System, including arrangements for change in output to meet post fault security requirements;

(e) Changes to Target Frequency
a notification of a change in Target Frequency, which will normally only be 49.95, 50.00, or 50.05Hz but in exceptional circumstances as determined by NGET in its reasonable opinion, may be 49.90 or 50.10Hz.

BC2.10.3 Where an instruction or notification under BC2.10.2 (c) or (d) results in a change to the input or output level of the BM Unit then NGET shall issue a Bid-Offer Acceptance or Emergency Instruction as appropriate.

BC2.11 LIAISON WITH GENERATORS FOR RISK OF TRIP AND AVR TESTING

BC2.11.1 A Generator at the Control Point for any of its Large Power Stations may request NGET's agreement for one of the Gensets at that Power Station to be operated under a risk of trip. NGET's agreement will be dependent on the risk to the National Electricity Transmission System that a trip of the Genset would constitute.

BC2.11.2 (a) Each Generator at the Control Point for any of its Large Power Stations will operate its Synchronised Gensets (excluding Power Park Modules) with:

(i) AVR constant Terminal Voltage or VAR Limiters in service at all times. AVR constant Reactive Power or Power Factor mode should, if installed, be disabled; and

(ii) its generator step-up transformer tap changer selected to manual mode,

unless released from this obligation in respect of a particular Genset by NGET.

(b) Each Generator at the Control Point for any of its Large Power Stations will operate its Power Park Modules with a Completion Date before 1st January 2006 at unity power factor at the Grid Entry Point (or User System Entry Point if Embedded).

(c) Each Generator at the Control Point for any of its Large Power Stations will operate its Power Park Modules with a Completion Date on or after 1st January 2006 in voltage control mode at the Grid Entry Point (or User System Entry Point if Embedded). Constant Reactive Power or Power Factor mode should, if installed, be disabled.
(d) Where a **Power System Stabiliser** is fitted as part of the excitation system or voltage control system of a **Genset**, it requires on-load commissioning which must be witnessed by **NGET**. Only when the performance of the **Power System Stabiliser** has been approved by **NGET** shall it be switched into service by a **Generator** and then it will be kept in service at all times unless otherwise agreed with **NGET**. Further reference is made to this in CC.6.3.8.

**BC2.11.3**

A **Generator** at the **Control Point** for any of its **Power Stations** may request **NGET**'s agreement for one of its **Gensets** at that **Power Station** to be operated with the **AVR** in manual mode, or **Power System Stabiliser** switched out, or **VAR limiter** switched out. **NGET**'s agreement will be dependent on the risk that would be imposed on the **National Electricity Transmission System** and any **User System**. Provided that in any event a **Generator** may take such action as is reasonably necessary on safety grounds (relating to personnel or plant).

**BC2.12**

**LIAISON WITH EXTERNALLY INTERCONNECTED SYSTEM OPERATORS**

**BC2.12.1**

Co-ordination role of **Externally Interconnected System Operators**

(a) The **Externally Interconnected System Operator** will act as the **Control Point** for **Bid-Offer Acceptances** on behalf of **Interconnector Users** and will co-ordinate instructions relating to **Ancillary Services** and **Emergency Instructions** on behalf of **Interconnector Users** using its **External System** in respect of each **Interconnector User**'s **BM Units**.

(b) **NGET** will issue **Bid-Offer Acceptances** and instructions for **Ancillary Services** relating to **Interconnector Users’ BM Units** to each **Externally Interconnected System Operator** in respect of each **Interconnector User** using its **External System**.

(c) If, as a result of a reduction in the capability (in MW) of the **External Interconnection**, the total of the **Physical Notifications** and **Bid-Offer Acceptances** issued for the relevant period using that **External Interconnection**, as stated in the **BM Unit Data** exceeds the reduced capability (in MW) of the respective **External Interconnection** in that period then **NGET** shall notify the **Externally Interconnected System Operator** accordingly. The **Externally Interconnected System Operator** should seek a revision of **Export and Import Limits** from one or more of its **Interconnector Users** for the remainder of the **Balancing Mechanism** period during which **Physical Notifications** cannot be revised.
Appendix 1 – Form of Bid-Offer Acceptances

BC2.A.1.1 This Appendix describes the forms of Bid-Offer Acceptances. As described in BC2.6.1 Bid-Offer Acceptances are normally given by an automatic logging device, but in the event of failure of the logging device, Bid-Offer Acceptances will be given by telephone.

BC2.A.1.2 For each BM Unit the Bid-Offer Acceptance will consist of a series of MW figures and associated times.

BC2.A.1.3 The Bid-Offer Acceptances relating to CCGT Modules will assume that the CCGT Units within the CCGT Module will operate in accordance with the CCGT Module Matrix, as required by BC1. The Bid-Offer Acceptances relating to Cascade Hydro Schemes will assume that the Generating Unit forming part of the Cascade Hydro Scheme will operate, where submitted, in accordance with the Cascade Hydro Scheme Matrix submitted under BC1.

BC2.A.1.4 BID-OFFER ACCEPTANCES GIVEN BY AUTOMATIC LOGGING DEVICE.

(a) The complete form of the Bid-Offer Acceptance is given in the EDL Message Interface Specification which can be made available to Users on request.

(b) Bid-Offer Acceptances will normally follow the form:

(i) BM Unit Name
(ii) Instruction Reference Number
(iii) Time of instruction
(iv) Type of instruction
(v) BM Unit Bid-Offer Acceptance number
(vi) Number of MW/Time points making up instruction (minimum 2, maximum 5)
(vii) MW value and Time value for each point identified in (vi)

The times required in the instruction are input and displayed in London time, but communicated electronically in GMT.

BC2.A.1.5 BID-OFFER ACCEPTANCES GIVEN BY TELEPHONE

(a) All run-up/run-down rates will be assumed to be constant and consistent with Dynamic Parameters. Each Bid-Offer Acceptance will, wherever possible, be kept simple, drawing as necessary from the following forms and BC2.7

(b) Bid-Offer Acceptances given by telephone will normally follow the form:

(i) an exchange of operator names;
(ii) BM Unit Name;
(iii) Time of instruction;
(iv) Type of instruction;
(v) Number of MW/Time points making up instruction (minimum 2, maximum 5)
(vi) MW value and Time value for each point identified in (v)

The times required in the instruction are expressed in London time.
For example, for a BM Unit ABCD-1 acceptance logged with a start time at 1400 hours and with a FPN at 300MW:

“BM Unit ABCD-1 Bid-Offer Acceptance timed at 1400 hours. Acceptance consists of 4 MW/Time points as follows:

300MW at 1400 hours
400MW at 1415 hours
400MW at 1450 hours
300MW at 1500 hours”

BC2.A.1.6 SUBMISSION OF BID-OFFER ACCEPTANCE DATA TO THE BMRA

The relevant information contained in Bid-Offer Acceptances issued by NGET will be converted into “from” and “to” MW levels and times before they are submitted to the BMRA by NGET.
Appendix 2 - Type and Form of Ancillary Service Instructions

BC2.A.2.1 This part of the Appendix consists of a non-exhaustive list of the forms and types of instruction for a Genset to provide System Ancillary Services. There may be other types of Commercial Ancillary Services and these will be covered in the relevant Ancillary Services Agreement. In respect of the provision of Ancillary Services by Generating Units the forms and types of instruction will be in the form of this Appendix 2 unless amended in the Ancillary Services Agreement.

As described in CC.8, System Ancillary Services consist of Part 1 and Part 2 System Ancillary Services.

Part 1 System Ancillary Services comprise:

(a) **Reactive Power** supplied other than by means of synchronous or static compensators. This is required to ensure that a satisfactory System voltage profile is maintained and that sufficient Reactive Power reserves are maintained under normal and fault conditions. Ancillary Service instructions in relation to Reactive Power may include:

(i) Mvar Output
(ii) Target Voltage Levels
(iii) Tap Changes
(iv) Maximum Mvar Output (‘maximum excitation’)
(v) Maximum Mvar Absorption (‘minimum excitation’)

(b) **Frequency** Control by means of Frequency sensitive generation. Gensets may be required to move to or from Frequency Sensitive Mode in the combinations agreed in the relevant Ancillary Services Agreement. They will be specifically requested to operate so as to provide Primary Response and/or Secondary Response and/or High Frequency Response.

Part 2 System Ancillary Services comprise:

(c) **Frequency** Control by means of Fast Start.

(d) **Black Start Capability**

(e) **System to Generator Operational Intertripping**

BC2.A.2.2 As Ancillary Service instructions are not part of Bid-Offer Acceptances they do not need to be closed instructions and can cover any period of time, not just limited to the period of the Balancing Mechanism.

BC2.A.2.3 As described in BC2.6.1 Ancillary Service instructions are normally given by automatic logging device, but in the absence of, or in the event of failure of the logging device, instructions will be given by telephone.

BC2.A.2.4 **INSTRUCTIONS GIVEN BY AUTOMATIC LOGGING DEVICE.**

(a) The complete form of the Ancillary Service instruction is given in the EDL Message Interface Specification which is available to Users on request from NGET.
Ancillary Service instructions for Frequency Control will normally follow the form:

(i) BM Unit Name
(ii) Instruction Reference Number
(iii) Time of instruction
(iv) Type of instruction (REAS)
(v) Reason Code
(vi) Start Time

Ancillary Service instructions for Reactive Power will normally follow the form:

(i) BM Unit Name
(ii) Instruction Reference Number
(iii) Time of instruction
(iv) Type of instruction (MVAR, VOLT or TAPP)
(v) Target Value
(vi) Target Time

The times required in the instruction are input and displayed in London time, but communicated electronically in GMT.

INSTRUCTIONS GIVEN BY TELEPHONE

Ancillary Service instructions for Frequency Control will normally follow the form:

(i) an exchange of operator names;
(ii) BM Unit Name;
(iii) Time of instruction;
(iv) Type of instruction;
(v) Start Time.

The times required in the instruction are expressed in London time.

For example, for BM Unit ABCD-1 instructed at 1400 hours to provide Primary and High Frequency response starting at 1415 hours:

“BM Unit ABCD-1 message timed at 1400 hours. Unit to Primary and High Frequency Response at 1415 hours”

Ancillary Service instructions for Reactive Power will normally follow the form:

(i) an exchange of operator names;
(ii) BM Unit Name;
(iii) Time of instruction;
(iv) Type of instruction (MVAR, VOLT, SETPOINT, SLOPE or TAPP)
(v) Target Value
(vi) Target Time.

The times required in the instruction are expressed as London time.

For example, for BM Unit ABCD-1 instructed at 1400 hours to provide 100Mvar by 1415 hours:
“BM Unit ABCD-1 message timed at 1400 hours. MVAR instruction. Unit to plus 100 Mvar target time 1415 hours.”

**BC2.A.2.6 Reactive Power**

As described in BC2.A.2.4 and BC2.A.2.5 instructions for **Ancillary Services** relating to **Reactive Power** may consist of any of several specific types of instruction. The following table describes these instructions in more detail:

<table>
<thead>
<tr>
<th>Instruction Name</th>
<th>Description</th>
<th>Type of Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mvar Output</strong></td>
<td>The individual Mvar output from the <strong>Genset</strong> onto the <strong>National Electricity Transmission System</strong> at the <strong>Grid Entry Point</strong> (or onto the <strong>User System</strong> at the <strong>User System Entry Point</strong> in the case of <strong>Embedded Power Stations</strong>), namely on the higher voltage side of the generator step-up transformer. In relation to each <strong>Genset</strong>, where there is no HV indication, <strong>NGET</strong> and the <strong>Generator</strong> will discuss and agree equivalent Mvar levels for the corresponding LV indication. Where a <strong>Genset</strong> is instructed to a specific Mvar output, the <strong>Generator</strong> must achieve that output within a tolerance of +/- 25 Mvar (for <strong>Gensets</strong> in England and Wales) or the lesser of +/- 5% of rated output or 25Mvar (for <strong>Gensets</strong> in Scotland) (or such other figure as may be agreed with <strong>NGET</strong>) by tap changing on the generator step-up transformer, unless agreed otherwise. Once this has been achieved, the <strong>Generator</strong> will not tap again without prior consultation with and the agreement of <strong>NGET</strong>, on the basis that Mvar output will be allowed to vary with <strong>System</strong> conditions.</td>
<td>MVAR</td>
</tr>
<tr>
<td><strong>Target Voltage Levels</strong></td>
<td>Target voltage levels to be achieved by the <strong>Genset</strong> on the <strong>National Electricity Transmission System</strong> at the <strong>Grid Entry Point</strong> (or on the <strong>User System</strong> at the <strong>User System Entry Point</strong> in the case of <strong>Embedded Power Stations</strong>), namely on the higher voltage side of the generator step-up transformer. Where a <strong>Genset</strong> is instructed to a specific target voltage, the <strong>Generator</strong> must achieve that target within a tolerance of ±1 kV (or such other figure as may be agreed with <strong>NGET</strong>) by tap changing on the generator step-up transformer, unless agreed otherwise with <strong>NGET</strong>. In relation to each <strong>Genset</strong>, where there is no HV indication, <strong>NGET</strong> and the <strong>Generator</strong> will discuss and agree equivalent voltage levels for the corresponding LV indication. Under normal operating conditions, once this target voltage level has been achieved the <strong>Generator</strong> will not tap again without prior consultation with, and with the agreement of, <strong>NGET</strong>. However, under certain circumstances the <strong>Generator</strong> may be instructed to maintain a target voltage until otherwise instructed and this will be achieved by tap changing on the generator step-up transformer without reference to <strong>NGET</strong>.</td>
<td>VOLT</td>
</tr>
<tr>
<td>Instruction Name</td>
<td>Description</td>
<td>Type of Instruction</td>
</tr>
<tr>
<td>------------------</td>
<td>-------------</td>
<td>---------------------</td>
</tr>
<tr>
<td><strong>Setpoint Voltage</strong></td>
<td>Where a Non-Synchronous Generating Unit, DC Converter or Power Park Module is instructed to a specific Setpoint Voltage, the Generator must achieve that Setpoint Voltage within a tolerance of ±0.25% (or such other figure as may be agreed with NGET). The Generator must maintain the specified Setpoint Voltage target until an alternative target is received from NGET.</td>
<td>SETPOINT</td>
</tr>
<tr>
<td><strong>Slope</strong></td>
<td>Where a Non-Synchronous Generating Unit, DC Converter or Power Park Module is instructed to a specific Slope, the Generator must achieve that Slope within a tolerance of ±0.5% (or such other figure as may be agreed with NGET). The Generator must maintain the specified Slope target until an alternative target is received from NGET. The Generator will not be required to implement a new Slope setting in a time of less than 1 week from the time of the instruction.</td>
<td>SLOPE</td>
</tr>
<tr>
<td><strong>Tap Changes</strong></td>
<td>Details of the required generator step-up transformer tap changes in relation to a Genset. The instruction for tap changes may be a Simultaneous Tap Change instruction, whereby the tap change must be effected by the Generator in response to an instruction from NGET issued simultaneously to relevant Power Stations. The instruction, which is normally preceded by advance notice, must be effected as soon as possible, and in any event within one minute of receipt from NGET of the instruction. For a Simultaneous Tap Change, change Genset generator step-up transformer tap position by one [two] taps to raise or lower (as relevant) System voltage, to be executed at time of instruction.</td>
<td>TAPP</td>
</tr>
<tr>
<td><strong>Maximum Mvar Output</strong> (&quot;maximum excitation&quot;)</td>
<td>Under certain conditions, such as low System voltage, an instruction to maximum Mvar output at instructed MW output (&quot;maximum excitation&quot;) may be given, and a Generator should take appropriate actions to maximise Mvar output unless constrained by plant operational limits or safety grounds (relating to personnel or plant).</td>
<td></td>
</tr>
<tr>
<td><strong>Maximum Mvar Absorption</strong> (&quot;minimum excitation&quot;)</td>
<td>Under certain conditions, such as high System voltage, an instruction to maximum Mvar absorption at instructed MW output (&quot;minimum excitation&quot;) may be given, and a Generator should take appropriate actions to maximise Mvar absorption unless constrained by plant operational limits or safety grounds (relating to personnel or plant).</td>
<td></td>
</tr>
</tbody>
</table>

BC2.A.2.7 In addition, the following provisions will apply to Reactive Power instructions:

(a) In circumstances where NGET issues new instructions in relation to more than one BM Unit at the same Power Station at the same time tapping will be carried out by the Generator one tap at a time either alternately between (or in sequential order, if more than two), or at the same time on, each BM Unit.
(b) Where the instructions require more than two taps per BM Unit and that means that the instructions cannot be achieved within 2 minutes of the instruction time (or such longer period at NGET may have instructed), the instructions must each be achieved with the minimum of delay after the expiry of that period.

(c) It should be noted that should System conditions require, NGET may need to instruct maximum Mvar output to be achieved as soon as possible, but (subject to the provisions of paragraph (BC2.A.2.7(b) above) in any event no later than 2 minutes after the instruction is issued.

(d) An Ancillary Service instruction relating to Reactive Power may be given in respect of CCGT Units within a CCGT Module at a Power Station where running arrangements and/or System conditions require, in both cases where exceptional circumstances apply and connection arrangements permit.

(e) In relation to Mvar matters, Mvar generation/output is an export onto the System and is referred to as "lagging Mvar", and Mvar absorption is an import from the System and is referred to as "leading Mvar".

(f) It should be noted that the excitation control system constant Reactive Power output control mode or constant power factor output control mode will always be disabled, unless agreed otherwise with NGET.
Appendix 3 – Submission of Revised Mvar Capability

BC2.A.3.1 For the purpose of submitting revised Mvar data the following terms shall apply:

Full Output  In the case of a **Synchronous Generating Unit** (as defined in the Glossary and Definitions and not limited by BC2.2) is the MW output measured at the generator stator terminals representing the LV equivalent of the **Registered Capacity** at the Grid Entry Point, and in the case of a **Non-Synchronous Generating Unit** (excluding **Power Park Units**), **DC Converter** or **Power Park Module** is the **Registered Capacity** at the Grid Entry Point.

Minimum Output  In the case of a **Synchronous Generating Unit** (as defined in the Glossary and Definitions and not limited by BC2.2) is the MW output measured at the generator stator terminals representing the LV equivalent of the **Minimum Generation** at the Grid Entry Point, and in the case of a **Non-Synchronous Generating Unit** (excluding **Power Park Units**), **DC Converter** or **Power Park Module** is the **Minimum Generation** at the Grid Entry Point.

BC2.A.3.2 The following provisions apply to faxed submission of revised Mvar data:

(a) The fax must be transmitted to **NGET** (to the relevant location in accordance with GC6) and must contain all the sections from the relevant part of Annexure 1 and from either Annexure 2 or 3 (as applicable) but with only the data changes set out. The "notification time" must be completed to refer to the time of transmission, where the time is expressed as London time.

(b) Upon receipt of the fax, **NGET** will acknowledge receipt by sending a fax back to the **User**. The acknowledgement will either state that the fax has been received and is legible or will state that it (or part of it) is not legible and will request re-transmission of the whole (or part) of the fax.

(c) Upon receipt of the acknowledging fax the **User** will, if requested, re-transmit the whole or the relevant part of the fax.

(d) The provisions of paragraphs (b) and (c) then apply to that re-transmitted fax.
Company name REVISED Mvar DATA

TO: NGET Transmission Control Centre Fax telephone No.

Number of pages inc. header:............................

Sent By: ........................................................................................................

Return Acknowledgement Fax to ....................................................................

For Retransmission or Clarification ring..........................................................

Acknowledged by NGET: (Signature)

Acknowledgement time and date .................................................................

Legibility of FAX : Acceptable

Unacceptable (List pages if appropriate) ( Resend FAX )
APPENDIX 3 - ANNEXURE 2

To: NGET Transmission Control Centre

From: [Company Name & Location]

REVISED Mvar DATA – GENERATING UNITS EXCLUDING POWER PART UNITS AND DC CONVERTERS

NOTIFICATION TIME: HRS MINS DD MM YY / / 

<table>
<thead>
<tr>
<th>GENERATING UNIT* /POWER PARK MODULE DC CONVERTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start Time/Date (if not effective immediately)</td>
</tr>
</tbody>
</table>

REACTIVE POWER CAPABILITY AT SYNCHRONOUS GENERATING UNIT STATOR TERMINAL
(at rated terminal volts)

<table>
<thead>
<tr>
<th>MW</th>
<th>LEAD (Mvar)</th>
<th>LAG (Mvar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT RATED MW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT FULL OUTPUT (MW)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT MINIMUM OUTPUT (MW)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GENERATING UNIT STEP-UP TRANSFORMER DATA, WHERE APPLICABLE

<table>
<thead>
<tr>
<th>TAP CHANGE RANGE (+%,-%)</th>
<th>TAP NUMBER RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OPTIONAL INFORMATION (for Ancillary Services use only) -
REACTIVE POWER CAPABILITY AT COMMERCIAL BOUNDARY (at rated stator terminal and nominal system volts)

<table>
<thead>
<tr>
<th>LEAD (Mvar)</th>
<th>LAG (Mvar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT RATED MW</td>
<td></td>
</tr>
</tbody>
</table>

Predicted End Time/Date (to be confirmed by redeclaration)

Redeclaration made by (Signature) ________________________________

Generating Unit has the meaning given in the Glossary and Definitions and is not limited by BC2.2.

* For a CCGT, the redeclaration is for an individual CCGT unit and not the entire module.
APPENDIX 3 - ANNEXURE 3

To: NGET Transmission Control Centre

From: [Company Name & Location]

REVISED Mvar DATA – POWER PARK UNITS AND DC CONVERTERS

NOTIFICATION TIME:

<table>
<thead>
<tr>
<th>POWER PARK MODULE/ DC CONVERTER</th>
<th>HRS MINS DD MM YY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Start Time/Date (if not effective immediately)

REACTIVE POWER CAPABILITY AT:
- GRID ENTRY POINT (ENGLAND AND WALES); OR
- HV SIDE OF RELEVANT TRANSFORMER (SCOTLAND); OR
- USER SYSTEM ENTRY POINT (IF EMBEDDED) OF THE POWER PARK MODULE; OR
- DC CONVERTER OR THE AGGREGATED CAPABILITY OF THE POWER PARK UNITS AT THE POWER PARK UNIT TERMINALS

<table>
<thead>
<tr>
<th>MW</th>
<th>LEAD (Mvar)</th>
<th>LAG (Mvar)</th>
</tr>
</thead>
<tbody>
<tr>
<td>AT RATED MW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT 50% OF RATED MW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT 20% OF RATED MW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BELOW 20% OF RATED MW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AT 0% OF RATED MW</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Confirm voltage to which these figures relate

POWER PARK MODULE OR DC CONVERTER STEP-UP TRANSFORMER DATA, WHERE APPLICABLE

<table>
<thead>
<tr>
<th>TAP CHANGE RANGE (+%,-%)</th>
<th>TAP NUMBER RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Predicted End Time/Date (to be confirmed by redeclaration)

Redeclaration made by (Signature) ________________________________
Appendix 4 – Submission of availability of Frequency Sensitive Mode

BC2.A.4.1. For the purpose of submitting availability of Frequency Sensitive Mode, this process only relates to the provision of response under the Frequency Sensitive Mode and does not cover the provision of response under the Limited Frequency Sensitive Mode.

BC2.A.4.2. The following provisions apply to the faxed submission of the Frequency Sensitive Mode availability;

(a) The fax must be transmitted to NGET (to the relevant location in accordance with GC6) and must contain all the sections relevant to Appendix 4 – Annexure 1 but with only the data changes set out. The “notification time” must be completed to refer to the time and date of transmission, where the time is expressed in London time.

(b) Upon receipt of the fax, NGET will acknowledge receipt by sending a fax back to the User. This acknowledging fax should be in the format of Appendix 4 – Annexure 1. The acknowledgement will either state that the fax has been received and is legible or will state that it (or part of it) is not legible and will request re-transmission of the whole (or part) of the fax.

(c) Upon receipt of the acknowledging fax the User will, if requested re-transmit the whole or the relevant part of the fax.

(d) The provisions of paragraph (b) and (c) then apply to the re-transmitted fax.

BC2.A.4.3. The User shall ensure the availability of operating in the Frequency Sensitive Mode is restored as soon as reasonably practicable and will notify NGET using the format of Appendix 4 – Annexure 1. In the event of a sustained unavailability of Frequency Sensitive Mode NGET may seek to confirm compliance with the relevant requirements in the CCs through the process in OC5.
Appendix 4 – Annexure 1

To: NGET Transmission Control Centre
From: [Company Name and Location]

Submission of availability of Frequency Sensitive Mode

<table>
<thead>
<tr>
<th>Notification Time</th>
<th>HRS:MIN DD/MM/YY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**GENERATING UNIT** *

Start Time / Date (if not effective immediately)

The above unit is unavailable / available to operate in Frequency Sensitive Mode.

**Limited Frequency Sensitive Mode** must be maintained in accordance with BC3.7.2.

Please provided brief description of reason for unavailability of Frequency Sensitive Mode (e.g. Testing, technical problem)

If declaring Unavailability

Predicted End Time / Date (to be confirmed by re-declaration):

Re-declaration made by (signature) ________________________________

- For a CCGT the re-declaration is for an individual **CCGT Unit** and not the entire module

Receipt Acknowledgement from NGET

<table>
<thead>
<tr>
<th>Legible (tick box)</th>
<th>Illegible (tick box)</th>
</tr>
</thead>
</table>

Explanation:

Time:
Date:
Signature:

< End of BC2 >
## BALANCING CODE NO.3
### FREQUENCY CONTROL PROCESS

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(This contents page does not form part of the Grid Code)

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<td>5</td>
</tr>
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<td>5</td>
</tr>
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<td>5</td>
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<tr>
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<td>7</td>
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BALANCING CODE NO.3

FREQUENCY CONTROL PROCESS

BC3.1 INTRODUCTION

BC3 sets out the procedure for NGET to use in relation to Users to undertake System Frequency control. System Frequency will be controlled by response from Gensets (and DC Converters at DC Converter Stations) operating in Limited Frequency Sensitive Mode or Frequency Sensitive Mode, by the issuing of instructions to Gensets (and DC Converters at DC Converter Stations) and by control of Demand. The requirements for Frequency control are determined by the consequences and effectiveness of the Balancing Mechanism, and accordingly, BC3 is complementary to BC1 and BC2.

BC3.1.2 Inter-relationship with Ancillary Services

The provision of response (other than by operation in Limited Frequency Sensitive Mode or in accordance with BC3.7.1(c)) in order to contribute towards Frequency control, as described in BC3, by Generators or DC Converter Station owners will be an Ancillary Service. Ancillary Services are divided into three categories, System Ancillary Services Parts 1 and 2 and Commercial Ancillary Services. System Ancillary Services, Parts 1 and 2, are those Ancillary Services listed in CC.8.1; those in Part 1 of CC.8.1 are those for which the Connection Conditions require the capability as a condition of connection and those in Part 2 are those which may be agreed to be provided by Users and which can only be utilised by NGET if so agreed. Commercial Ancillary Services like those System Ancillary Services set out in Part 2 of CC.8.1, may be agreed to be provided by Users and which can only be utilised by NGET if so agreed.

BC3.1.3 The provision of Frequency control services, if any, from an External System via a DC Converter Station will be provided for in the Ancillary Services Agreement and/or Bilateral Agreement with the DC Converter Station owner and/or any other relevant agreements with the relevant EISO.

BC3.1.4 The provision of Frequency control services, if any, from an Offshore Power Station connected to an Offshore Transmission System that includes a Transmission DC Converter will be facilitated (where necessary) through appropriate data signals provided to the Offshore Power Station by the Relevant Transmission Licensee in accordance with the STC.

BC3.2 OBJECTIVE

The procedure for NGET to direct System Frequency control is intended to enable (as far as possible) NGET to meet the statutory requirements of System Frequency control.

BC3.3 SCOPE

BC3 applies to NGET and to Users, which in this BC3 means:-
(a) **Generators** with regard to their **Large Power Stations** (except those **Large Power Stations** with a **Registered Capacity** less than 50MW comprising of **Power Park Modules**),

(b) **Network Operators**,  

(c) **DC Converter Station** owners,  

(d) other providers of **Ancillary Services**, and  

(e) **Externally Interconnected System Operators**.

**BC3.4 MANAGING SYSTEM FREQUENCY**

**BC3.4.1 Statutory Requirements**

When **NGET** determines it is necessary (by having monitored the **System Frequency**), it will, as part of the procedure set out in **BC2**, issue instructions (including instructions for **Commercial Ancillary Services**) in order to seek to regulate **System Frequency** to meet the statutory requirements of **Frequency control**. **Gensets** (except those comprising of a **Power Park Module** in a **Power Station** with a **Registered Capacity** less than 50MW and those comprising of a **Power Park Module** in Scotland with a **Completion Date** before 1 July 2004) and **DC Converters** at **DC Converter Stations** when transferring **Active Power** to the **Total System**, operating in **Frequency Sensitive Mode** will be instructed by **NGET** to operate taking due account of the **Target Frequency** notified by **NGET**.

**BC3.4.2 Target Frequency**

**NGET** will give 15 minutes notice of variation in **Target Frequency**.

**BC3.4.3 Electric Time**

**NGET** will endeavour (in so far as it is able) to control electric clock time to within plus or minus 10 seconds by specifying changes to **Target Frequency**, by accepting bids and offers in the **Balancing Mechanism**. Errors greater than plus or minus 10 seconds may be temporarily accepted at **NGET's** reasonable discretion.

**BC3.5 RESPONSE FROM GENSETS (AND DC CONVERTERS AT DC CONVERTER STATIONS WHEN TRANSFERRING ACTIVE POWER TO THE TOTAL SYSTEM)**

**BC3.5.1 Capability**

Each **Genset** (except those comprising of **Power Park Modules** in a **Power Station** with a **Registered Capacity** less than 50MW and those comprising of **Power Park Modules** in Scotland with a **Completion Date** before 1 July 2004) and each **DC Converter** at a **DC Converter Station** must at all times have the capability to operate automatically so as to provide response to changes in **Frequency** in accordance with the requirements of **CC.6.3.7** in order to contribute to containing and correcting the **System Frequency** within the statutory requirements of **Frequency control**. For **DC Converters** at **DC Converter Stations**, **BC.3.1.3** also applies. In addition each **Genset** (and each **DC Converter** at a **DC Converter Station**) must at all times have the capability to operate in a **Limited Frequency Sensitive Mode** by operating so as to provide **Limited High Frequency Response**.
**BC3.5.2  Limited Frequency Sensitive Mode**
Each **Synchronised Genset** producing **Active Power** (and each **DC Converter** at a **DC Converter Station**) must operate at all times in a **Limited Frequency Sensitive Mode** (unless instructed in accordance with BC3.5.4 below to operate in **Frequency Sensitive Mode**). Operation in **Limited Frequency Sensitive Mode** must achieve the capability requirement described in CC.6.3.3 for **System Frequencies** up to 50.4Hz and shall be deemed not to be in contravention of CC.6.3.7.
BC3.5.3  
(a) **Existing Gas Cooled Reactor Plant**  
NGET will permit Existing Gas Cooled Reactor Plant other than Frequency Sensitive AGR Units to operate in Limited Frequency Sensitive Mode at all times.

(b) **Power Park Modules** in operation before 1 January 2006  
NGET will permit Power Park Modules in operation before 1 January 2006 to operate in Limited Frequency Sensitive Mode at all times. For the avoidance of doubt Power Park Modules in England and Wales with a Completion Date on or after 1 January 2006 and Power Park Modules in operation in Scotland after 1 January 2006 with a completion date after 1 July 2004 and in a Power Station with a Registered Capacity of 50MW or more will be required to operate in both Limited Frequency Sensitive Mode and Frequency Sensitive Mode of operation depending on System conditions.

BC3.5.4  
**Frequency Sensitive Mode**

(a) NGET may issue an instruction to a Genset (or DC Converter at a DC Converter Station if agreed as described in BC.3.1.3) to operate so as to provide Primary Response and/or Secondary Response and/or High Frequency Response (in the combinations agreed in the relevant Ancillary Services Agreement). When so instructed, the Genset or DC Converter at a DC Converter Station must operate in accordance with the instruction and will no longer be operating in Limited Frequency Sensitive Mode, but by being so instructed will be operating in Frequency Sensitive Mode.

(b) Frequency Sensitive Mode is the generic description for a Genset (or DC Converter at a DC Converter Station) operating in accordance with an instruction to operate so as to provide Primary Response and/or Secondary Response and/or High Frequency Response (in the combinations agreed in the relevant Ancillary Services Agreement).

(c) The magnitude of the response in each of those categories instructed will be in accordance with the relevant Ancillary Services Agreement with the Generator or DC Converter Station owner.

(d) Such instruction will continue until countermanded by NGET or until;

(i) the Genset is De-Synchronised; or

(ii) the DC Converter ceases to transfer Active Power to or from the Total System subject to the conditions of any relevant agreement relating to the operation of the DC Converter Station,

whichever is the first to occur.

(e) NGET will not so instruct Generators in respect of Existing Gas Cooled Reactor Plant other than Frequency Sensitive AGR Units.

(f) NGET will not so instruct Generators in respect of Power Park Modules:

(i) in Scotland in a Power Station with a Completion Date before 1 July 2004; or,
(ii) in a **Power Station** with a **Registered Capacity** of less than 50MW.

(iii) in England and Wales with a **Completion Date** before 1 January 2006.

**BC3.5.5 System Frequency Induced Change**

A **System Frequency** induced change in the **Active Power** output of a **Genset** (or **DC Converter** at a **DC Converter Station**), which assists recovery to **Target Frequency** must not be countermanded by a **Generator** or **DC Converter Station** owner except where it is done purely on safety grounds (relating to either personnel or plant) or, where necessary, to ensure the integrity of the **Power Station** or **DC Converter Station**.

**BC3.6 RESPONSE TO LOW FREQUENCY**

**BC3.6.1 Low Frequency Relay Initiated Response from Gensets and DC Converters at DC Converter Stations**

(a) **NGET** may utilise **Gensets** (and **DC Converters at DC Converter Stations**) with the capability of **Low Frequency Relay** initiated response as:

(i) synchronisation and generation from standstill;

(ii) generation from zero generated output;

(iv) increase in generated output;

(iv) increase in **DC Converter** output to the **Total System** (if so agreed as described in BC3.1.3);

(v) decrease in **DC Converter** input from the **Total System** (if so agreed as described in BC3.1.3);

in establishing its requirements for **Operating Reserve**.

(b) (i) **NGET** will specify within the range agreed with **Generators** and/or **EISOs** and/or **DC Converter Station** owners (if so agreed as described in BC3.1.3), **Low Frequency Relay** settings to be applied to **Gensets** or **DC Converters at DC Converter Stations** pursuant to **BC3.6.1 (a)** and instruct the **Low Frequency Relay** initiated response placed in and out of service.

(ii) **Generators** and/or **EISOs** and/or **DC Converter Station** owners (if so agreed as described in BC3.1.3) will comply with **NGET** instructions for **Low Frequency Relay** settings and **Low Frequency Relay** initiated response to be placed in or out of service. **Generators** or **DC Converter Station** owners or **EISOs** may not alter such **Low Frequency Relay** settings or take **Low Frequency Relay** initiated response out of service without **NGET**'s agreement (such agreement not to be unreasonably withheld or delayed), except for safety reasons.
BC3.6.2  **Low Frequency Relay Initiated Response from Demand and other Demand modification arrangements (which may include a DC Converter Station when importing Active Power from the Total System)**

(a) **NGET** may, pursuant to an Ancillary Services Agreement, utilise **Demand** with the capability of **Low Frequency Relay** initiated **Demand reduction** in establishing its requirements for **Frequency Control**.

(b) (i) **NGET** will specify within the range agreed the **Low Frequency Relay** settings to be applied pursuant to BC3.6.2 (a), the amount of **Demand reduction** to be available and will instruct the **Low Frequency Relay** initiated response to be placed in or out of service.

(ii) **Users** will comply with **NGET** instructions for **Low Frequency Relay** settings and **Low Frequency Relay** initiated **Demand reduction** to be placed in or out of service. **Users** may not alter such **Low Frequency Relay** settings or take **Low Frequency Relay** initiated response out of service without **NGET**'s agreement, except for safety reasons.

(iii) In the case of any such **Demand** which is **Embedded**, **NGET** will notify the relevant **Network Operator** of the location of the **Demand**, the amount of **Demand reduction** to be available, and the **Low Frequency Relay** settings.

(c) **NGET** may also utilise other **Demand** modification arrangements pursuant to an agreement for **Ancillary Services**, in order to contribute towards **Operating Reserve**.

BC3.7  **RESPONSE TO HIGH FREQUENCY REQUIRED FROM SYNCHRONISED GENSETS (AND DC CONVERTERS AT DC CONVERTER STATIONS WHEN TRANSFERRING ACTIVE POWER TO THE TOTAL SYSTEM)**

BC3.7.1 **Plant in Frequency Sensitive Mode** instructed to provide **High Frequency Response**

(a) Each **Synchronised Genset** (or each **DC Converter** at a **DC Converter Station**) in respect of which the **Generator** or **DC Converter Station** owner and/or **EISO** has been instructed to operate so as to provide **High Frequency Response**, which is producing **Active Power** and which is operating above the **Designed Minimum Operating Level**, is required to reduce **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**). The **Target Frequency** is normally 50.00 Hz except where modified as specified under BC3.4.2.

(b) (i) The rate of change of **Active Power** output with respect to **Frequency** up to 50.5 Hz shall be in accordance with the provisions of the relevant **Ancillary Services Agreement** with each **Generator** or **DC Converter Station** owner. If more than one rate is provided for in the **Ancillary Services Agreement** **NGET** will instruct the rate when the instruction to operate to provide **High Frequency Response** is given.
(ii) The reduction in Active Power output by the amount provided for in the relevant Ancillary Services Agreement must be fully achieved within 10 seconds of the time of the Frequency increase and must be sustained at no lesser reduction thereafter.

(iii) It is accepted that the reduction in Active Power output may not be to below the Designed Minimum Operating Level.

(c) In addition to the High Frequency Response provided, the Genset (or DC Converter at a DC Converter Station) must continue to reduce Active Power output in response to an increase in System Frequency above 50.5 Hz at a minimum rate of 2 per cent of output per 0.1 Hz deviation of System Frequency above that level, such reduction to be achieved within five minutes of the rise to or above 50.5 Hz. For a Power Station with a Completion Date after 1st January 2009 this reduction in Active Power should be delivered in accordance with in (i) to (iv) below. For the avoidance of doubt, the provision of this reduction in Active Power output is not an Ancillary Service.

(i) The reduction in Active Power output must be continuously and linearly proportional as far as practical, to the excess of Frequency above 50.5 Hz and must be provided increasingly with time over the period specified in (iii) below.

(ii) As much as possible of the proportional reduction in Active Power output must result from the frequency control device (or speed governor) action and must be achieved within 10 seconds of the time of the Frequency increase above 50.5 Hz.

(iii) The residue of the proportional reduction in Active Power output which results from automatic action of the Genset (or DC Converter at a DC Converter Station) output control devices other than the frequency control devices (or speed governors) must be achieved within 3 minutes from the time of the Frequency increase above 50.5 Hz.

(iv) Any further residue of the proportional reduction which results from non-automatic action initiated by the Generator or DC Converter Station owner shall be initiated within 2 minutes, and achieved within 5 minutes, of the time of the Frequency increase above 50.5 Hz.

BC3.7.2 Plant in Limited Frequency Sensitive Mode

(a) Each Synchronised Genset (or DC Converter at a DC Converter Station) operating in a Limited Frequency Sensitive Mode which is producing Active Power is also required to reduce Active Power output in response to System Frequency when this rises above 50.4 Hz. In the case of DC Converters at DC Converter Stations, the provisions of BC.3.7.7 are also applicable. For the avoidance of doubt, the provision of this reduction in Active Power output is not an Ancillary Service. Such provision is known as "Limited High Frequency Response".

(b) (i) The rate of change of Active Power output must be at a minimum rate of 2 per cent of output per 0.1 Hz deviation of System Frequency above 50.4 Hz.
(ii) The reduction in Active Power output must be continuously and linearly proportional, as far as is practicable, to the excess of Frequency above 50.4 Hz and must be provided increasingly with time over the period specified in (iii) below.

(iii) As much as possible of the proportional reduction in Active Power output must result from the frequency control device (or speed governor) action and must be achieved within 10 seconds of the time of the Frequency increase above 50.4 Hz.

(iv) The residue of the proportional reduction in Active Power output which results from automatic action of the Genset (or DC Converter at a DC Converter Station) output control devices other than the frequency control devices (or speed governors) must be achieved within 3 minutes from the time of the Frequency increase above 50.4 Hz.

(v) Any further residue of the proportional reduction which results from non-automatic action initiated by the Generator or DC Converter Station owner shall be initiated within 2 minutes, and achieved within 5 minutes, of the time of the Frequency increase above 50.4 Hz.

(c) Each Genset (or DC Converter at a DC Converter Station) which is providing Limited High Frequency Response in accordance with this BC3.7.2 must continue to provide it until the Frequency has returned to or below 50.4 Hz or until otherwise instructed by NGET.

BC3.7.3 Plant operation to below Minimum Generation

(a) As stated in CC.A.3.2, steady state operation below Minimum Generation is not expected but if System operating conditions cause operation below Minimum Generation which give rise to operational difficulties for the Genset (or DC Converter at a DC Converter Station) then NGET should not, upon request, unreasonably withhold issuing a Bid-Offer Acceptance to return the Generating Unit or CCGT Module or Power Park Module or DC Converter to an output not less than Minimum Generation. In the case of a DC Converter not participating in the Balancing Mechanism, then NGET will, upon request, attempt to return the DC Converter to an output not less than Minimum Generation or to zero transfer or to reverse the transfer of Active Power.

(b) It is possible that a Synchronised Genset (or a DC Converter at a DC Converter Station) which responded as required under BC3.7.1 or BC3.7.2 to an excess of System Frequency, as therein described, will (if the output reduction is large or if the Genset (or a DC Converter at a DC Converter Station) output has reduced to below the Designed Minimum Operating Level) trip after a time.

(c) All reasonable efforts should in the event be made by the Generator or DC Converter Station owner to avoid such tripping, provided that the System Frequency is below 52Hz.

(d) If the System Frequency is at or above 52Hz, the requirement to make all reasonable efforts to avoid tripping does not apply and the Generator or DC Converter Station owner is required to take action to
protect the Generating Units, Power Park Modules or DC Converters as specified in CC.6.3.13.

(e) In the event of the System Frequency becoming stable above 50.5Hz, after all Genset and DC Converter action as specified in BC3.7.1 and BC3.7.2 has taken place, NGET will issue appropriate Bid-Offer Acceptances and/or Ancillary Service instructions, which may include Emergency Instructions under BC2 to trip Gensets (or, in the case of DC Converters at DC Converter Stations, to stop or reverse the transfer of Active Power) so that the Frequency returns to below 50.5Hz and ultimately to Target Frequency.

(f) If the System Frequency has become stable above 52 Hz, after all Genset and DC Converter action as specified in BC3.7.1 and BC3.7.2 has taken place, NGET will issue Emergency Instructions under BC2 to trip appropriate Gensets (or in the case of DC Converters at DC Converter Stations to stop or reverse the transfer of Active Power) to bring the System Frequency to below 52Hz and follow this with appropriate Bid-Offer Acceptances or Ancillary Service instructions or further Emergency Instructions under BC2 to return the System Frequency to below 50.5 Hz and ultimately to Target Frequency.

BC3.7.4 The Generator or DC Converter Station owner will not be in breach of any of the provisions of BC2 by following the provisions of BC3.7.1, BC3.7.2 or BC3.7.3.

BC3.7.5 Information update to NGET
In order that NGET can deal with the emergency conditions effectively, it needs as much up to date information as possible and accordingly NGET must be informed of the action taken in accordance with BC3.7.1(c) and BC3.7.2 as soon as possible and in any event within 7 minutes of the rise in System Frequency, directly by telephone from the Control Point for the Power Station or DC Converter Station.

BC3.7.6 (a) Existing Gas Cooled Reactor Plant
For the avoidance of doubt, Generating Units within Existing Gas Cooled Reactor Plant are required to comply with the applicable provisions of this BC3.7 (which, for the avoidance of doubt, other than for Frequency Sensitive AGR Units, do not include BC3.7.1).

(b) Power Park Modules in operation before 1 January 2006.
For the avoidance of doubt, Power Park Modules in operation (irrespective of their Completion Dates) before 1 January 2006 are required to comply with the applicable provisions of this BC3.7 (which, for the avoidance of doubt do not include BC3.7.1).

BC3.7.7 Externally Interconnected System Operators
NGET will use reasonable endeavours to ensure that, if System Frequency rises above 50.4Hz, and an Externally Interconnected System Operator (in its role as operator of the External System) is transferring power into the National Electricity Transmission System from its External System, the amount of power transferred in to the National Electricity Transmission System from the System of that Externally Interconnected System Operator is reduced at a rate equivalent to (or greater than) that which applies for Synchronised Gensets operating in Limited Frequency Sensitive Mode which are producing Active Power. This will be done either by utilising existing arrangements which are designed to achieve this, or by issuing Emergency Instructions under BC2.
### DATA REGISTRATION CODE

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DATA REGISTRATION CODE

DRC.1 INTRODUCTION

DRC.1.1 The Data Registration Code ("DRC") presents a unified listing of all data required by NGET from Users and by Users from NGET, from time to time under the Grid Code. The data which is specified in each section of the Grid Code is collated here in the DRC. Where there is any inconsistency in the data requirements under any particular section of the Grid Code and the Data Registration Code the provisions of the particular section of the Grid Code shall prevail.

DRC.1.2 The DRC identifies the section of the Grid Code under which each item of data is required.

DRC.1.3 The Code under which any item of data is required specifies procedures and timings for the supply of that data, for routine updating and for recording temporary or permanent changes to that data. All timetables for the provision of data are repeated in the DRC.

DRC.1.4 Various sections of the Grid Code also specify information which the Users will receive from NGET. This information is summarised in a single schedule in the DRC (Schedule 9).

DRC.2 OBJECTIVE

The objective of the DRC is to:

DRC.2.1 List and collate all the data to be provided by each category of User to NGET under the Grid Code.

DRC.2.2 List all the data to be provided by NGET to each category of User under the Grid Code.

DRC.3 SCOPE

DRC.3.1 The DRC applies to NGET and to Users, which in this DRC means:-

(a) Generators;

(b) Network Operators;

(c) DC Converter Station owners

(d) Suppliers;

(e) Non-Embedded Customers (including, for the avoidance of doubt, a Pumped Storage Generator in that capacity);

(f) Externally Interconnected System Operators;
DRC.4 DATA CATEGORIES AND STAGES IN REGISTRATION

DRC.4.1.1 Within the DRC each data item is allocated to one of the following three categories:

(a) Standard Planning Data (SPD)
(b) Detailed Planning Data (DPD)
(c) Operational Data

DRC.4.2 Standard Planning Data (SPD)

DRC.4.2.1 The Standard Planning Data listed and collated in this DRC is that data listed in Part 1 of the Appendix to the PC.

DRC.4.2.2 Standard Planning Data will be provided to NGET in accordance with PC.4.4 and PC.A.1.2.

DRC.4.3 Detailed Planning Data (DPD)

DRC.4.3.1 The Detailed Planning Data listed and collated in this DRC is that data listed in Part 2 of the Appendix to the PC.

DRC.4.3.2 Detailed Planning Data will be provided to NGET in accordance with PC.4.4, PC.4.5 and PC.A.1.2.

DRC.4.4 Operational Data

DRC.4.4.1 Operational Data is data which is required by the Operating Codes and the Balancing Codes. Within the DRC, Operational Data is sub-categorised according to the Code under which it is required, namely OC1, OC2, BC1 or BC2.

DRC.4.4.2 Operational Data is to be supplied in accordance with timetables set down in the relevant Operating Codes and Balancing Codes and repeated in tabular form in the schedules to the DRC.

DRC.5 PROCEDURES AND RESPONSIBILITIES

DRC.5.1 Responsibility for Submission and Updating of Data

In accordance with the provisions of the various sections of the Grid Code, each User must submit data as summarised in DRC.6 and listed and collated in the attached schedules.
DRC.5.2 Methods of Submitting Data

DRC.5.2.1 Wherever possible the data schedules to the **DRC** are structured to serve as standard formats for data submission and such format must be used for the written submission of data to **NGET**.

DRC.5.2.2 Data must be submitted to the **Transmission Control Centre** notified by **NGET** or to such other department or address as **NGET** may from time to time advise. The name of the person at the **User** who is submitting each schedule of data must be included.

DRC.5.2.3 Where a computer data link exists between a **User** and **NGET**, data may be submitted via this link. **NGET** will, in this situation, provide computer files for completion by the **User** containing all the data in the corresponding **DRC** schedule.

Data submitted can be in an electronic format using a proforma to be supplied by **NGET** or other format to be agreed annually in advance with **NGET**. In all cases the data must be complete and relate to, and relate only to, what is required by the relevant section of the **Grid Code**.

DRC.5.2.4 Other modes of data transfer, such as magnetic tape, may be utilised if **NGET** gives its prior written consent.

DRC.5.3 Changes to Users' Data

DRC.5.3.1 Whenever a **User** becomes aware of a change to an item of data which is registered with **NGET** the **User** must notify **NGET** in accordance with each section of the **Grid Code**. The method and timing of the notification to **NGET** is set out in each section of the **Grid Code**.

DRC.5.4 Data not Supplied

DRC.5.4.1 **Users** and **NGET** are obliged to supply data as set out in the individual sections of the **Grid Code** and repeated in the **DRC**. If a **User** fails to supply data when required by any section of the **Grid Code**, **NGET** will estimate such data if and when, in the **NGET's** view, it is necessary to do so. If **NGET** fails to supply data when required by any section of the **Grid Code**, the **User** to whom that data ought to have been supplied, will estimate such data if and when, in that **User's** view, it is necessary to do so. Such estimates will, in each case, be based upon data supplied previously for the same **Plant** or **Apparatus** or upon corresponding data for similar **Plant** or **Apparatus** or upon such other information as **NGET** or that **User**, as the case may be, deems appropriate.

DRC.5.4.2 **NGET** will advise a **User** in writing of any estimated data it intends to use pursuant to DRC.5.4.1 relating directly to that **User's Plant** or **Apparatus** in the event of data not being supplied.

DRC.5.4.3 A **User** will advise **NGET** in writing of any estimated data it intends to use pursuant to DRC.5.4.1 in the event of data not being supplied.
DRC.5.5  
**Substituted Data**

DRC.5.5.1  
In the case of PC.A.4 only, if the data supplied by a **User** does not in **NGET's** reasonable opinion reflect the equivalent data recorded by **NGET**, **NGET** may estimate such data if and when, in the view of **NGET**, it is necessary to do so. Such estimates will, in each case, be based upon data supplied previously for the same **Plant** or **Apparatus** or upon corresponding data for similar **Plant** or **Apparatus** or upon such other information as **NGET** deems appropriate.

DRC.5.5.2  
**NGET** will advise a **User** in writing of any estimated data it intends to use pursuant to DRC.5.5.1 relating directly to that **User's Plant** or **Apparatus** where it does not in **NGET's** reasonable opinion reflect the equivalent data recorded by **NGET**. Such estimated data will be used by **NGET** in place of the appropriate data submitted by the **User** pursuant to PC.A.4 and as such shall be deemed to accurately represent the **User's** submission until such time as the **User** provides data to **NGET's** reasonable satisfaction.

DRC.6  
**DATA TO BE REGISTERED**

DRC.6.1  
Schedules 1 to 15 attached cover the following data areas.

DRC.6.1.1  
**SCHEDULE 1 - GENERATING UNIT (OR CCGT Module), POWER PARK MODULE and DC CONVERTER TECHNICAL DATA.**

Comprising **Generating Unit** (and CCGT Module), **Power Park Module** and **DC Converter** fixed electrical parameters.

DRC.6.1.2  
**SCHEDULE 2 - GENERATION PLANNING PARAMETERS**

Comprising the **Genset** parameters required for **Operational Planning** studies.

DRC.6.1.3  
**SCHEDULE 3 - LARGE POWER STATION OUTAGE PROGRAMMES, OUTPUT USABLE AND INFLEXIBILITY INFORMATION.**

Comprising generation outage planning, **Output Usable** and inflexibility information at timescales down to the daily **BM Unit Data** submission.

DRC.6.1.4  
**SCHEDULE 4 - LARGE POWER STATION DROOP AND RESPONSE DATA.**

Comprising data on governor **Droop** settings and **Primary**, **Secondary** and **High Frequency Response** data for **Large Power Stations**.

DRC.6.1.5  
**SCHEDULE 5 - USER'S SYSTEM DATA.**

Comprising electrical parameters relating to **Plant** and **Apparatus** connected to the **National Electricity Transmission System**.

DRC.6.1.6  
**SCHEDULE 6 - USERS OUTAGE INFORMATION.**

Comprising the information required by **NGET** for outages on the **Users System**, including outages at **Power Stations** other than outages of **Gensets**

DRC.6.1.7  
**SCHEDULE 7 - LOAD CHARACTERISTICS.**

Comprising the estimated parameters of load groups in respect of, for example, harmonic content and response to frequency.
DRC.6.1.8 SCHEDULE 8 - **BM UNIT DATA.**

DRC.6.1.9 SCHEDULE 9 - **DATA SUPPLIED BY NGET TO USERS.**

DRC.6.1.10 SCHEDULE 10 - **DEMAND PROFILES AND ACTIVE ENERGY DATA**

Comprising information relating to the **Network Operators’** and **Non-Embedded Customers’** total **Demand** and **Active Energy** taken from the **National Electricity Transmission System**

DRC.6.1.11 SCHEDULE 11 - **CONNECTION POINT DATA**

Comprising information relating to **Demand**, demand transfer capability and a summary of the **Small Power Station, Medium Power Station** and **Customer generation** connected to the **Connection Point**

DRC.6.1.12 SCHEDULE 12 - **DEMAND CONTROL DATA**

Comprising information related to **Demand Control**

DRC.6.1.13 SCHEDULE 13 - **FAULT INFEED DATA**

Comprising information relating to the Short Circuit contribution to the **National Electricity Transmission System** from **Users** other than **Generators** and **DC Converter Station owners**.

DRC.6.1.14 SCHEDULE 14 - **FAULT INFEED DATA**

Comprising information relating to the Short Circuit contribution to the **National Electricity Transmission System** from **Generators** and **DC Converter Station owners**.

DRC.6.1.15 SCHEDULE 15 – **MOTHBALED GENERATING UNIT, MOTHBALED POWER PARK MODULE, MOTHBALED DC CONVERTERS AT A DC CONVERTER STATION AND ALTERNATIVE FUEL DATA**

Comprising information relating to estimated return to service times for **Mothballed Generating Units**, **Mothballed Power Park Modules** and **Mothballed DC Converters at a DC Converter Station** and the capability of gas-fired **Generating Units** to operate using alternative fuels.

DRC.6.1.16 SCHEDULE 16 – **BLACK START INFORMATION**

Comprising information relating to **Black Start.**

DRC.6.1.17 SCHEDULE 17 – **ACCESS PERIOD SCHEDULE**

Comprising **Access Period** information for **Transmission Interface Circuits** within an **Access Group.**
### DRC.6.2

The **Schedules** applicable to each class of **User** are as follows:

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<td>Generators with Medium Power Stations (See notes 2, 3, 4)</td>
<td>Sched 1, 2 (part), 9, 14, 15</td>
</tr>
<tr>
<td>Generators with Small Power Stations directly connected to the National Electricity Transmission System</td>
<td>Sched 1, 6, 14, 15</td>
</tr>
<tr>
<td>All Users connected directly to the National Electricity Transmission System</td>
<td>Sched 5, 6, 9</td>
</tr>
<tr>
<td>All Users connected directly to the National Electricity Transmission System other than Generators</td>
<td>Sched 10,11,13,17</td>
</tr>
<tr>
<td>A Pumped Storage Generator, Externally Interconnected System Operator and Interconnector Users</td>
<td>Sched 12 (as marked)</td>
</tr>
<tr>
<td>All Suppliers</td>
<td>Sched 12</td>
</tr>
<tr>
<td>All Network Operators</td>
<td>Sched 12</td>
</tr>
<tr>
<td>All BM Participants</td>
<td>Sched 8</td>
</tr>
<tr>
<td>All DC Converter Station owners</td>
<td>Sched 1, 4, 9, 14, 15</td>
</tr>
</tbody>
</table>

**Notes:**

1. **Network Operators** must provide data relating to **Small Power Stations** and/or **Customer Generating Plant Embedded** in their **Systems** when such data is requested by **NGET** pursuant to PC.A.3.1.4 or PC.A.5.1.4.

2. The data in schedules 1, 14 and 15 need not be supplied in relation to **Medium Power Stations** connected at a voltage level below the voltage level of the **Subtransmission System** except in connection with a **CUSC Contract** or unless specifically requested by **NGET**.

3. Each **Network Operator** within whose **System** an **Embedded Medium Power Station** not subject to a **Bilateral Agreement** or **Embedded DC Converter Station** not subject to a **Bilateral Agreement** is situated shall provide the data to **NGET** in respect of each such **Embedded Medium Power Station** or **Embedded DC Converter Station**.

4. In the case of Schedule 2, **Generators, DC Converter Station owners** or **Network Operators** in the case of **Embedded Medium Power Stations**
not subject to a Bilateral Agreement or Embedded DC Converter Stations not subject to a Bilateral Agreement, would only be expected to submit data in relation to Standard Planning Data as required by the Planning Code.
ABBREVIATIONS:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPD</td>
<td>Standard Planning Data</td>
</tr>
<tr>
<td>% on MVA</td>
<td>% on Rated MVA</td>
</tr>
<tr>
<td>% on 100</td>
<td>% on 100 MVA</td>
</tr>
<tr>
<td>DPD</td>
<td>Detailed Planning Data</td>
</tr>
<tr>
<td>RC</td>
<td>Registered Capacity</td>
</tr>
<tr>
<td>OC1, BC1, etc</td>
<td>Grid Code for which data is required</td>
</tr>
<tr>
<td>CUSC Contract</td>
<td>User data which may be submitted to the Relevant Transmission Licensees by NGET, following the acceptance by a User of a CUSC Contract</td>
</tr>
<tr>
<td>CUSC App. Form</td>
<td>User data which may be submitted to the Relevant Transmission Licensees by NGET, following an application by a User for a CUSC Contract</td>
</tr>
</tbody>
</table>

Note:

All parameters, where applicable, are to be measured at nominal System Frequency

+ - these SPD items should only be given in the data supplied with the application for a CUSC Contract.

* - Asterisk items are not required for Small Power Stations and Medium Power Stations

Information is to be given on a Unit basis, unless otherwise stated. Where references to CCGT Modules are made, the columns “G1” etc should be amended to read “M1” etc, as appropriate

□ - These data items may be submitted to the Relevant Transmission Licensees from NGET in respect of the National Electricity Transmission System. The data may be submitted to the Relevant Transmission Licensees in a summarised form e.g. network model; the data transferred will have been originally derived from data submitted by Users to NGET.

■ - these data items may be submitted to the Relevant Transmission Licensee from NGET in respect to Relevant Units only. The data may be submitted to the Relevant Transmission Licensee in a summarised form e.g. network model; the data transferred will have been originally derived from data submitted by Users to NGET.
<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA to RTL</th>
<th>DATA CAT.</th>
<th>GENERATING UNIT OR STATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CUSC Cont</td>
<td>CUSC App. Form</td>
<td>FYr 0</td>
</tr>
<tr>
<td><strong>GENERATING STATION DEMANDS:</strong></td>
<td></td>
<td></td>
<td></td>
<td>G1</td>
</tr>
<tr>
<td>Demand associated with the Power Station</td>
<td>MW</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>supplied through the National Electricity</td>
<td>Mvar</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Transmission System or the Generator's User System</td>
<td>MW</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(PC.A.5.2)</td>
<td>Mvar</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>- The maximum Demand that could occur.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Demand at specified time of annual peak half hour</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of National Electricity Transmission System Demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>at Annual ACS Conditions.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Demand at specified time of annual minimum half-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hour of National Electricity Transmission System</td>
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<td></td>
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</tr>
<tr>
<td>Demand.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>(Additional Demand supplied through the unit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>transformers to be provided below)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>INDIVIDUAL GENERATING UNIT (OR AS THE CASE MAY BE,</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>CCGT MODULE) DATA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Point of connection to the National Electricity</td>
<td>Text</td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>Transmission System (or the Total System if embedded)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of the Generating Unit (other than a CCGT Unit) or the</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCGT Module, as the case may be in terms of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>geographical and electrical location and system</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>voltage (PC.A.3.4.1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If the busbars at the Connection Point are normally</td>
<td>Section</td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>run in separate sections identify the section to</td>
<td>Number</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>which the Generating Unit (other than a CCGT Unit) or</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCGT Module, as the case may be is connected</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(PC.A.3.1.5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of Unit (steam, Gas Turbine Combined Cycle</td>
<td></td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>Gas Turbine Unit, tidal, wind, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(PC.A.3.2.2 (h))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A list of the CCGT Units within a CCGT Module,</td>
<td></td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>identifying each CCGT Unit, and the CCGT Module</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>of which it forms part, unambiguously. In the case of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a Range CCGT Module, details of the possible</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>configurations should also be submitted.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(PC.A.3.2.2 (g))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATA DESCRIPTION</td>
<td>UNITS</td>
<td>DATA to RTL</td>
<td>DATA CAT.</td>
<td>GENERATING UNIT (OR CCGT MODULE, AS THE CASE MAY BE)</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------------</td>
<td>-------------</td>
<td>-------------</td>
<td>-----------</td>
<td>-----------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CUSC Contr.</td>
<td>CUSC App. Form</td>
<td>G1</td>
</tr>
<tr>
<td>Rated MVA <em>(PC.A.3.3.1)</em></td>
<td>MVA</td>
<td>□</td>
<td>■</td>
<td>SPD+</td>
</tr>
<tr>
<td>Rated MW <em>(PC.A.3.3.1)</em></td>
<td>MW</td>
<td>□</td>
<td>■</td>
<td>SPD+</td>
</tr>
<tr>
<td>Rated terminal voltage <em>(PC.A.5.3.2.(a) &amp; PC.A.5.4.2 (b))</em></td>
<td>kV</td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>*Performance Chart at Onshore Synchronous Generating Unit stator terminals <em>(PC.A.3.2.2(f)(i))</em></td>
<td>MW</td>
<td>SPD</td>
<td></td>
<td>(see OC2 for specification)</td>
</tr>
<tr>
<td>* Performance Chart of the Offshore Synchronous Generating Unit at the Offshore Grid Entry Point <em>(PC.A.3.2.2(f)(ii))</em></td>
<td>MW</td>
<td>SPD</td>
<td></td>
<td>(except in relation to CCGT Modules when required on a unit basis under the Grid Code, this data item may be supplied under Schedule 3)</td>
</tr>
<tr>
<td>*Output Usable (on a monthly basis) <em>(PC.A.3.2.2(b))</em></td>
<td>MW</td>
<td>SPD+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turbo-Generator inertia constant (for synchronous machines) <em>(PC.A.5.3.2(a))</em></td>
<td>MW secs</td>
<td>□</td>
<td>■</td>
<td>SPD+</td>
</tr>
<tr>
<td>Short circuit ratio (synchronous machines) <em>(PC.A.5.3.2(a))</em></td>
<td>/MVA</td>
<td>□</td>
<td>■</td>
<td>SPD+</td>
</tr>
<tr>
<td>Normal auxiliary load supplied by the Generating Unit at rated MW output <em>(PC.A.5.2.1)</em></td>
<td>MW</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated field current at rated MW and Mvar output and at rated terminal voltage <em>(PC.A.5.3.2 (a))</em></td>
<td>A</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field current open circuit saturation curve (as derived from appropriate manufacturers' test certificates): <em>(PC.A.5.3.2 (a))</em></td>
<td>A</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>120% rated terminal volts</td>
<td></td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>110% rated terminal volts</td>
<td></td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>100% rated terminal volts</td>
<td></td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>90% rated terminal volts</td>
<td></td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>80% rated terminal volts</td>
<td></td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>70% rated terminal volts</td>
<td></td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>60% rated terminal volts</td>
<td></td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>50% rated terminal volts</td>
<td></td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>IMPEDANCES:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct axis synchronous reactance <em>(PC.A.5.3.2(a))</em></td>
<td>MVA</td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>Direct axis transient reactance <em>(PC.A.3.3.1(a)&amp; PC.A.5.3.2(a))</em></td>
<td>MVA</td>
<td>□</td>
<td>■</td>
<td>SPD+</td>
</tr>
<tr>
<td>Direct axis sub-transient reactance <em>(PC.A.5.3.2(a))</em></td>
<td>MVA</td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>Quad axis synch reactance <em>(PC.A.5.3.2(a))</em></td>
<td>MVA</td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>Quad axis sub-transient reactance <em>(PC.A.5.3.2(a))</em></td>
<td>MVA</td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>Stator leakage reactance <em>(PC.A.5.3.2(a))</em></td>
<td>MVA</td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>Armature winding direct current resistance, <em>(PC.A.5.3.2(a))</em></td>
<td>MVA</td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>In Scotland, negative sequence resistance <em>(PC.A.2.5.6 (a) / iv)</em></td>
<td>MVA</td>
<td>□</td>
<td></td>
<td>DPD</td>
</tr>
</tbody>
</table>

Note:- the above data item relating to armature winding direct-current resistance need only be provided by Generators in relation to Generating Units commissioned after 1st March 1996 and in cases where, for whatever reason, the Generator is aware of the value of the data item.
<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA to RTL</th>
<th>DATA in CAT.</th>
<th>GENERATING UNIT OR STATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TIME CONSTANTS</strong></td>
<td></td>
<td></td>
<td></td>
<td>G1</td>
</tr>
<tr>
<td>(Short-circuit and Unsaturated)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct axis transient time constant</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>(PC.A.5.3.2(a))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct axis sub-transient time constant</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>(PC.A.5.3.2(a))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quadrature axis sub-transient time constant</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>(PC.A.5.3.2(a))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stator time constant</td>
<td></td>
<td></td>
<td></td>
<td>S</td>
</tr>
<tr>
<td>(PC.A.5.3.2(a))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GENERATING UNIT STEP-UP TRANSFORMER</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated MVA (PC.A.3.3.1 &amp; PC.A.5.3.2)</td>
<td></td>
<td></td>
<td></td>
<td>MVA □</td>
</tr>
<tr>
<td>Voltage Ratio (PC.A.5.3.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive sequence reactance: (PC.A.5.3.2)</td>
<td></td>
<td></td>
<td></td>
<td>% on MVA □</td>
</tr>
<tr>
<td>Max tap</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min tap</td>
<td></td>
<td></td>
<td></td>
<td>% on MVA □</td>
</tr>
<tr>
<td>Nominal tap</td>
<td></td>
<td></td>
<td></td>
<td>% on MVA □</td>
</tr>
<tr>
<td>Positive sequence resistance: (PC.A.5.3.2)</td>
<td></td>
<td></td>
<td></td>
<td>% on MVA</td>
</tr>
<tr>
<td>Max tap</td>
<td></td>
<td></td>
<td></td>
<td>% on MVA</td>
</tr>
<tr>
<td>Min tap</td>
<td></td>
<td></td>
<td></td>
<td>% on MVA</td>
</tr>
<tr>
<td>Nominal tap</td>
<td></td>
<td></td>
<td></td>
<td>% on MVA</td>
</tr>
<tr>
<td>Zero phase sequence reactance (PC.A.5.3.2)</td>
<td></td>
<td></td>
<td></td>
<td>% on MVA</td>
</tr>
<tr>
<td>Tap change range (PC.A.5.3.2)</td>
<td></td>
<td></td>
<td></td>
<td>+% / -%</td>
</tr>
<tr>
<td>Tap change step size (PC.A.5.3.2)</td>
<td></td>
<td></td>
<td></td>
<td>%</td>
</tr>
<tr>
<td>Tap changer type: on-load or off-circuit</td>
<td></td>
<td></td>
<td></td>
<td>On/Off</td>
</tr>
<tr>
<td>(PC.A.5.3.2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>EXCITATION</strong></td>
<td></td>
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</tr>
<tr>
<td>Note:</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>The data items requested under Option 1 below may continue to be provided by Generators in relation to Generating Units on the System at 9 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 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 is aware of the data items listed under Option 2 in relation to that Generating Unit.</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Option 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC gain of Excitation Loop (PC.A.5.3.2(c))</td>
<td></td>
<td></td>
<td></td>
<td>□</td>
</tr>
<tr>
<td>Max field voltage (PC.A.5.3.2(c))</td>
<td></td>
<td></td>
<td></td>
<td>V □</td>
</tr>
<tr>
<td>Min field voltage (PC.A.5.3.2(c))</td>
<td></td>
<td></td>
<td></td>
<td>V □</td>
</tr>
<tr>
<td>Rated field voltage (PC.A.5.3.2(c))</td>
<td></td>
<td></td>
<td></td>
<td>V □</td>
</tr>
<tr>
<td>Max rate of change of field volts: (PC.A.5.3.2(c))</td>
<td></td>
<td></td>
<td></td>
<td>V/Sec □</td>
</tr>
<tr>
<td>Rising</td>
<td></td>
<td></td>
<td></td>
<td>V/Sec □</td>
</tr>
<tr>
<td>Falling</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Details of Excitation Loop (PC.A.5.3.2(c))</td>
<td></td>
<td></td>
<td></td>
<td>Diagram □</td>
</tr>
<tr>
<td>Described in block diagram form showing transfer functions of individual elements</td>
<td></td>
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<tr>
<td>Dynamic characteristics of over-excitation limiter (PC.A.5.3.2(c))</td>
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</tr>
<tr>
<td>Dynamic characteristics of under-excitation limiter (PC.A.5.3.2(c))</td>
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<td>□</td>
</tr>
</tbody>
</table>
### DATA DESCRIPTION

| Option 2 | Exciter category, e.g. Rotating Exciter, or Static Exciter etc (PC.A.5.3.2(c)) | Text □ SPD |
| Excitation System Nominal (PC.A.5.3.2(c)) | V<sub>E</sub> | SEC<sup>-1</sup> □ DPD |
| Rated Field Voltage (PC.A.5.3.2(c)) | U<sub>IN</sub> | V □ DPD |
| No-load Field Voltage (PC.A.5.3.2(c)) | U<sub>IO</sub> | V □ DPD |
| Excitation System On-Load (PC.A.5.3.2(c)) | V | □ DPD |
| Positive Ceiling Voltage | U<sub>PL</sub> | □ DPD |
| Excitation System No-Load (PC.A.5.3.2(c)) | V | □ DPD |
| Positive Ceiling Voltage | U<sub>PO</sub> | □ DPD |
| Excitation System No-Load (PC.A.5.3.2(c)) | V | □ DPD |
| Negative Ceiling Voltage | U<sub>PO</sub> | □ DPD |
| Power System Stabiliser (PSS) (PC.A.3.4.2) fitted | Yes/No □ SPD |
| Details of Excitation System (PC.A.5.3.2(c)) (including PSS if fitted) described in block diagram form showing transfer functions of individual elements. | Diagram □ DPD |
| Details of Over-excitation Limiter (PC.A.5.3.2(c)) described in block diagram form showing transfer functions of individual elements. | Diagram □ DPD |
| Details of Under-excitation Limiter (PC.A.5.3.2(c)) described in block diagram form showing transfer functions of individual elements. | Diagram □ DPD |
### GOVERNOR AND ASSOCIATED PRIME MOVER PARAMETERS

**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 9 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.

#### Option 1

**GOVERNOR PARAMETERS (REHEAT UNITS) (PC.A.5.3.2(d) – Option 1(ⅱ))**

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA to RTL CAT.</th>
<th>DATA CAT.</th>
<th>GENERATING UNIT OR STATION DATA</th>
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</thead>
<tbody>
<tr>
<td>HP Governor average gain</td>
<td>MW/Hz</td>
<td>DPD</td>
<td></td>
<td>G1 G2 G3 G4 G5 G6 STN</td>
</tr>
<tr>
<td>Speeder motor setting range</td>
<td>Hz</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP governor valve time constant</td>
<td>S</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP governor valve opening limits</td>
<td></td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HP governor valve rate limits</td>
<td></td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Re-heat time constant (stored Active Energy in reheater)</td>
<td>S</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP governor average gain</td>
<td>MW/Hz</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP governor setting range</td>
<td>Hz</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP governor time constant</td>
<td>S</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP governor valve opening limits</td>
<td></td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IP governor valve rate limits</td>
<td></td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Details of acceleration sensitive elements HP &amp; IP in governor loop</td>
<td></td>
<td>DPD (please attach)</td>
<td></td>
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<tr>
<td>Governor block diagram showing transfer functions of individual elements</td>
<td></td>
<td>DPD (please attach)</td>
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**GOVERNOR (Non-reheat steam and Gas Turbines) (PC.A.5.3.2(d) – Option 1(ⅲ))**

<table>
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<tr>
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<th>DATA to RTL CAT.</th>
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<th>GENERATING UNIT OR STATION DATA</th>
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<tr>
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<td>MW/Hz</td>
<td>DPD</td>
<td></td>
<td>G1 G2 G3 G4 G5 G6 STN</td>
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<tr>
<td>Speeder motor setting range</td>
<td>Hz</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governor valve time constant</td>
<td>S</td>
<td>DPD</td>
<td></td>
<td></td>
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<tr>
<td>Governor valve opening limits</td>
<td></td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governor valve rate limits</td>
<td></td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time constant of turbine</td>
<td>S</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Governor block diagram</td>
<td></td>
<td>DPD</td>
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</table>

(please attach)
<table>
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<th>UNITS</th>
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<th>GENERATING UNIT OR STATION DATA</th>
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<tr>
<td><strong>BOILER &amp; STEAM TURBINE DATA</strong></td>
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<tr>
<td>Boiler time constant (Stored Active Energy)</td>
<td>S</td>
<td>DPD</td>
<td>G1</td>
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<tr>
<td>(Proportion of Primary Response arising from HP turbine)</td>
<td>%</td>
<td>DPD</td>
<td></td>
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<tr>
<td>HP turbine response ratio:</td>
<td>%</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(Proportion of High Frequency Response arising from HP turbine)</td>
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<tr>
<td><strong>Option 2</strong></td>
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<tr>
<td>All Generating Units</td>
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<tr>
<td>Governor Block Diagram showing</td>
<td></td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>transfer function of individual elements</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>including acceleration sensitive elements</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Governor Time Constant</td>
<td>Sec</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(Proportion of Governor Deadband)</td>
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<tr>
<td>(Proportion of Governor Time Constant)</td>
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<tr>
<td>- Maximum Setting</td>
<td>±Hz</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>- Normal Setting</td>
<td>±Hz</td>
<td>DPD</td>
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<tr>
<td>- Minimum Setting</td>
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</tr>
<tr>
<td>Speeder Motor Setting Range</td>
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<td>DPD</td>
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<tr>
<td>(Proportion of Speeder Motor Setting Range)</td>
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<tr>
<td>Average Gain (Proportion of Average Gain)</td>
<td>MW/Hz</td>
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<tr>
<td>(Proportion of Steam Units)</td>
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<td>HP Valve Time Constant</td>
<td>sec</td>
<td>DPD</td>
<td></td>
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<tr>
<td>HP Valve Opening Limits</td>
<td>%</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>HP Valve Opening Rate Limits</td>
<td>%/sec</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>HP Valve Closing Rate Limits</td>
<td>%/sec</td>
<td>DPD</td>
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</tr>
<tr>
<td>HP Valve Time Constant</td>
<td>sec</td>
<td>DPD</td>
<td></td>
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<tr>
<td>(Proportion of HP Valve Time Constant)</td>
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<tr>
<td>IP Valve Time Constant</td>
<td>sec</td>
<td>DPD</td>
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</tr>
<tr>
<td>IP Valve Opening Limits</td>
<td>%</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>IP Valve Opening Rate Limits</td>
<td>%/sec</td>
<td>DPD</td>
<td></td>
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<tr>
<td>IP Valve Closing Rate Limits</td>
<td>%/sec</td>
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<td>IP Valve Time Constant</td>
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<td>DPD</td>
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</tr>
<tr>
<td>(Proportion of IP Valve Time Constant)</td>
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<tr>
<td>LP Valve Time Constant</td>
<td>sec</td>
<td>DPD</td>
<td></td>
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<tr>
<td>LP Valve Opening Limits</td>
<td>%</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>LP Valve Opening Rate Limits</td>
<td>%/sec</td>
<td>DPD</td>
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<tr>
<td>LP Valve Closing Rate Limits</td>
<td>%/sec</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>LP Valve Time Constant</td>
<td>sec</td>
<td>DPD</td>
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<tr>
<td>(Proportion of LP Valve Time Constant)</td>
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<tr>
<td>Reheater Time Constant</td>
<td>sec</td>
<td>DPD</td>
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<tr>
<td>Boiler Time Constant</td>
<td>sec</td>
<td>DPD</td>
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</tr>
<tr>
<td>HP Power Fraction</td>
<td>%</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>IP Power Fraction</td>
<td>%</td>
<td>DPD</td>
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</table>

Where the generating unit governor does not have a selectable deadband facility, then the actual value of the deadband need only be provided.
### DATA DESCRIPTION

<table>
<thead>
<tr>
<th>DATA to RTL</th>
<th>DATA CAT.</th>
</tr>
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<tbody>
<tr>
<td>CUSC Contact</td>
<td>CUSC App Form</td>
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<table>
<thead>
<tr>
<th>GENERATING UNIT OR STATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
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</tbody>
</table>

#### Gas Turbine Units

(\textit{PC.A.5.3.2(d)} – Option 2(iii))

- **Inlet Guide Vane Time Constant**: sec □ DPD
- **Inlet Guide Vane Opening Limits**: % □ DPD
- **Inlet Guide Vane Opening Rate Limits**: %/sec □ DPD
- **Inlet Guide Vane Closing Rate Limits**: %/sec □ DPD

(\textit{PC.A.5.3.2(d)} – Option 2(iii))

- **Fuel Valve Time Constant**: sec □ DPD
- **Fuel Valve Opening Limits**: % □ DPD
- **Fuel Valve Opening Rate Limits**: %/sec □ DPD
- **Fuel Valve Closing Rate Limits**: %/sec □ DPD

(\textit{PC.A.5.3.2(d)} – Option 2(iii))

- **Waste Heat Recovery Boiler Time Constant**

#### Hydro Generating Units

(\textit{PC.A.5.3.2(d)} – Option 2(iv))

- **Guide Vane Actuator Time Constant**: sec □ DPD
- **Guide Vane Opening Limits**: % □ DPD
- **Guide Vane Opening Rate Limits**: %/sec □ DPD
- **Guide Vane Closing Rate Limits**: %/sec □ DPD

- **Water Time Constant**: sec □ DPD

#### UNIT CONTROL OPTIONS*

(\textit{PC.A.5.3.2(e)})

- **Maximum droop**: % □ DPD
- **Normal droop**: % □ DPD
- **Minimum droop**: % □ DPD

- **Maximum frequency deadband**: ±Hz □ DPD
- **Normal frequency deadband**: ±Hz □ DPD
- **Minimum frequency deadband**: ±Hz □ DPD

- **Maximum Output deadband**: ±MW □ DPD
- **Normal Output deadband**: ±MW □ DPD
- **Minimum Output deadband**: ±MW □ DPD

Frequency settings between which Unit Load Controller droop applies:

- **Maximum**: Hz □ DPD
- **Normal**: Hz □ DPD
- **Minimum**: Hz □ DPD

Sustained response normally selected: Yes/No □ DPD
<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA to RTL</th>
<th>DATA CAT.</th>
<th>STN</th>
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<tr>
<td>Power Park Module Rated MVA (PC.A.3.3.1(a))</td>
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<td></td>
<td></td>
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<tr>
<td>Power Park Module Rated MW (PC.A.3.3.1(a))</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Performance Chart of a Power Park Module at the connection point (PC.A.3.2.2(b))</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>*Output Usable (on a monthly basis) (PC.A.3.2.2(b))</td>
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<td></td>
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</tr>
<tr>
<td>Number &amp; Type of Power Park Units within each Power Park Module (PC.A.3.2.2(k))</td>
<td></td>
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<td>SPD</td>
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</tr>
<tr>
<td>Number &amp; Type of Offshore Power Park Units within each Offshore Power Park String and the number of Offshore Power Park Strings and connection point within each Offshore Power Park Module (PC.A.3.2.2(k))</td>
<td></td>
<td></td>
<td>SPD</td>
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</tr>
<tr>
<td>Power Park Unit Model - A validated mathematical model in accordance with PC.5.4.2 (a)</td>
<td></td>
<td>Transfer function block diagram and algebraic equations, simulation and measured test results</td>
<td>DPD</td>
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</tr>
<tr>
<td>Power Park Unit Data (where applicable)</td>
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<td></td>
</tr>
<tr>
<td>Rated MVA (PC.A.3.3.1(a))</td>
<td>MVA</td>
<td>□</td>
<td>SPD+</td>
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<tr>
<td>Rated MW (PC.A.3.3.1(e))</td>
<td>MW</td>
<td>□</td>
<td>SPD+</td>
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</tr>
<tr>
<td>Rated terminal voltage (PC.A.3.3.1(e))</td>
<td>V</td>
<td>□</td>
<td>SPD+</td>
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</tr>
<tr>
<td>Site minimum air density (PC.A.5.4.2(b))</td>
<td>kg/m³</td>
<td>□</td>
<td>SPD+</td>
<td></td>
</tr>
<tr>
<td>Site maximum air density</td>
<td>kg/m³</td>
<td>□</td>
<td>SPD+</td>
<td></td>
</tr>
<tr>
<td>Site average air density</td>
<td>kg/m³</td>
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<td>SPD+</td>
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</tr>
<tr>
<td>Year for which air density data is submitted</td>
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<td>□</td>
<td>SPD+</td>
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<td>Number of pole pairs</td>
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<td>□</td>
<td>DPD</td>
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<tr>
<td>Blade swept area</td>
<td>m²</td>
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<td>Gear Box Ratio</td>
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<td>□</td>
<td>DPD</td>
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<tr>
<td>Stator Resistance (PC.A.5.4.2(b))</td>
<td>% on MVA</td>
<td>□</td>
<td>SPD+</td>
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</tr>
<tr>
<td>Stator Reactance (PC.A.3.3.1(e))</td>
<td>% on MVA</td>
<td>□</td>
<td>SPD+</td>
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<tr>
<td>Magnetising Reactance (PC.A.3.3.1(e))</td>
<td>% on MVA</td>
<td>□</td>
<td>SPD+</td>
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<tr>
<td>Rotor Resistance (at starting) (PC.A.5.4.2(b))</td>
<td>% on MVA</td>
<td>□</td>
<td>DPD</td>
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<tr>
<td>Rotor Resistance (at rated running) (PC.A.3.3.1(e))</td>
<td>% on MVA</td>
<td>□</td>
<td>SPD+</td>
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<tr>
<td>Rotor Reactance (at starting) (PC.A.5.4.2(b))</td>
<td>% on MVA</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Equivalent inertia constant of the first mass (e.g. wind turbine rotor and blades) at minimum speed (PC.A.5.4.2(b))</td>
<td>MW secs / MVA</td>
<td>□</td>
<td>SPD+</td>
<td></td>
</tr>
<tr>
<td>Equivalent inertia constant of the first mass (e.g. wind turbine rotor and blades) at synchronous speed (PC.A.5.4.2(b))</td>
<td>MW secs / MVA</td>
<td>□</td>
<td>SPD+</td>
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<tr>
<td>Equivalent inertia constant of the first mass (e.g. wind turbine rotor and blades) at rated speed (PC.A.5.4.2(b))</td>
<td>MW secs / MVA</td>
<td>□</td>
<td>SPD+</td>
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</tr>
<tr>
<td>Equivalent inertia constant of the second mass (e.g. generator rotor) at minimum speed (PC.A.5.4.2(b))</td>
<td>MW secs / MVA</td>
<td>□</td>
<td>SPD+</td>
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<tr>
<td>Equivalent inertia constant of the second mass (e.g. generator rotor) at synchronous speed (PC.A.5.4.2(b))</td>
<td>MW secs / MVA</td>
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<td>SPD+</td>
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<tr>
<td>Equivalent inertia constant of the second mass (e.g. generator rotor) at rated speed (PC.A.5.4.2(b))</td>
<td>MW secs / MVA</td>
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<td>SPD+</td>
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<td>Equivalent shaft stiffness between the two masses (PC.A.5.4.2(b))</td>
<td>Nm / electrical radian</td>
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<td>-------------</td>
<td>-----------</td>
<td>------------------------------------------------------------</td>
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<tr>
<td>Minimum generator rotor speed (Doubly Fed Induction Generators) (PC.A.3.3.1(e))</td>
<td>RPM</td>
<td>□</td>
<td>■ SPD+</td>
<td>G1 G2 G3 G4 G5 G6 STN</td>
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<tr>
<td>Maximum generator rotor speed (Doubly Fed Induction Generators) (PC.A.3.3.1(a))</td>
<td>RPM</td>
<td>□</td>
<td>■ SPD+</td>
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<tr>
<td>The optimum generator rotor speed versus wind speed (PC.A.5.4.2(b))</td>
<td>tabular format</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Power Converter Rating (Doubly Fed Induction Generators) (PC.A.5.4.2(b))</td>
<td>MVA</td>
<td>□</td>
<td>■ DPD+</td>
<td></td>
</tr>
<tr>
<td>The rotor power coefficient ($C_p$) versus tip speed ratio ($\lambda$) curves for a range of blade angles (where applicable) (PC.A.5.4.2(b))</td>
<td>Diagram + tabular format</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>The electrical power output versus generator rotor speed for a range of wind speeds over the entire operating range of the Power Park Unit. (PC.A.5.4.2(b))</td>
<td>Diagram + tabular format</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>The blade angle versus wind speed curve (PC.A.5.4.2(b))</td>
<td>Diagram + tabular format</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>The electrical power output versus wind speed over the entire operating range of the Power Park Unit. (PC.A.5.4.2(b))</td>
<td>Diagram + tabular format</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Transfer function block diagram, parameters and description of the operation of the power electronic converter including fault ride though capability (where applicable). (PC.A.5.4.2(b))</td>
<td>Diagram</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>For a Power Park Unit consisting of a synchronous machine in combination with a back to back DC Converter, or for a Power Park Unit not driven by a wind turbine, the data to be supplied shall be agreed with NGET in accordance with PC.A.7. (PC.A.5.4.2(b))</td>
<td></td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
</tbody>
</table>
### DATA DESCRIPTION

<table>
<thead>
<tr>
<th>DATA to RTL</th>
<th>UNITS</th>
<th>DATA CAT.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>G1</td>
</tr>
</tbody>
</table>

#### Torque / Speed and blade angle control systems and parameters (PC.A.5.4.2(c))

For the **Power Park Unit**, 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.

- **Units**
- **Data to RTL**
- **Data Cat.**

#### Voltage/Reactive Power/Power Factor control system parameters (PC.A.5.4.2(d))

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

- **Units**
- **Data to RTL**
- **Data Cat.**

#### Frequency control system parameters (PC.A.5.4.2(e))

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.

- **Units**
- **Data to RTL**
- **Data Cat.**

#### 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. (PC.A.5.4.2(g))

- **Units**
- **Data to RTL**
- **Data Cat.**

#### Harmonic Assessment Information (PC.A.5.4.2(h))

- 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**

- **Units**
- **Data to RTL**
- **Data Cat.**
**DC CONVERTER STATION TECHNICAL DATA**

**DC CONVERTER STATION NAME**

<table>
<thead>
<tr>
<th>Data Description</th>
<th>Units</th>
<th>DATA to RTL</th>
<th>Data Category</th>
<th>DC Converter Station Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>(PC.A.4)</td>
<td></td>
<td>CUSC Contract</td>
<td>CUSC App. Form</td>
<td></td>
</tr>
</tbody>
</table>

**DC CONVERTER STATION DEMANDS:**

- **Demand** supplied through Station Transformers associated with the DC Converter Station
  - Demand with all DC Converters operating at Rated MW import.
  - Demand with all DC Converters operating at Rated MW export.

**Additional Demand** associated with the DC Converter Station supplied through the National Electricity Transmission System.

- The maximum Demand that could occur.
- Demand at specified time of annual peak half hour of NGET Demand at Annual ACS Conditions.
- Demand at specified time of annual minimum half-hour of NGET Demand.

**DC CONVERTER STATION DATA**

- Number of poles, i.e. number of DC Converters
  - Text

- Pole arrangement (e.g. monopole or bipole)
  - Text

- Details of each viable operating configuration
  - Configuration 1: Diagram
  - Configuration 2: Diagram
  - Configuration 3: Diagram
  - Configuration 4: Diagram
  - Configuration 5: Diagram
  - Configuration 6: Diagram

- Remote ac connection arrangement
  - Diagram
<table>
<thead>
<tr>
<th>Data Description</th>
<th>Units</th>
<th>DATA to RTL</th>
<th>Data Category</th>
<th>Operating Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>DC CONVERTER STATION DATA (PC.A.3.3.1d)</strong></td>
<td>Text</td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>DC Converter Type (e.g. current or Voltage source)</td>
<td>Text</td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>Point of connection to the <strong>NGET Transmission</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>System (or the <strong>Total System</strong> if embedded) of the DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Converter Station configuration in terms of</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>geographical and electrical location and system</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If the busbars at the <strong>Connection Point</strong> are</td>
<td>Section Number</td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>normally run in separate sections identify the</td>
<td></td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td>section to which the <strong>DC Converter Station</strong></td>
<td></td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>configuration is connected</td>
<td></td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td><strong>Rated MW import per pole [PC.A.3.3.1]</strong></td>
<td>MW</td>
<td>□</td>
<td>SPD+</td>
<td></td>
</tr>
<tr>
<td>** Rated MW export per pole [PC.A.3.3.1]**</td>
<td>MW</td>
<td>□</td>
<td>SPD+</td>
<td></td>
</tr>
<tr>
<td><strong>ACTIVE POWER TRANSFER CAPABILITY</strong></td>
<td>MW</td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>(PC.A.3.2.2)</td>
<td></td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registered Capacity</td>
<td>MW</td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>Registered Import Capacity</td>
<td>MW</td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>Minimum Generation</td>
<td>MW</td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>Minimum Import Capacity</td>
<td>MW</td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>Import MW available in excess of Registered Import</td>
<td>MW</td>
<td>□</td>
<td>SPD</td>
<td>Min</td>
</tr>
<tr>
<td>Capacity. Time duration for which MW in excess of</td>
<td></td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>Registered Import Capacity is available</td>
<td></td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>Export MW available in excess of Registered Capacity.</td>
<td>MW</td>
<td>□</td>
<td>SPD</td>
<td>Min</td>
</tr>
<tr>
<td>Time duration for which MW in excess of Registered</td>
<td></td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>Capacity is available</td>
<td></td>
<td>□</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td><strong>DC CONVERTER TRANSFORMER [PC.A.5.4.3.1]</strong></td>
<td>MVA</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Rated MVA</td>
<td></td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Winding arrangement</td>
<td></td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Nominal primary voltage</td>
<td>KV</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Nominal secondary (converter-side) voltage(s)</td>
<td>KV</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Positive sequence reactance</td>
<td></td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Maximum tap</td>
<td>% on MVA</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Nominal tap</td>
<td>% on MVA</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Minimum tap</td>
<td>% on MVA</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Positive sequence resistance</td>
<td></td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Maximum tap</td>
<td>% on MVA</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Nominal tap</td>
<td>% on MVA</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Minimum tap</td>
<td>% on MVA</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Zero phase sequence reactance</td>
<td></td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Tap change range</td>
<td>% / -%</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Number of steps</td>
<td></td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Data Description</td>
<td>Units</td>
<td>DATA to RTL</td>
<td>Data Category</td>
<td>Operating configuration</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>-------</td>
<td>-------------</td>
<td>---------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td><strong>DC NETWORK</strong> [PC.A.5.4.3.1 (c)]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated DC voltage per pole</td>
<td>KV</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Rated DC current per pole</td>
<td>A</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Details of the DC Network described in diagram form including resistance,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>inductance and capacitance of all DC cables and/or DC lines. Details of any</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>line reactors (including line reactor resistance), line capacitors, DC filters,</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>earthing electrodes and other conductors that form part of the DC Network</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>should be shown.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DC CONVERTER STATION</strong> AC HARMONIC FILTER AND REACTIVE COMPENSATION EQUIPMENT</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[PC.A.5.4.3.1 (d)]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For all switched reactive compensation equipment</td>
<td></td>
<td></td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>Total number of AC filter banks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagram of filter connections</td>
<td>Diagram □</td>
<td></td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>Type of equipment (e.g. fixed or variable)</td>
<td>Text  □</td>
<td></td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>Capacitive rating; or</td>
<td>Text  □</td>
<td></td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>Inductive rating; or</td>
<td>Mvar  □</td>
<td></td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>Operating range</td>
<td>Mvar  □</td>
<td></td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>Reactive Power capability as a function of various MW transfer levels</td>
<td>Table</td>
<td></td>
<td>DPD</td>
<td></td>
</tr>
</tbody>
</table>
## CONTROL SYSTEMS [PC.A.5.4.3.2]

<table>
<thead>
<tr>
<th>Data Description</th>
<th>Units</th>
<th>CUSC Control</th>
<th>CUSC App. Form</th>
<th>Operating configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Static $V_{DC} - P_{DC}$ (DC voltage – DC power) or Static $V_{DC} - I_{DC}$ (DC voltage – DC current) characteristic (as appropriate) when operating as Rectifier or Inverter</td>
<td>Diagram</td>
<td>□</td>
<td>DPD</td>
<td>1 2 3 4 5 6</td>
</tr>
<tr>
<td>Details of rectifier mode control system, in block diagram form together with parameters showing transfer functions of individual elements.</td>
<td></td>
<td></td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Details of inverter mode control system, in block diagram form showing transfer functions of individual elements including parameters.</td>
<td></td>
<td></td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Details of converter transformer tap changer control system in block diagram form showing transfer functions of individual elements including parameters. (Only required for DC converters connected to the National Electricity Transmission System.)</td>
<td></td>
<td></td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Details of AC filter and reactive compensation equipment control systems in block diagram form showing transfer functions of individual elements including parameters. (Only required for DC converters connected to the National Electricity Transmission System.)</td>
<td></td>
<td></td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Details of any frequency and/or load control systems in block diagram form showing transfer functions of individual elements including parameters.</td>
<td></td>
<td></td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Details of any large or small signal modulating 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.</td>
<td></td>
<td></td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Transfer block diagram representation of the reactive power control at converter ends for a voltage source converter.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## LOADING PARAMETERS [PC.A.5.4.3.3]

<table>
<thead>
<tr>
<th>Data Description</th>
<th>Units</th>
<th>CUSC Control</th>
<th>CUSC App. Form</th>
<th>Operating configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW Export Nominal loading rate</td>
<td>MW/s</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum (emergency) loading rate</td>
<td>MW/s</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MW Import Nominal loading rate</td>
<td>MW/s</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum (emergency) loading rate</td>
<td>MW/s</td>
<td>DPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum recovery time, to 90% of pre-fault loading, following an AC system fault or severe voltage depression.</td>
<td>s</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Maximum recovery time, to 90% of pre-fault loading, following a transient DC Network fault.</td>
<td>s</td>
<td>□</td>
<td>DPD</td>
<td></td>
</tr>
</tbody>
</table>

**NOTE:**
Users are referred to Schedules 5 & 14 which set down data required for all Users directly connected to the National Electricity Transmission System, including Power Stations.
**GENERATION PLANNING PARAMETERS**

This schedule contains the Genset Generation Planning Parameters required by NGET to facilitate studies in Operational Planning timescales.

For a Generating Unit (other than a Power Park Unit) at a Large Power Station the information is to be submitted on a unit basis and for a CCGT Module or Power Park Module at a Large Power Station the information is to be submitted on a module basis, unless otherwise stated.

Where references to CCGT Modules or Power Park Modules at a Large Power Station are made, the columns "G1" etc should be amended to read "M1" etc, as appropriate.

**Generation Station:** _________________________

**Generation Planning Parameters**

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA to RTL</th>
<th>DATA CAT.</th>
<th>GENSET OR STATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OUTPUT CAPABILITY</strong> (PC.A.3.2.2)**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registered Capacity on a station and unit basis (on a station and module basis</td>
<td>MW</td>
<td></td>
<td>SPD</td>
<td>G1 G2 G3 G4 G5 G6</td>
</tr>
<tr>
<td>in the case of a CCGT Module or Power Park Module at a Large Power Station)</td>
<td></td>
<td></td>
<td></td>
<td>STN</td>
</tr>
<tr>
<td>Minimum Generation on a module basis in the case of a CCGT Module or Power Park</td>
<td>MW</td>
<td></td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>Module at a Large Power Station)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MW available from Generating Units or Power Park Modules in excess of Registered</td>
<td>MW</td>
<td></td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>Capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>REGIME UNAVAILABILITY</strong></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>These data blocks are provided to allow fixed periods of unavailability to be</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>registered.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected Running Regime. Is Power Station normally available for full output 24</td>
<td></td>
<td></td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td>hours per day, 7 days per week? If No please provide details of unavailability</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>below.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(PC.A.3.2.2.)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Earliest Synchronising time: OC2.4.2.1(a)</td>
<td></td>
<td></td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Monday</td>
<td>hr/min</td>
<td></td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Tuesday – Friday</td>
<td>hr/min</td>
<td></td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Saturday – Sunday</td>
<td>hr/min</td>
<td></td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Latest De-Synchronising time: OC2.4.2.1(a)</td>
<td></td>
<td></td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Monday – Thursday</td>
<td>hr/min</td>
<td></td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td>hr/min</td>
<td></td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Saturday – Sunday</td>
<td>hr/min</td>
<td></td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td><strong>SYNCHRONISING PARAMETERS</strong></td>
<td></td>
<td></td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>OC2.4.2.1(a)</td>
<td></td>
<td></td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Notice to Deviate from Zero (NDZ) after 48 hour Shutdown</td>
<td>Mins</td>
<td></td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Station Synchronising Intervals (SI) after 48 hour Shutdown</td>
<td>Mins</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Synchronising Group (if applicable)</td>
<td>1 to 4</td>
<td></td>
<td>OC2</td>
<td></td>
</tr>
</tbody>
</table>
### SCHEDULE 2

#### DATA DESCRIPTION

<table>
<thead>
<tr>
<th>DATA to RTL</th>
<th>UNITS</th>
<th>DATA CAT.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### GENSET OR STATION DATA

<table>
<thead>
<tr>
<th>G1</th>
<th>G2</th>
<th>G3</th>
<th>G4</th>
<th>G5</th>
<th>G6</th>
<th>STN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DATA DESCRIPTION

<table>
<thead>
<tr>
<th>Synchronising Generation (SYG) after 48 hour Shutdown</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC.A.5.3.2(f) &amp; OC2.4.2.1(a)</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>De-Synchronising Intervals (Single value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC2.4.2.1(a)</td>
</tr>
</tbody>
</table>

### RUNNING AND SHUTDOWN PERIOD LIMITATIONS:

<table>
<thead>
<tr>
<th>Minimum Non Zero time (MNZT) after 48 hour Shutdown OC2.4.2.1(a)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Zero time (MZT) OC2.4.2.1(a)</td>
</tr>
<tr>
<td>Two Shifting Limit (max. per day) OC2.4.2.1(a)</td>
</tr>
<tr>
<td>Existing AGR Plant Flexibility Limit (Existing AGR Plant only)</td>
</tr>
<tr>
<td>80% Reactor Thermal Power (expressed as Gross-Net MW) (Existing AGR Plant only)</td>
</tr>
<tr>
<td>Frequency Sensitive AGR Unit Limit (Frequency Sensitive AGR Units only)</td>
</tr>
</tbody>
</table>

### RUN-UP PARAMETERS

<table>
<thead>
<tr>
<th>Run-up rates (RUR) after 48 hour Shutdown:</th>
</tr>
</thead>
<tbody>
<tr>
<td>(See note 2 page 3)</td>
</tr>
<tr>
<td>MW Level 1 (MWL1) MW</td>
</tr>
<tr>
<td>MW Level 2 (MWL2) MW</td>
</tr>
<tr>
<td>RUR from Synch. Gen to MWL1 MW/Mins</td>
</tr>
<tr>
<td>RUR from MWL1 to MWL2 MW/Mins</td>
</tr>
<tr>
<td>RUR from MWL2 to RC MW/Mins</td>
</tr>
<tr>
<td>Run-Down Rates (RDR):</td>
</tr>
<tr>
<td>(Note that for DPD only a single value of run-down rate from Registered Capacity to de-synch is required)</td>
</tr>
<tr>
<td>MWL2 MW</td>
</tr>
<tr>
<td>RDR from RC to MWL2 MW/Mins</td>
</tr>
<tr>
<td>MWL1 MW</td>
</tr>
<tr>
<td>RDR from MWL2 to MWL1 MW/Mins</td>
</tr>
<tr>
<td>RDR from MWL1 to de-synch MW/Mins</td>
</tr>
</tbody>
</table>

### UNITS

- MW
- Mins
- OC2
- DPD
- &
### DATA DESCRIPTION

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA to RTL</th>
<th>DATA CAT.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REGULATION PARAMETERS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OC2.4.2.1(a) Regulating Range</td>
<td>MW</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>Load rejection capability while still</td>
<td>MW</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>Synchronised and able to supply Load.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>GAS TURBINE LOADING PARAMETERS:</strong></td>
<td></td>
<td></td>
<td>OC2</td>
</tr>
<tr>
<td>OC2.4.2.1(a)</td>
<td></td>
<td></td>
<td>OC2</td>
</tr>
<tr>
<td>Fast loading</td>
<td>MW/Min</td>
<td></td>
<td>OC2</td>
</tr>
<tr>
<td>Slow loading</td>
<td>MW/Min</td>
<td></td>
<td>OC2</td>
</tr>
<tr>
<td><strong>CCGT MODULE PLANNING MATRIX</strong></td>
<td>OC2</td>
<td>(please attach)</td>
<td></td>
</tr>
<tr>
<td><strong>POWER PARK MODULE PLANNING MATRIX</strong></td>
<td>OC2</td>
<td>(please attach)</td>
<td></td>
</tr>
<tr>
<td>Power Park Module Active Power Output/</td>
<td>OC2</td>
<td>(please attach)</td>
<td></td>
</tr>
<tr>
<td>Intermittent Power Source Curve</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(eg MW output / Wind speed)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NOTES:

1. To allow for different groups of **Gensets** within a **Power Station** (eg. **Gensets** with the same operator) each **Genset** may be allocated to one of up to four **Synchronising Groups**. Within each such **Synchronising Group** the single synchronising interval will apply but between **Synchronising Groups** a zero synchronising interval will be assumed.

2. The run-up of a **Genset** from synchronising block load to **Registered Capacity** is represented as a three stage characteristic in which the run-up rate changes at two intermediate loads, MWL1 and MWL2. The values MWL1 & MWL2 can be different for each **Genset**.
LARGE POWER STATION OUTAGE PROGRAMMES, OUTPUT USABLE AND INFLEXIBILITY
INFORMATION

(Also outline information on contracts involving External Interconnections)

For a Generating Unit at a Large Power Station the information is to be submitted on a unit basis and for a CCGT Module or Power Park Module at a Large Power Station the information is to be submitted on a module basis, unless otherwise stated

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>TIME COVERED</th>
<th>UPDATE TIME</th>
<th>DATA CAT.</th>
<th>DATA to RTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Station name:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Generating Unit (or CCGT Module or Power Park Module at a Large Power Station) number:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registered Capacity:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Large Power Station OUTAGE PROGRAMME | Large Power Station OUTPUT USABLE |

PLANNING FOR YEARS 3 - 7 AHEAD (OC2.4.1.2.1(a)(i), (e) & (j))

<table>
<thead>
<tr>
<th>Monthly average OU MW</th>
<th>F. yrs 5 - 7</th>
<th>Week 24</th>
<th>SPD</th>
</tr>
</thead>
</table>

Provisional outage programme comprising:

- duration
- preferred start
- earliest start
- latest finish

Weekly OU MW

(NGET response as detailed in OC2 C. yrs 3 - 5 Week12)

(Users' response to NGET suggested changes or potential outages) C. yrs 3 - 5 Week14)

Updated provisional outage programme comprising:

- duration
- preferred start
- earliest start
- latest finish

Updated weekly OU MW

(NGET response as detailed in OC2 for C. yrs 3 - 5 Week28)

(Users' response to NGET suggested changes or update of potential outages) C. yrs 3 - 5 Week31)

Agreement of final Generation Outage Programme C. yrs 3 - 5 Week 45

PLANNING FOR YEARS 1 - 2 AHEAD (OC2.4.1.2.2(a) & OC2.4.1.2.2(i))

Update of previously agreed Final Generation Outage Programme C. yrs 1 - 2 Week 10

Weekly OU MW
<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>TIME COVERED</th>
<th>UPDATE TIME</th>
<th>DATA CAT</th>
<th>DATA to</th>
</tr>
</thead>
<tbody>
<tr>
<td>(NGET response as detailed in OC2 for</td>
<td></td>
<td>C. yrs 1 – 2</td>
<td>Week 12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Users' response to NGET suggested changes</td>
<td></td>
<td>C. yrs 1 – 2</td>
<td>Week 14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or update of potential outages)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revised weekly OU</td>
<td></td>
<td>C. yrs 1 – 2</td>
<td>Week 34</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>(NGET response as detailed in OC2 for</td>
<td></td>
<td>C. yrs 1 – 2</td>
<td>Week 39)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Users' response to NGET suggested changes</td>
<td></td>
<td>C. yrs 1 – 2</td>
<td>Week 46)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>or update of potential outages)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agreement of final Generation Outage Programme</td>
<td></td>
<td>C. yrs 1 – 2</td>
<td>Week 48</td>
<td>OC2</td>
<td></td>
</tr>
</tbody>
</table>

**PLANNING FOR YEAR 0**

Updated Final Generation Outage Programme

<table>
<thead>
<tr>
<th>OU at weekly peak MW</th>
<th>C. yr 0 Week 2 ahead to year end Weds.</th>
<th>1600</th>
<th>OC2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(NGET response as detailed in OC2 for</td>
<td>C. yrs 0</td>
<td>1600</td>
<td></td>
</tr>
<tr>
<td>(</td>
<td>(Weeks 2 to 52 ahead)</td>
<td>Friday</td>
<td></td>
</tr>
<tr>
<td>(NGET response as detailed in OC2 for</td>
<td></td>
<td>1600</td>
<td></td>
</tr>
<tr>
<td>(</td>
<td>(Weeks 2 - 7 ahead)</td>
<td>Thurs</td>
<td></td>
</tr>
<tr>
<td>Forecast return to services (Planned Outage or breakdown)</td>
<td>date</td>
<td>days 2 to 14 ahead</td>
<td>0900</td>
</tr>
<tr>
<td>OU (all hours) MW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(NGET response as detailed in OC2 for</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(</td>
<td>days 2 to 14 ahead</td>
<td>1600</td>
<td></td>
</tr>
</tbody>
</table>
| INFLEXIBILITY

Genset inflexibility Min MW (Weekly) Weeks 2 - 8 ahead 1600 Tues OC2

<table>
<thead>
<tr>
<th>(NGET response on Negative Reserve Active (Power Margin)</th>
<th>Weeks 2 - 8 ahead</th>
<th>1200</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Power Margin)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Genset inflexibility Min MW (daily)</td>
<td>days 2 -14 ahead</td>
<td>0900</td>
</tr>
<tr>
<td>(NGET response on Negative Reserve Active (Power Margin)</td>
<td>days 2 -14 ahead</td>
<td>1600</td>
</tr>
<tr>
<td>(Power Margin)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATA DESCRIPTION</td>
<td>UNITS</td>
<td>TIME COVERED</td>
</tr>
<tr>
<td>------------------</td>
<td>-------</td>
<td>--------------</td>
</tr>
</tbody>
</table>

**OUTPUT PROFILES**

In the case of **Large Power Stations** whose output may be expected to vary in a random manner (eg. wind power) or to some other pattern (eg. Tidal) sufficient information is required to enable an understanding of the possible profile

| MW | F. yrs 1 - 7 | Week 24 | SPD |

**Notes:** 1. The week numbers quoted in the Update Time column refer to standard weeks in the current year.
GOVERNOR DROOP AND RESPONSE (PC.A.5.5 ■ CUSC Contract)

The Data in this Schedule 4 is to be supplied by Generators with respect to all Large Power Stations and by DC Convertor Station owners (where agreed), whether directly connected or Embedded.

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>NORMAL VALUE</th>
<th>MW</th>
<th>DATA CAT</th>
<th>DROOP%</th>
<th>RESPONSE CAPABILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Unit 1</td>
<td>Unit 2</td>
<td>Unit 3</td>
</tr>
<tr>
<td>MLP1</td>
<td>Designed Minimum Operating Level (for a CCGT Module or Power Park Module, on a modular basis assuming all units are Synchronised)</td>
<td></td>
<td></td>
<td></td>
<td>Primary</td>
</tr>
<tr>
<td>MLP2</td>
<td>Minimum Generation (for a CCGT Module or Power Park Module, on a modular basis assuming all units are</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MLP3</td>
<td>70% of Registered Capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MLP4</td>
<td>80% of Registered Capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MLP5</td>
<td>95% of Registered Capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MLP6</td>
<td>Registered Capacity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. The data provided in this Schedule 4 is not intended to constrain any Ancillary Services Agreement.
2. Registered Capacity should be identical to that provided in Schedule 2.
3. The Governor Droop should be provided for each Generating Unit (excluding Power Park Units), Power Park Module or DC Converter. The Response Capability should be provided for each Genset or DC Converter.
4. Primary, Secondary and High Frequency Response are defined in CC.A.3.2 and are based on a frequency ramp of 0.5Hz over 10 seconds. Primary Response is the minimum value of response between 10s and 30s after the frequency ramp starts, Secondary Response between 30s and 30 minutes, and High Frequency Response is the minimum value after 10s on an indefinite basis.
5. For plants which have not yet Synchronised, the data values of MLP1 to MLP6 should be as described above. For plants which have already Synchronised, the values of MLP1 to MLP6 can take any value between Designed Operating Minimum Level and Registered Capacity. If MLP1 is not provided at the Designed Minimum Operating Level, the value of the Designed Minimum Operating Level should be separately stated.
The data in this Schedule 5 is required from Users who are connected to the National Electricity Transmission System via a Connection Point (or who are seeking such a connection)

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA to RTL</th>
<th>DATA CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>USERS SYSTEM LAYOUT (PC.A.2.2)</td>
<td></td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>A Single Line Diagram showing all or part of the User’s System is required. This diagram shall include:-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) all parts of the User’s System, whether existing or proposed, operating at Supergrid Voltage, and in Scotland and Offshore, also all parts of the User System operating at 132kV,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(b) all parts of the User’s System operating at a voltage of 50kV, and in Scotland and Offshore greater than 30kV, or higher which can interconnect Connection Points, or split bus-bars at a single Connection Point,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(c) all parts of the User’s System between Embedded Medium Power Stations or Large Power Stations or Offshore Transmission Systems connected to the User’s Subtransmission System and the relevant Connection Point or Interface Point,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d) all parts of the User’s System at a Transmission Site.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The Single Line Diagram may also include additional details of the User’s Subtransmission System, and the transformers connecting the User’s Subtransmission System to a lower voltage. With NGET’s agreement, it may also include details of the User’s System at a voltage below the voltage of the Subtransmission System.

This Single Line Diagram shall depict the arrangement(s) of all of the existing and proposed load current carrying Apparatus relating to both existing and proposed Connection Points, showing electrical circuitry (ie. overhead lines, underground cables, power transformers and similar equipment), operating voltages. In addition, for equipment operating at a Supergrid Voltage, and in Scotland and Offshore also at 132kV, circuit breakers and phasing arrangements shall be shown.
## USERS SYSTEM DATA

### REACTIVE COMPENSATION (PC.A.2.4)

For independently switched reactive compensation equipment not owned by a **Transmission Licensee** connected to the **User's System** at 132kV and above, and also in Scotland and **Offshore**, connected at 33kV and above, other than power factor correction equipment associated with a customer's **Plant** or **Apparatus**:

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA EXCH</th>
<th>DATA CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of equipment (eg. fixed or variable)</td>
<td>Text</td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>Capacitive rating; or</td>
<td>Mvar</td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>Inductive rating; or</td>
<td>Mvar</td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>Operating range</td>
<td>Mvar</td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>Details of automatic control logic to enable operating characteristics to be determined</td>
<td>Text and/or diagrams</td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>Point of connection to <strong>User's System</strong> (electrical location and system voltage)</td>
<td>Text</td>
<td></td>
<td>SPD</td>
</tr>
</tbody>
</table>

### SUBSTATION INFRASTRUCTURE (PC.A.2.6(b))

For the infrastructure associated with any **User's** equipment at a Substation owned by a **Transmission Licensee** or operated or managed by **NGET**:-

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA EXCH</th>
<th>DATA CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated 3-phase rms short-circuit withstand current</td>
<td>kA</td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>Rated 1-phase rms short-circuit withstand current</td>
<td>kA</td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>Rated Duration of short-circuit withstand</td>
<td>s</td>
<td></td>
<td>SPD</td>
</tr>
<tr>
<td>Rated rms continuous current</td>
<td>A</td>
<td></td>
<td>SPD</td>
</tr>
</tbody>
</table>

### LUMPED SUSCEPTANCES (PC.A.2.3)

Equivalent Lumped Susceptance required for all parts of the User’s Subtransmission System which are not included in the Single Line Diagram.

This should not include:

(a) independently switched reactive compensation equipment identified above.

(b) any susceptance of the **User’s System** inherent in the **Demand (Reactive Power)** data provided in Schedule 1 (Generator Data) or Schedule 11 (Connection Point data).

Equivalent lumped shunt susceptance at nominal **Frequency**. % on 100 MVA | SPD |
**USER’S SYSTEM DATA**

**Circuit Parameters** *(PC.A.2.2.4) (n CUSC Contract & n CUSC Application Form)*

The data below is all **Standard Planning Data**. Details are to be given for all circuits shown on the **Single Line Diagram**

<table>
<thead>
<tr>
<th>Years Valid</th>
<th>Node 1</th>
<th>Node 2</th>
<th>Rated Voltage Kv</th>
<th>Operating Voltage Kv</th>
<th>Positive Phase Sequence % on 100 MVA</th>
<th>Zero Phase Sequence (self) % on 100 MVA</th>
<th>Zero Phase Sequence (mutual) % on 100 MVA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R</td>
<td>X</td>
<td>B</td>
<td></td>
<td>R</td>
<td>X</td>
<td>B</td>
</tr>
</tbody>
</table>

**Notes**

1. Data should be supplied for the current, and each of the seven succeeding Financial Years. This should be done by showing for which years the data is valid in the first column of the Table.
### USERS SYSTEM DATA

Transformer Data (PC.A.2.2.5) (• CUSC Contract & • CUSC Application Form)

The data below is all **Standard Planning Data**, and details should be shown below of all transformers shown on the **Single Line Diagram**. Details of Winding Arrangement, Tap Changer and earthing details are only required for transformers connecting the User's higher voltage system with its **Primary Voltage System**.

<table>
<thead>
<tr>
<th>Years valid</th>
<th>Name of Node or Connection Point</th>
<th>Transformer</th>
<th>Rating MVA</th>
<th>Voltage Ratio</th>
<th>Positive Phase Sequence Reactance % on Rating</th>
<th>Positive Phase Sequence Resistance % on Rating</th>
<th>Zero Sequence Reactance % on Rating</th>
<th>Winding Arr.</th>
<th>Tap Changer</th>
<th>Earthing Details (delete as app.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>HV Max. Tap</td>
<td>LV Min. Tap</td>
<td>Nom. Tap</td>
<td>Max. Tap</td>
<td>Min. Tap</td>
<td>Nom. Tap</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>

*If Resistance or Reactance please give impedance value

**Notes**

1. Data should be supplied for the current, and each of the seven succeeding Financial Years. This should be done by showing for which years the data is valid in the first column of the Table.
2. For a transformer with two secondary windings, the positive and zero phase sequence leakage impedances between the HV and LV1, HV and LV2, and LV1 and LV2 windings are required.
## USER’S SYSTEM DATA

**Switchgear Data (PC.A.2.2.6(a))** *(CUSC Contract & CUSC Application Form)*

The data below is all **Standard Planning Data**, and should be provided for all switchgear (ie. circuit breakers, load disconnectors and disconnectors) operating at a **Supergrid Voltage**, and also in Scotland and **Offshore**, operating at 132kV. In addition, data should be provided for all circuit breakers irrespective of voltage located at a **Connection Site** which is owned by a **Transmission Licensee** or operated or managed by **NGET**.

<table>
<thead>
<tr>
<th>Years Valid</th>
<th>Connection Point</th>
<th>Switch No.</th>
<th>Rated Voltage kV rms</th>
<th>Operating Voltage kV rms</th>
<th>Rated short-circuit breaking current</th>
<th>Rated short-circuit peak making current</th>
<th>Rated rms continuous current (A)</th>
<th>DC time constant at testing of asymmetrical breaking ability(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3 Phase kA rms</td>
<td>1 Phase kA rms</td>
<td>3 Phase kA peak</td>
<td>1 Phase kA peak</td>
</tr>
</tbody>
</table>

### Notes

1. Rated Voltage should be as defined by IEC 694.
2. Data should be supplied for the current, and each of the seven succeeding Financial Years. This should be done by showing for which years the data is valid in the first column of the Table.
# USERS SYSTEM DATA

## PROTECTION SYSTEMS (PC.A.6.3)

The following information relates only to Protection equipment which can trip or inter-trip or close any Connection Point circuit breaker or any National Electricity Transmission System circuit breaker. The 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 thereafter, although NGET should be notified if any of the information changes.

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA to RTL</th>
<th>DATA CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) A full description, including estimated settings, for all relays and Protection systems installed or to be installed on the User's System;</td>
<td>▬</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(b) A full description of any auto-reclose facilities installed or to be installed on the User's System, including type and time delays;</td>
<td>▬</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(c) A full description, including estimated settings, for all relays and Protection systems installed or to be installed on the Power Park Module or Generating Unit's generator transformer, unit transformer, station transformer and their associated connections;</td>
<td>▬</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(d) For Generating Units (other than Power Park Units) having a circuit breaker at the generator terminal voltage clearance times for electrical faults within the Generating Unit zone must be declared.</td>
<td>▬</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(e) Fault Clearance Times: Most probable fault clearance time for electrical faults on any part of the Users System directly connected to the National Electricity Transmission System.</td>
<td>mSec</td>
<td>▬</td>
<td>DPD</td>
</tr>
</tbody>
</table>

## POWER PARK MODULE/UNIT PROTECTION SYSTEMS

Details of settings for the Power Park Module/Unit protection relays (to include): (PC.A.5.4.2(f))

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA to RTL</th>
<th>DATA CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Under frequency,</td>
<td>▬</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(b) Over Frequency,</td>
<td>▬</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(c) Under Voltage, Over Voltage,</td>
<td>▬</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(d) Rotor Over current</td>
<td>▬</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(e) Stator Over current,..</td>
<td>▬</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(f) High Wind Speed Shut Down Level</td>
<td>▬</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(g) Rotor Underspeed</td>
<td>▬</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(h) Rotor Overspeed</td>
<td>▬</td>
<td>DPD</td>
<td></td>
</tr>
</tbody>
</table>
USER’S SYSTEM DATA

Information for Transient Overvoltage Assessment (DPD) (PC.A.6.2 ■ CUSC Contract)

The information listed below may be requested by NGET from each User with respect to any Connection Site between that User and the National Electricity Transmission System. The impact of any third party Embedded within the Users System should be reflected.

(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 without intermediate transformation;

(f) The following data is required on all transformers operating at Supergrid Voltage and also in Scotland and Offshore, operating at 132kV: 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.

Harmonic Studies (DPD) (PC.A.6.4 ■ CUSC Contract)

The information given below, both current and forecast, where not already supplied in this Schedule 5 may be requested by NGET from each User if it is necessary for NGET to evaluate the production/magnification of harmonic distortion on National Electricity Transmission System and User’s systems. The impact of any third party Embedded within the User’s System should be reflected:-

(a) 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

(b) for all transformers connecting the User’s Subtransmission System to a lower voltage:-

Rated MVA
Voltage Ratio
Positive phase sequence resistance
Positive phase sequence reactance

(c) 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
Details of traction loads, eg connection phase pairs, continuous variation with time, etc.

(d) an indication of which items of equipment may be out of service simultaneously during Planned Outage conditions

Voltage Assessment Studies (DPD) (PC.A.6.5 ■ CUSC Contract)

The information listed below, where not already supplied in this Schedule 5, may be requested by NGET from each User with respect to any Connection Site if it is necessary for NGET to undertake detailed voltage assessment studies (eg to examine potential voltage instability, voltage control co-ordination or to calculate voltage step changes). The impact of any third party Embedded within the Users System should be reflected:-

(a) For all circuits of the User’s Subtransmission System:-

Positive Phase Sequence Reactance
Positive Phase Sequence Resistance
Positive Phase Sequence Susceptance
Mvar rating of any reactive compensation equipment

(b) for all transformers connecting the User’s Subtransmission System to a lower voltage:-

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

(c) at the lower voltage points of those connecting transformers:-

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

Short Circuit Analyses (DPD) (PC.A.6.6 ■ CUSC Contract)

The information listed below, both current and forecast, and where not already supplied under this Schedule 5, may be requested by NGET from each User with respect to any Connection Site where prospective short-circuit currents on equipment owned by a Transmission Licensee or operated or managed by NGET are close to the equipment rating. The impact of any third party Embedded within the User’s System should be reflected:-

(a) For all circuits of the User’s Subtransmission System:-

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)
(b) for all transformers connecting the User's Subtransmission System to a lower voltage:

- 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

(c) at the lower voltage points of those connecting transformers:

The maximum Demand (in MW and Mvar) that could occur
Short-circuit infeed data in accordance with PC.A.2.5.6(a) unless the User's lower voltage network runs in parallel with the Subtransmission System, when to prevent double counting in each node infeed data, a π equivalent comprising the data items of PC.A.2.5.6(a) for each node together with the positive phase sequence interconnection impedance between the nodes shall be submitted,
**DATA DESCRIPTION** | **UNITS** | **DATA to RTL** | **TIMESCALE COVERED** | **UPDATE TIME** | **DATA CAT.**
--- | --- | --- | --- | --- | ---
Details are required from Network Operators of proposed outages in their User Systems and from Generators with respect to their outages, which may affect the performance of the Total System (eg. at a Connection Point or constraining Embedded Large Power Stations or constraints to the Maximum Import Capacity or Maximum Export Capacity at an Interface Point) (OC2.4.1.3.2(a) & (b))

(NGET advises Network Operators of National Electricity Transmission System outages (affecting their Systems))

Network Operator informs NGET if unhappy with proposed outages)

(NGET draws up revised National Electricity Transmission System (outage plan advises Users of operational effects)

Generators and Non-Embedded Customers provide Details of Apparatus owned by them (other than Gensets) at each Grid Supply Point (OC2.4.1.3.3)

(NGET advises Network Operators of outages affecting their Systems (OC2.4.1.3.3)

Network Operator details of relevant outages affecting the Total System (OC2.4.1.3.3)

Details of:- Maximum Import Capacity for each Interface Point Maximum Export Capacity for each Interface Point Changes to previously declared values of the Interface Point Target Voltage/Power Factor (OC2.4.1.3.3(c)).

(NGET informs Users of aspects that may affect their Systems (OC2.4.1.3.3)

Users inform NGET if unhappy with aspects as notified (OC2.4.1.3.3)

(NGET issues final National Electricity Transmission System (outage plan with advice of operational) (OC2.4.1.3.3) (effects on Users System)

Generator, Network Operator and Non-Embedded Customers to inform NGET of changes to outages previously requested

Details of load transfer capability of 12MW or more between Grid Supply Points in England and Wales and 10MW or more between Grid Supply Points in Scotland.
<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Details of:-</td>
</tr>
<tr>
<td>Maximum Import Capacity for each Interface Point</td>
</tr>
<tr>
<td>Maximum Export Capacity for each Interface Point</td>
</tr>
<tr>
<td>Changes to previously declared values of the Interface Point Target Voltage/Power Factor</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>UNITS</th>
<th>DATA to RTL</th>
<th>TIMESCALE COVERED</th>
<th>UPDATE TIME</th>
<th>DATA CAT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVA / MW</td>
<td></td>
<td>Within Yr 0</td>
<td>As occurring</td>
<td>OC2</td>
</tr>
<tr>
<td>MVA / MW</td>
<td></td>
<td></td>
<td></td>
<td>OC2</td>
</tr>
<tr>
<td>V (unless power factor control)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Users should refer to OC2 for full details of the procedure summarised above and for the information which NGET will provide on the Programming Phase.
LOAD CHARACTERISTICS AT GRID SUPPLY POINTS

All data in this schedule 7 is categorised as **Standard Planning Data (SPD)** and is required for existing and agreed future connections. This data is only required to be updated when requested by **NGET**.

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA FOR FUTURE YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FOR ALL TYPES OF DEMAND FOR EACH GRID SUPPLY POINT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The following information is required infrequently and should only be supplied, wherever possible, when requested by <strong>NGET (PC.A.4.7)</strong></td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Details of individual loads which have Characteristics significantly different from the typical range of domestic or commercial and industrial load supplied: <strong>(PC.A.4.7(a))</strong></td>
<td>□</td>
<td>(Please Attach)</td>
</tr>
<tr>
<td>Sensitivity of demand to fluctuations in voltage And frequency on <strong>National Electricity Transmission System</strong> at time of peak <strong>Connection Point Demand (Active Power)</strong> <strong>(PC.A.4.7(b))</strong></td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Voltage Sensitivity <strong>(PC.A.4.7(b))</strong></td>
<td>MW/kV □</td>
<td></td>
</tr>
<tr>
<td>Mvar/kV □</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency Sensitivity <strong>(PC.A.4.7(b))</strong></td>
<td>MW/Hz □</td>
<td></td>
</tr>
<tr>
<td>Mvar/Hz □</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Reactive Power</strong> sensitivity should relate to the Power Factor information given in Schedule 11 (or for <strong>Generators</strong>, Schedule 1) and note 6 on Schedule 11 relating to <strong>Reactive Power</strong> therefore applies: <strong>(PC.A.4.7(b))</strong></td>
<td>□</td>
<td></td>
</tr>
<tr>
<td>Phase unbalance imposed on the <strong>National Electricity Transmission System</strong> <strong>(PC.A.4.7(d))</strong></td>
<td>% □</td>
<td></td>
</tr>
<tr>
<td>- maximum</td>
<td>% □</td>
<td></td>
</tr>
<tr>
<td>- average</td>
<td>% □</td>
<td></td>
</tr>
<tr>
<td>Maximum Harmonic Content imposed on <strong>National Electricity Transmission System</strong> <strong>(PC.A.4.7(e))</strong></td>
<td>% □</td>
<td></td>
</tr>
<tr>
<td>Details of any loads which may cause Demand Fluctuations greater than those permitted under Engineering Recommendation P28, Stage 1 at the <strong>Point of Common Coupling</strong> including <strong>Flicker Severity (Short Term)</strong> and <strong>Flicker Severity (Long Term)</strong> <strong>(PC.A.4.7(f))</strong></td>
<td>□</td>
<td></td>
</tr>
</tbody>
</table>
DATA SUPPLIED BY BM PARTICIPANTS

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC1</td>
<td>Physical Notifications</td>
</tr>
<tr>
<td>BC1</td>
<td>Quiescent Physical Notifications</td>
</tr>
<tr>
<td>BC1 &amp; BC2</td>
<td>Export and Import Limits</td>
</tr>
<tr>
<td>BC1</td>
<td>Bid-Offer Data</td>
</tr>
<tr>
<td>BC1</td>
<td>Dynamic Parameters (Day Ahead)</td>
</tr>
<tr>
<td>BC2</td>
<td>Dynamic Parameters (For use in Balancing Mechanism)</td>
</tr>
<tr>
<td>BC1 &amp; BC2</td>
<td>Other Relevant Data</td>
</tr>
<tr>
<td>BC1</td>
<td>Joint BM Unit Data</td>
</tr>
</tbody>
</table>

- No information collated under this Schedule will be transferred to the Relevant Transmission Licensees
DATA SUPPLIED BY NGET TO USERS

(Example of data to be supplied)

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CC</td>
<td>Operation Diagram</td>
</tr>
<tr>
<td>CC</td>
<td>Site Responsibility Schedules</td>
</tr>
<tr>
<td>PC</td>
<td>Day of the peak National Electricity Transmission System Demand</td>
</tr>
<tr>
<td></td>
<td>Day of the minimum National Electricity Transmission System Demand</td>
</tr>
<tr>
<td>OC2</td>
<td>Surpluses and OU requirements for each Generator over varying timescales</td>
</tr>
<tr>
<td></td>
<td>Equivalent networks to Users for Outage Planning</td>
</tr>
<tr>
<td></td>
<td>Negative Reserve Active Power Margins (when necessary)</td>
</tr>
<tr>
<td></td>
<td>Operating Reserve information</td>
</tr>
<tr>
<td>BC1</td>
<td>Demand Estimates, Indicated Margin and Indicated Imbalance, indicative Synchronising and Desynchronising times of Embedded Power Stations to Network Operators, special actions.</td>
</tr>
<tr>
<td>BC2</td>
<td>Bid-Offer Acceptances, Ancillary Services instructions to relevant Users, Emergency Instructions</td>
</tr>
<tr>
<td>BC3</td>
<td>Location, amount, and Low Frequency Relay settings of any Low Frequency Relay initiated Demand reduction for Demand which is Embedded.</td>
</tr>
</tbody>
</table>

- No information collated under this Schedule will be transferred to the Relevant Transmission Licensees

DATA TO BE SUPPLIED BY NGET TO USERS

PURSUANT TO THE TRANSMISSION LICENCE

1. The Transmission Licence requires NGET to publish annually the Seven Year Statement which is designed to provide Users and potential Users with information to enable them to identify opportunities for continued and further use of the National Electricity Transmission System.

When a User is considering a development at a specific site, certain additional information may be required in relation to that site which is of such a level of detail that it is inappropriate to include it in the Seven Year Statement. In these circumstances the User may contact NGET who will be pleased to arrange a discussion and the provision of such additional information relevant to the site under consideration as the User may reasonably require.

2. The Transmission Licence also requires NGET to offer terms for an agreement for connection to and use of the National Electricity Transmission System and further information will be given by NGET to the potential User in the course of the discussions of the terms of such an agreement.
DEMAND PROFILES AND ACTIVE ENERGY DATA

The following information is required from each Network Operator and from each Non-Embedded Customer. The data should be provided in calendar week 24 each year (although Network Operators may delay the submission until calendar week 28).

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>F. Yr. 0</th>
<th>F. Yr. 1</th>
<th>F. Yr. 2</th>
<th>F. Yr. 3</th>
<th>F. Yr. 4</th>
<th>F. Yr. 5</th>
<th>F. Yr. 6</th>
<th>F. Yr. 7</th>
<th>UPDATE TIME</th>
<th>DATA CAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand Profiles</td>
<td>(PC.A.4.2)</td>
<td>■ CUSC Contract &amp; ■ CUSC Application Form</td>
<td>Day of User’s annual Maximum demand at Annual ACS Conditions (MW)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Total User’s system profile (please delete as applicable)</td>
<td>Day of annual peak of National Electricity Transmission System Demand at Annual ACS Conditions (MW)</td>
<td></td>
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<tr>
<td></td>
<td>Day of annual minimum National Electricity Transmission System Demand at average conditions (MW)</td>
<td></td>
<td></td>
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<td>Wk.24</td>
<td>SPD</td>
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<td>0030 : 0100</td>
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### DATA DESCRIPTION

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<thead>
<tr>
<th>Out-turn</th>
<th>F.Yr. 0</th>
<th>Update Time</th>
<th>Data Cat</th>
<th>DATA to RTL</th>
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<tbody>
<tr>
<td>Actual Weath corr.</td>
<td>Week 24</td>
<td>SPD</td>
<td>CUSC Contract</td>
<td>CUSC App. Form</td>
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</tbody>
</table>

**Active Energy Data**

Total annual Active Energy requirements under average conditions of each Network Operator and each Non-Embedded Customer in the following categories of Customer Tariff:

- LV1
- LV2
- LV3
- EHV
- HV
- Traction
- Lighting
- User System Losses

**Active Energy from Embedded Small Power Stations and Embedded Medium Power Stations**

### NOTES:

1. ‘F. yr.’ means ‘Financial Year’

2. **Demand** and **Active Energy** Data (General)

   Demand and Active Energy data should relate to the point of connection to the National Electricity Transmission System and should be net of the output (as reasonably considered appropriate by the User) of all Embedded Small Power Stations, Medium Power Stations and Customer Generating Plant. Auxiliary demand of Embedded Power Stations should be included in the demand data submitted by the User at the Connection Point. Users should refer to the PC for a full definition of the Demand to be included.

3. **Demand** profiles and **Active Energy** data should be for the total System of the Network Operator, including all Connection Points, and for each Non-Embedded Customer. Demand Profiles should give the numerical maximum demand that in the User’s opinion could reasonably be imposed on the National Electricity Transmission System.

4. In addition the demand profile is to be supplied for such days as NGET may specify, but such a request is not to be made more than once per calendar year.
The following information is required from each Network Operator and from each Non-Embedded Customer. The data should be provided in calendar week 24 each year (although Network Operators may delay the submission until calendar week 28).

**Connection Point:**

<table>
<thead>
<tr>
<th>Connection Point Demand at the time of -</th>
<th>(select one in turn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Provide data for each Access Period associated with the Connection Point)</td>
<td></td>
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</tbody>
</table>

- a) maximum Demand
- b) peak National Electricity Transmission System Demand *(specified by NGET)*
- c) minimum National Electricity Transmission System Demand *(specified by NGET)*
- d) maximum Demand during Access Period
- e) specified by either NGET or a User

**Name of Transmission Interface Circuit out of service during Access Period (if reqd).**

**DATA DESCRIPTION** *(CUSC Contract □ & CUSC Application Form ■)*

<table>
<thead>
<tr>
<th>DATA CAT</th>
<th>Data Description</th>
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<tbody>
<tr>
<td>PC.A.4.1.4.2</td>
<td>Outturn Outturn F.Yr F.Yr F.Yr F.Yr F.Yr F.Yr F.Yr F.Yr</td>
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<tr>
<td></td>
<td>Weather Corrected 1 2 3 4 5 6 7 8</td>
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</table>

- Date of a), b), c), d) or e) as denoted above.
- Time of a), b), c), d) or e) as denoted above.
- Connection Point Demand (MW)
- Connection Point Demand (MVAr)
- Deduction made at Connection Point for Small Power Stations, Medium Power Stations and Customer Generating Plant (MW)
- Reference to valid Single Line Diagram
- Reference to node and branch data.

**Note:** The following data block can be repeated for each post fault network revision that may impact on the Transmission System.

**Access Group:**

<table>
<thead>
<tr>
<th>DATA CAT</th>
<th>Data Description</th>
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<tr>
<td>PC.A.4.3.1</td>
<td>Name of associated Connection Point within the same Access Group:</td>
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<tr>
<td>PC.A.4.3.1</td>
<td>Demand at associated Connection Point (MW)</td>
</tr>
<tr>
<td>PC.A.4.3.1</td>
<td>Demand at associated Connection Point (MVAr)</td>
</tr>
<tr>
<td>PC.A.4.3.2(a)</td>
<td>Deduction made at associated Connection Point for Small Power Stations, Medium Power Stations and Customer Generating Plant (MW)</td>
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</table>
### Embedded Generation Data

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<tr>
<th>Connection Point:</th>
<th>Outturn Weather Corrected</th>
<th>F.Yr.</th>
<th>F.Yr.</th>
<th>F.Yr.</th>
<th>F.Yr.</th>
<th>F.Yr.</th>
<th>F.Yr.</th>
<th>F.Yr.</th>
<th>Data Cat</th>
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</thead>
<tbody>
<tr>
<td><strong>Small Power Station, Medium Power Station and Customer Generation Summary</strong></td>
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<tr>
<td>No. of Small Power Stations, Medium Power Stations or Customer Power Stations</td>
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<td>PC.A.3.1.4(a)</td>
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<tr>
<td>Number of Generating Units within these stations</td>
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<td>PC.A.3.1.4(a)</td>
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<tr>
<td>Summated Capacity of all these Generating Units</td>
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<td>PC.A.3.1.4(a)</td>
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<tr>
<td>Where the Network Operator’s System places a constraint on the capacity of an Embedded Large Power Station</td>
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<tr>
<td>Station Name</td>
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<td>PC.A.3.2.2(c)</td>
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<td>Generating Unit</td>
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<td>PC.A.3.2.2(c)(i)</td>
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<tr>
<td>Reactive Despatch Network Restriction</td>
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<td>PC.A.3.2.2(c)(ii)</td>
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</table>

| Where the Network Operator’s System places a constraint on the capacity of an Offshore Transmission System at an Interface Point | |       |       |       |       |       |       |       | PC.A.3.2.2(c) |
| Offshore Transmission System Name | |       |       |       |       |       |       |       | |
| Interface Point Name | |       |       |       |       |       |       |       | PC.A.3.2.2(c) |
| Maximum Export Capacity | |       |       |       |       |       |       |       | PC.A.3.2.2(c) |
| Maximum Import Capacity | |       |       |       |       |       |       |       | PC.A.3.2.2(c) |

**NOTES:**

1. ‘F.Yr.’ means ‘Financial Year’. F.Yr. 1 refers to the current financial year.

2. All Demand data should be net of the output (as reasonably considered appropriate by the User) of all Embedded Small Power Stations, Medium Power Stations and Customer Generating Plant. Generation and / or Auxiliary demand of Embedded Large Power Stations should not be included in the demand data submitted by the User. Users should refer to the PC for a full definition of the Demand to be included.

3. Peak Demand should relate to each Connection Point individually and should give the maximum demand that in the User’s opinion could reasonably be imposed on the National Electricity Transmission System. Users my submit the Demand data at each node on the Single Line Diagram instead of at a Connection Point as long the user reasonably believe such data relates to the peak (or minimum) at the Connection Point.

In deriving Demand any deduction made by the User (as detailed in note 2 above) to allow for Embedded Small Power Stations, Medium Power Stations and Customer Generating Plant is to be specifically stated as indicated on the Schedule.
4. NGET may at its discretion require details of any Embedded Small Power Stations or Embedded Medium Power Stations whose output can be expected to vary in a random manner (eg. wind power) or according to some other pattern (eg. tidal power)

5. Where more than 95% of the total Demand at a Connection Point is taken by synchronous motors, values of the Power Factor at maximum and minimum continuous excitation may be given instead. Power Factor data should allow for series reactive losses on the User's System but exclude reactive compensation network susceptance specified separately in Schedule 5.

6. Where a Reactive Despatch Network Restriction is in place which requires the generator to maintain a target voltage set point this should be stated as an alternative to the size of the Reactive Despatch Network Restriction.
The following information is required from each **Network Operator** and where indicated with an asterisk from **Externally Interconnected System Operators** and/or **Interconnector Users** and a **Pumped Storage Generator**. Where indicated with a double asterisk, the information is only required from **Suppliers**.

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>UPDATE TIME</th>
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<tbody>
<tr>
<td><strong>Demand Control</strong></td>
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<tr>
<td>Demand met or to be relieved by Demand Control (averaging at the Demand Control Notification Level or more over a half hour) at each Connection Point.</td>
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<tr>
<td>Demand Control at time of National Electricity Transmission System weekly peak demand</td>
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<tr>
<td>Amount</td>
<td>MW</td>
<td>F yrs 0 to 5</td>
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<td>Duration</td>
<td>Min</td>
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<td>For each half hour</td>
<td>MW</td>
<td>Wks 2-8 ahead</td>
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<tr>
<td>For each half hour</td>
<td>MW</td>
<td>Days 2-12 ahead</td>
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<tr>
<td>For each half hour</td>
<td>MW</td>
<td>Previous calendar day</td>
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</tbody>
</table>

**Customer Demand Management** (at the Customer Demand Management Notification Level or more at the Connection Point)

| For each half hour | MW | Any time in Control Phase | OC1 |
| For each half hour | MW | Remainder of period | When changes occur to previous plan OC1 |
| For each half hour | MW | Previous calendar day | 0600 daily OC1 |

**In Scotland, Load Management Blocks**
For each block of 5MW or more, for each half hour

| MW | 11:00 OC1 |
### DATA DESCRIPTION

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
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<th>TIME COVERED</th>
<th>UPDATE TIME</th>
<th>DATA CAT.</th>
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<tbody>
<tr>
<td><em>Demand Control</em> or Pump Tripping Offered as Reserve</td>
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<tr>
<td>Magnitude of Demand or pumping load which is tripped</td>
<td>MW</td>
<td>Year ahead from week 24</td>
<td>Week 24</td>
<td>DPD</td>
</tr>
<tr>
<td>System Frequency at which tripping is initiated</td>
<td>Hz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time duration of System Frequency below trip setting for tripping to be initiated</td>
<td>S</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time delay from trip initiation to Tripping</td>
<td>S</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Emergency Manual Load Disconnection</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method of achieving load disconnection</td>
<td>Text</td>
<td>Year ahead from week 24</td>
<td>Annual in week 24</td>
<td>OC6</td>
</tr>
<tr>
<td>Annual ACS Peak Demand (Active Power) at Connection Point</td>
<td>MW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cumulative percentage of Connection Point Demand (Active Power) which can be disconnected by the following times from an instruction from NGET</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 mins</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 mins</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 mins</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 mins</td>
<td>%</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>25 mins</td>
<td>%</td>
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<tr>
<td>30 mins</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes**

1. **Network Operators** may delay the submission until calendar week 28.

- No information collated under this Schedule will be transferred to the **Relevant Transmission Licensees**
## AUTOMATIC LOW FREQUENCY DEMAND DISCONNECTION

**Schedule 12A**

**Time Covered:** Year ahead from week 24  
**Update Time:** Annual in week 24  
**Data Category:** OC6

Note: All demand refers to that at the time of forecast National Electricity Transmission System peak demand.  
Network Operators may delay the submission until calendar week 28  
No information collated under this schedule will be transferred to the Relevant Transmission Licensees

### Grid Supply Points
<table>
<thead>
<tr>
<th>Grid Supply Point</th>
<th>GSP Demand MW</th>
<th>Low Frequency Demand Disconnection Blocks MW</th>
<th>Residual demand MW</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 48.8Hz</td>
<td>2 48.75Hz</td>
</tr>
<tr>
<td>GSP1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GSP2</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>GSP3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total demand disconnected per block MW:

Total demand disconnection MW (% of aggregate demand of MW):
FAULT INFEED DATA

The data in this Schedule 13 is all Standard Planning Data, and is required from all Users other than Generators who are connected to the National Electricity Transmission System via a Connection Point (or who are seeking such a connection). A data submission is to be made each year in Week 24 (although Network Operators may delay the submission until Week 28). A separate submission is required for each node included in the Single Line Diagram provided in Schedule 5.

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>F.Yr 0</th>
<th>F.Yr 1</th>
<th>F.Yr 2</th>
<th>F.Yr 3</th>
<th>F.Yr 4</th>
<th>F.Yr 5</th>
<th>F.Yr 6</th>
<th>F.Yr 7</th>
<th>DATA to RTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHORT CIRCUIT INFEED TO THE NATIONAL ELECTRICITY TRANSMISSION SYSTEM FROM USERS SYSTEM AT A CONNECTION POINT (PC.A.2.5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Name of node or Connection Point</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ ■</td>
</tr>
<tr>
<td>Symmetrical three phase short-circuit current infeed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- at instant of fault</td>
<td>kA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ ■</td>
</tr>
<tr>
<td>- after subtransient fault current contribution has substantially decayed</td>
<td>Ka</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ ■</td>
</tr>
<tr>
<td>Zero sequence source impedances as seen from the Point of Connection or node on the Single Line Diagram (as appropriate) consistent with the maximum infeed above:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Resistance</td>
<td>% on 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ ■</td>
</tr>
<tr>
<td>- Reactance</td>
<td>% on 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ ■</td>
</tr>
<tr>
<td>Positive sequence X/R ratio at instance of fault</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ ■</td>
</tr>
<tr>
<td>Pre-Fault voltage magnitude at which the maximum fault currents were calculated</td>
<td>p.u.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ ■</td>
</tr>
<tr>
<td>Negative sequence impedances of User’s System as seen from the Point of Connection or node on the Single Line Diagram (as appropriate). If no data is given, it will be assumed that they are equal to the positive sequence values.</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Resistance</td>
<td>% on 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ ■</td>
</tr>
<tr>
<td>- Reactance</td>
<td>% on 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ ■</td>
</tr>
</tbody>
</table>
The data in this Schedule 14 is all Standard Planning Data, and is to be provided by Generators, with respect to all directly connected Power Stations, all Embedded Large Power Stations and all Embedded Medium Power Stations connected to the Subtransmission System. A data submission is to be made each year in Week 24.

**Fault infeeds via Unit Transformers**

A submission should be made for each Generating Unit with an associated Unit Transformer. Where there is more than one Unit Transformer associated with a Generating Unit, a value for the total infeed through all Unit Transformers should be provided. The infeed through the Unit Transformer(s) should include contributions from all motors normally connected to the Unit Board, together with any generation (e.g. Auxiliary Gas Turbines) which would normally be connected to the Unit Board, and should be expressed as a fault current at the Generating Unit terminals for a fault at that location.

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>F.Yr. 0</th>
<th>F.Yr. 1</th>
<th>F.Yr. 2</th>
<th>F.Yr. 3</th>
<th>F.Yr. 4</th>
<th>F.Yr. 5</th>
<th>F.Yr. 6</th>
<th>F.Yr. 7</th>
<th>DATA to RTL</th>
</tr>
</thead>
<tbody>
<tr>
<td>❄️</td>
<td>☐</td>
<td>☀️</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Name of Power Station</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Number of Unit Transformer</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Symmetrical three phase short-circuit current infeed through the Unit Transformer(s) for a fault at the Generating Unit terminals</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>- at instant of fault kA</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>- after subtransient fault current contribution has substantially decayed kA</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Positive sequence X/R ratio at instance of fault</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Subtransient time constant (if significantly different from 40ms) ms</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Pre-fault voltage at fault point (if different from 1.0 p.u.)</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>The following data items need only be supplied if the Generating Unit Step-up Transformer can supply zero sequence current from the Generating Unit side to the National Electricity Transmission System</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>Zero sequence source impedances as seen from the Generating Unit terminals consistent with the maximum infeed above:</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>- Resistance % on 100</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>- Reactance % on 100</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
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</tr>
</tbody>
</table>
Fault infeeds via Station Transformers

A submission is required for each Station Transformer directly connected to the National Electricity Transmission System. The submission should represent normal operating conditions when the maximum number of Gensets are Synchronised to the System, and should include the fault current from all motors normally connected to the Station Board, together with any Generation (eg Auxiliary Gas Turbines) which would normally be connected to the Station Board. The fault infeed should be expressed as a fault current at the hv terminals of the Station Transformer for a fault at that location.

If the submission for normal operating conditions does not represent the worst case, then a separate submission representing the maximum fault infeed that could occur in practice should be made.

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>F.Yr. 0</th>
<th>F.Yr. 1</th>
<th>F.Yr. 2</th>
<th>F.Yr. 3</th>
<th>F.Yr. 4</th>
<th>F.Yr. 5</th>
<th>F.Yr. 6</th>
<th>F.Yr. 7</th>
<th>DATA to RTL</th>
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<tbody>
<tr>
<td>(PC.A.2.5)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>□ ●</td>
</tr>
<tr>
<td>Name of Power Station</td>
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<tr>
<td>Number of Station Transformer</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ ●</td>
</tr>
<tr>
<td>Symmetrical three phase short-circuit current infeed for a fault at the Connection Point</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>□ ●</td>
</tr>
<tr>
<td>- at instant of fault</td>
<td>kA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>□ ●</td>
</tr>
<tr>
<td>- after subtransient fault current contribution has substantially decayed</td>
<td>kA</td>
<td></td>
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<td>□ ●</td>
</tr>
<tr>
<td>Positive sequence X/R ratio</td>
<td>At instance of fault</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>□ ●</td>
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<tr>
<td>Subtransient time constant (if significantly different from 40ms)</td>
<td>mS</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td>□ ●</td>
</tr>
<tr>
<td>Pre-fault voltage (if different from 1.0 p.u.) at fault point (See note 1)</td>
<td></td>
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<td>□ ●</td>
</tr>
<tr>
<td>Zero sequence source Impedances as seen from the Point of Connection Consistent with the maximum Infeed above:</td>
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<td></td>
<td></td>
<td>□ ●</td>
</tr>
<tr>
<td>- Resistance</td>
<td>% on 100</td>
<td></td>
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<td></td>
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<td>□ ●</td>
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<tr>
<td>- Reactance</td>
<td>% on 100</td>
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<td>□ ●</td>
</tr>
</tbody>
</table>

Note 1. The pre-fault voltage provided above should represent the voltage within the range 0.95 to 1.05 that gives the highest fault current

Note 2. % on 100 is an abbreviation for % on 100 MVA
Fault infeeds from Power Park Modules

A submission is required for the whole Power Park Module and for each Power Park Unit type or equivalent. The submission shall represent operating conditions that result in the maximum fault infeed. The fault current from all motors normally connected to the Power Park Unit’s electrical system shall be included. The fault infeed shall be expressed as a fault current at the terminals of the Power Park Unit, 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 the Grid Entry Point, or User System Entry Point if Embedded, for a fault at the Grid Entry Point, or User System Entry Point if Embedded.

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 NGET as soon as it is available, in line with PC.A.1.2

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>F.Yr. 0</th>
<th>F.Yr. 1</th>
<th>F.Yr. 2</th>
<th>F.Yr. 3</th>
<th>F.Yr. 4</th>
<th>F.Yr. 5</th>
<th>F.Yr. 6</th>
<th>F.Yr. 7</th>
<th>DATA to RTL</th>
</tr>
</thead>
<tbody>
<tr>
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<tr>
<td>Name of Power Station</td>
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<tr>
<td>Name of Power Park Module</td>
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<tr>
<td>Power Park Unit type</td>
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<td></td>
<td>□</td>
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</tr>
<tr>
<td>A submission shall be provided for the contribution of the entire Power Park Module and each type of Power Park Unit or equivalent to the positive, negative and zero sequence components of the short circuit current at the Power Park Unit terminals, or Common Collection Busbar, and Grid Entry Point or User System Entry Point if Embedded for (i) a solid symmetrical three phase short circuit (ii) a solid single phase to earth short circuit (iii) a solid phase to phase short circuit (iv) a solid two phase to earth short circuit at the Grid Entry Point or User System Entry Point if Embedded. If protective controls are used and active for the above conditions, a submission shall be provided in the limiting case where the protective control is not active. This case may require application of a non-solid fault, resulting in a retained voltage at the fault point.</td>
<td>□</td>
<td></td>
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<td>□</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>- A continuous time trace and table showing the root mean square of the positive, negative and zero sequence components of the fault current from the time of fault inception to 140ms after fault inception at 10ms intervals</td>
<td>Graphical and tabular</td>
<td>kA versus s</td>
<td>□</td>
<td></td>
<td>■</td>
<td></td>
<td></td>
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</tbody>
</table>
**Issue 4**  
DRC - 58  
26 June 2009

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>- A continuous time trace and table showing the positive, negative and zero sequence components of retained voltage at the terminals or <strong>Common Collection Busbar</strong>, if appropriate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- A continuous time trace and table showing the root mean square of the positive, negative and zero sequence components of retained voltage at the fault point, if appropriate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>For <strong>Power Park Units</strong> that utilise a protective control, such as a crowbar circuit,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- additional rotor resistance applied to the <strong>Power Park Unit</strong> under a fault situation</td>
<td>% on MVA</td>
<td>□ □</td>
</tr>
<tr>
<td>- additional rotor reactance applied to the <strong>Power Park Unit</strong> under a fault situation</td>
<td>% on MVA</td>
<td>□ □</td>
</tr>
<tr>
<td>Positive sequence X/R ratio of the equivalent at time of fault at the <strong>Common Collection Busbar</strong></td>
<td></td>
<td>□ □</td>
</tr>
<tr>
<td>Minimum zero sequence impedance of the equivalent at <strong>Common Collection Busbar</strong></td>
<td></td>
<td>□ □</td>
</tr>
<tr>
<td><strong>Active Power</strong> generated pre-fault</td>
<td>MW</td>
<td>□ □</td>
</tr>
<tr>
<td>Number of <strong>Power Park Units</strong> in equivalent generator</td>
<td></td>
<td>□ □</td>
</tr>
<tr>
<td>Power Factor (lead or lag)</td>
<td></td>
<td>□ □</td>
</tr>
<tr>
<td>Pre-fault voltage (if different from 1.0 p.u.) at fault point (See note 1)</td>
<td>p.u.</td>
<td>□ □</td>
</tr>
<tr>
<td>Items of reactive compensation switched in pre-fault</td>
<td></td>
<td>□ □</td>
</tr>
</tbody>
</table>

**Note 1.** The pre-fault voltage provided above should represent the voltage within the range 0.95 to 1.05 that gives the highest fault current.
The following data items must be supplied with respect to each Mothballed Generating Unit, Mothballed Power Park Module or Mothballed DC Converter at a DC Converter station:

<table>
<thead>
<tr>
<th>Power Station</th>
<th>Generating Unit, Power Park Module or DC Converter Name (e.g. Unit 1)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA CAT</th>
<th>GENERATING UNIT DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW output that can be returned to service</td>
<td>MW</td>
<td>DPD</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>&lt;1 month</th>
<th>1-2 months</th>
<th>2-3 months</th>
<th>3-6 months</th>
<th>6-12 months</th>
<th>&gt;12 months</th>
<th>Total MW being returned</th>
</tr>
</thead>
</table>
| Notes:
1. The time periods identified in the above table represent the estimated time it would take to return the Mothballed Generating Unit, Mothballed Power Park Module or Mothballed DC Converter at a DC Converter station to service once a decision to return has been made.
2. Where a Mothballed Generating Unit, Mothballed Power Park Module or Mothballed DC Converter at a DC Converter Station can be physically returned in stages covering more than one of the time periods identified in the above table then information should be provided for each applicable time period.
3. The estimated notice to physically return MW output to service should be determined in accordance with Good Industry Practice assuming normal working arrangements and normal plant procurement lead times.
4. The MW output values in each time period should be incremental MW values, e.g. if 150MW could be returned in 2 – 3 months and an additional 50MW in 3 – 6 months then the values in the columns should be Nil, Nil, 150, 50, Nil, Nil, 200 respectively.
5. Significant factors which may prevent the Mothballed Generating Unit, Mothballed Power Park Module or Mothballed DC Converter at a DC Converter Station achieving the estimated values provided in this table, excluding factors relating to Transmission Entry Capacity, should be appended separately.
ALTERNATIVE FUEL INFORMATION

The following data items for alternative fuels need only be supplied with respect to each Generating Unit whose primary fuel is gas.

**Power Station___________________________ Generating Unit Name (e.g. Unit 1) _____________________________**

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA CAT</th>
<th>GENERATING UNIT DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Alternative Fuel Type</td>
<td>Text</td>
<td>DPD</td>
<td>Oil distillate</td>
</tr>
<tr>
<td>(*please specify)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHANGEOVER TO ALTERNATIVE FUEL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For off-line changeover:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time to carry out off-line fuel changeover</td>
<td>Minutes</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Maximum output following off-line changeover</td>
<td>MW</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>For on-line changeover:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time to carry out on-line fuel changeover</td>
<td>Minutes</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Maximum output during on-line fuel changeover</td>
<td>MW</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Maximum output following on-line changeover</td>
<td>MW</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Maximum operating time at full load assuming:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Typical stock levels</td>
<td>Hours</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Maximum possible stock levels</td>
<td>Hours</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Maximum rate of replacement of depleted stocks of alternative fuels on the basis of Good Industry Practice</td>
<td>MWh(electrical)</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Is changeover to alternative fuel used in normal operating arrangements?</td>
<td>Text</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Number of successful changeovers carried out in the last NGET Financial Year (** delete as appropriate)</td>
<td>Text</td>
<td>DPD</td>
<td>0 / 1-5 /</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6-10 / 11-20 / &gt;20 **</td>
</tr>
<tr>
<td>DATA DESCRIPTION</td>
<td>UNITS</td>
<td>DATA CAT</td>
<td>GENERATING UNIT DATA</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>-------</td>
<td>----------</td>
<td>----------------------</td>
</tr>
<tr>
<td>CHANGEOVER BACK TO MAIN FUEL</td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>For off-line changeover:</td>
<td></td>
<td></td>
<td>2</td>
</tr>
<tr>
<td>Time to carry out off-line fuel changeover</td>
<td>Minutes</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>For on-line changeover:</td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Time to carry out on-line fuel changeover</td>
<td>Minutes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum output during on-line fuel changeover</td>
<td>MW</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes
1. Where a Generating Unit has the facilities installed to generate using more than one alternative fuel type details of each alternative fuel should be given.
2. Significant factors and their effects which may prevent the use of alternative fuels achieving the estimated values provided in this table (e.g. emissions limits, distilled water stocks etc.) should be appended separately.
The following data/text items are required from each **Generator** for each **BM Unit** at a **Large Power Station** as detailed in PC.A.5.7. Data is not required for **Generating Units** that are contracted to provide **Black Start Capability**, **Power Park Modules** or **Generating Units** that have an **Intermittent Power Source**. The data should be provided in accordance with PC.A.1.2 and also, where possible, upon request from **NGET** during a **Black Start**.

<table>
<thead>
<tr>
<th>Data Description</th>
<th>Units</th>
<th>Data Category</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>(PC.A.5.7) CUSC Contract</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assuming all <strong>BM Units</strong> were running immediately prior to the <strong>Total Shutdown</strong> or <strong>Partial Shutdown</strong> and in the event of loss of all external power supplies, provide the following information:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Expected time for the first and subsequent <strong>BM Units</strong> to be <strong>Synchronised</strong>, from the restoration of external power supplies, assuming external power supplies are not available for up to 24hrs</td>
<td>Tabular or Graphical</td>
<td>DPD</td>
</tr>
<tr>
<td>b) Describe any likely issues that would have a significant impact on a <strong>BM Unit's</strong> time to be <strong>Synchronised</strong> arising as a direct consequence of the inherent design or operational practice of the <strong>Power Station</strong> and/or <strong>BM Unit</strong>, e.g. limited barring facilities, time from a <strong>Total Shutdown</strong> or <strong>Partial Shutdown</strong> at which batteries would be discharged.</td>
<td>Text</td>
<td>DPD</td>
</tr>
<tr>
<td><strong>Block Loading Capability</strong>:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Provide estimated <strong>Block Loading Capability</strong> from 0MW to <strong>Registered Capacity</strong> of each <strong>BM Unit</strong> based on the unit being ‘hot’ (run prior to shutdown) and also ‘cold’ (not run for 48hrs or more prior to the shutdown). The <strong>Block Loading Capability</strong> should be valid for a frequency deviation of 49.5Hz – 50.5Hz. The data should identify any required ‘hold’ points.</td>
<td>Tabular or Graphical</td>
<td>DPD</td>
</tr>
</tbody>
</table>
Submissions by **Users** using this Schedule 17 shall commence in 2011 and shall then continue in each year thereafter.

<table>
<thead>
<tr>
<th>Access Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Identifier</td>
</tr>
<tr>
<td>-----------------</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

**Comments**

< End of **Data Registration Code (DRC)** >
GENERAL CONDITIONS

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, NGET).

GC.3 UNFORESEEN CIRCUMSTANCES

GC.3.1 If circumstances arise which the provisions of the Grid Code have not foreseen, NGET 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 NGET and those Users as to what should be done cannot be reached in the time available, NGET shall determine what is to be done. Wherever NGET 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 NGET 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. NGET 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 THE GRID CODE REVIEW PANEL

GC.4.1 NGET shall establish and maintain the Panel, which shall be a standing body to carry out the functions referred to in paragraph GC.4.2.

GC.4.2 The Panel shall:

(a) keep the Grid Code and its working under review;

(b) review all suggestions for amendments to the Grid Code which the Authority or any User or any Relevant Transmission Licensee (in respect of PC.3.4, PC.3.5, PC.6.2, PC Appendix A and C, CC.6.1, CC.6.2, CC.6.3, OC2.3.2, OC8 and GC.11, OC7.6, OC9.4 and OC9.5) may wish to submit to NGET for consideration by the Panel from time to time;

(c) publish recommendations as to amendments to the Grid Code that NGET or the Panel feels are necessary or desirable and the reasons for the recommendations;

(d) issue guidance in relation to the Grid Code and its implementation, performance and interpretation when asked to do so by any User;
(e) consider what changes are necessary to the **Grid Code** arising out of any unforeseen circumstances referred to it by **NGET** under GC.3; and

(f) consider and identify changes to the **Grid Code** to remove any unnecessary differences in the treatment of issues in Scotland from their treatment in England and Wales.

**GC.4.3** The **Panel** shall consist of:

(a) a Chairman and up to 4 members appointed by **NGET**;

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

(c) the following members:

(i) 3 persons representing those **Generators** each having **Large Power Stations** with a total **Registered Capacity** in excess of 3 GW;

(ii) a person representing those **Generators** each having **Large Power Stations** with a total **Registered Capacity** of 3 GW or less;

(iii) 2 persons representing the **Network Operators** in England and Wales;

(iv) a person representing the **Network Operators** in Scotland;

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

(vi) a person representing the **Non Embedded Customers**;

(vii) a person representing the **Generators** with **Small Power Stations** and/or **Medium Power Stations** (other than **Generators** who also have **Large Power Stations**);

(viii) a person representing the **BSC Panel**;

(ix) a person representing the **Externally Interconnected System Operators**;

(x) a person representing **Generators** with **Novel Units**; and


each of whom shall be appointed pursuant to the rules issued pursuant to GC.4.4.

**GC.4.4** The **Panel** shall establish and comply at all times with its own rules and procedures relating to the conduct of its business, which shall be approved by the **Authority**.
GC.4.5 NGET shall consult in writing all Authorised Electricity Operators which are liable to be materially affected in relation to all proposed amendments to the Grid Code and shall submit all proposed amendments to the Grid Code to the Panel for discussion prior to such consultation.

GC.4.6 NGET shall establish (and, where appropriate, revise from time to time) joint working arrangements with the STC Committee to facilitate the identification, coordination, making and implementation of change to the STC consequent on an amendment to the Grid Code in a full and timely manner. These working arrangements shall be such as enable the consideration development and evaluation of proposed amendments to the Grid Code to proceed in a full and timely manner and enable changes to the STC consequent on an amendment to the Grid Code to be made and given effect wherever possible (subject to any necessary consent of the Authority) at the same time as such approved amendment is made and given effect.

GC.5 COMMUNICATION BETWEEN NGET AND USERS

GC.5.1 Unless otherwise specified in the Grid Code, all instructions given by NGET and communications (other than relating to the submission of data and notices) between NGET and Users (other than Generators, DC Converter Station owners or Suppliers) shall take place between the NGET Control Engineer based at the Transmission Control Centre notified by NGET 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 NGET prior to connection.

GC.5.2 Unless otherwise specified in the Grid Code all instructions given by NGET and communications (other than relating to the submission of data and notices) between NGET and Generators and/or DC Converter Station owners and/or Suppliers shall take place between the NGET Control Engineer based at the Transmission Control Centre notified by NGET 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 NGET 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 NGET and communications (other than relating to the submission of data and notices) between NGET 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 NGET to each User prior to connection, or the User Control Centre, notified in the case of a Network Operator to NGET prior to connection, is moved to another location, whether due to an emergency or for any other reason, NGET shall notify the relevant User or the User shall notify NGET, 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 NGET 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 NGET.

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 NGET 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 NGET 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 facsimile transfer or by electronic mail to a specified address or addresses previously supplied by NGET 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 NGET, shall be addressed to the Transmission Control Centre at the address notified by NGET to each User prior to connection, or to such other Department within NGET or address, as NGET 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 NGET from time to time) at its address(es) notified by each User to NGET 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 NGET, then for the purposes of communication and co-ordination in operational timescales NGET can (for those purposes only) treat that User's System (or part thereof) as part of the National Electricity Transmission System, but, as between NGET 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 NGET and Users to agree and there is a failure so to agree the matter shall not without the consent of both NGET and Users be referred to arbitration pursuant to the rules of the Electricity Supply Industry Arbitration Association.

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 (a) or (b) to the annex, NGET, or in respect of (c) or (d) to the annex, the Relevant 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 NGET 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, NGET 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, NGET will establish a Panel working group if this was thought appropriate and in any event NGET shall undertake a consultation of Authorised Electricity Operators liable to be materially affected by the proposal.

(f) Following such consultation, NGET will report back to Panel members, either in writing or at a Panel meeting. If there was broad consensus in the consultation, then NGET 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 NGET of its decision. If the decision is to so implement the change, NGET 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, NGET 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, NGET 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.
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.

NGET has obligations under the STC to inform Relevant Transmission Licensees of certain data. NGET may pass on User data to a Relevant Transmission Licensee where:

a) NGET 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.

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 NGET 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.

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.

The provisions of the Appendix to the General Conditions apply in relation to issues arising out of the transition associated with the designation of amendments to the Grid Code by the Secretary of State in accordance with the provisions of the Energy Act 2004 for the purposes of Condition C14 of NGET’s Transmission Licence.

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, NGET agrees or where the relevant User and NGET fail to agree, where and to the extent that the Authority consents.
Annex to the General Conditions

The Electrical Standards are as follows:-

(a) Electrical Standards applicable in England and Wales

The Relevant Electrical Standards Document

<table>
<thead>
<tr>
<th>Document</th>
<th>Issue</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control Telephony Electrical Standard</td>
<td>1.0</td>
<td>17-Sept-2007</td>
</tr>
</tbody>
</table>

(b) The following specifications for electronic data communications facilities with reference to EDT and EDL facilities.

- EDT Interface Specification Issue 4
- EDT Submitter Guidance Note Dec-01
- EDL Message Interface Specifications Issue 4
- EDL Interface Specification Guidance Note Oct-01
- EDL Instruction Interface Valid Reason Codes Issue 2

(c) Scottish Electrical Standards for SPT’s Transmission System.

<table>
<thead>
<tr>
<th>SPTTS 1</th>
<th>Requirement</th>
<th>Issue</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPTTS 1</td>
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(d) Scottish **Electrical Standards** for **SHETL's Transmission System**.


2. **NGTS 2.1**: Substations Issue 2 May 1995


6. **NGTS 3.2.3**: Metal-Oxide surge arresters for use on 132, 275 and 400kV systems. Issue 2 May 1994.

7. **NGTS 3.2.4**: Current Transformers for protection and General use on the 132, 275 and 400kV systems. Issue 1 September 1992.

8. **NGTS 3.2.5**: Voltage Transformers for use on the 132, 275 and 400kV systems. Issue 2 March 1994.


11. **NGTS 3.2.9**: Post Insulators for Substations. Issue 1 May 1996.


Appendix to the *General Conditions*

**GC.A1 Introduction**

**GC.A1.1** This Appendix to the *General Conditions* deals with issues arising out of the transition associated with the designation of amendments to the *Grid Code* by the *Secretary of State* in accordance with the provisions of the Energy Act 2004 for the purposes of Condition C14 of *NGET’s Transmission Licence*. For the purposes of this Appendix to the *General Conditions*, the version of the *Grid Code* as amended by the changes designated by the *Secretary of State* and as further amended from time to time shall be referred to as the “GB Grid Code”.

**GC.A1.2** The provisions of this Appendix to the *General Conditions* shall only apply to *Users* (as defined in GC.A1.4) and *NGET* after Go-Live for so long as is necessary for the transition requirements referred to in GC.A1.1 and cut-over requirements (as further detailed in GC.A3.1) to be undertaken.

**GC.A1.3** In this Appendix to the *General Conditions*:

(a) *Existing E&W Users* and *E&W Applicants* are referred to as “E&W Users”;

(b) *Users* who as at 1 January 2005 have entered into an agreement or have accepted an offer for connection to and/or use of the *Transmission System* of *NGET* are referred to as “Existing E&W Users”;

(c) *Users* (or prospective *Users*) other than *Existing E&W Users* who apply during the *Transition Period* for connection to and/or use of the *Transmission System* of *NGET* are referred to as “E&W Applicants”;

(d) *Existing Scottish Users* and *Scottish Applicants* are referred to as “Scottish Users”;

(e) *Users* who as at 1 January 2005 have entered into an agreement or have accepted an offer for connection to and/or use of the *Transmission System* of either *Relevant Transmission Licensee* are referred to as “Existing Scottish Users”;

(f) *Users* (or prospective *Users*) other than *Existing Scottish Users* who apply during the *Transition Period* for connection to and/or use of the *Transmission System* of either *Relevant Transmission Licensee* are referred to as “Scottish Applicants”;

(g) the term “*Transition Period*” means the period from Go-Active to Go-Live (unless it is provided to be different in relation to a particular provision), and is the period with which this Appendix to the *General Conditions* deals;

(h) the term “*Interim GB SYS*” means the document of that name referred to in Condition C11 of *NGET’s Transmission Licence*;

(i) the term “*Go-Active*” means the date on which the amendments designated by the *Secretary of State* to the *Grid Code* in accordance with the Energy Act 2004 come into effect; and
(j) the term “Go-Live” means the date which the Secretary of State indicates in a direction shall be the BETTA go-live date.

GC.A1.4 The provisions of GC.2.1 shall not apply in respect of this Appendix to the General Conditions, and in this Appendix to the General Conditions the term “Users” means:

(a) Generators;
(b) Network Operators;
(c) Non-Embedded Customers;
(d) Suppliers;
(e) BM Participants; and
(f) Externally Interconnected System Operators,

(g) DC Converter Station owners

The provisions of this Appendix to the General Conditions affect the rights and obligations of such Users under the other provisions of the GB Grid Code.

GC.A1.5 The GB Grid Code has been introduced with effect from Go-Active pursuant to the relevant licence changes introduced into NGET’s Transmission Licence. NGET is required to implement and comply, and Users to comply, with the GB Grid Code subject as provided in this Appendix to the General Conditions, which provides for the extent to which the GB Grid Code is to apply to NGET and Users during the Transition Period.

GC.A1.6 This Appendix to the General Conditions comprises:

(a) this Introduction;

(b) GB Grid Code transition issues; and

(c) Cut-over issues.

GC.A1.7 Without prejudice to GC.A1.8, the failure of any User or NGET to comply with this Appendix to the General Conditions shall not invalidate or render ineffective any part of this Appendix to the General Conditions or actions undertaken pursuant to this Appendix to the General Conditions.

GC.A1.8 A User or NGET shall not be in breach of any part of this Appendix to the General Conditions to the extent that compliance with that part is beyond its power by reason of the fact that any other User or NGET is in default of its obligations under this Appendix to the General Conditions.

GC.A1.9 Without prejudice to any specific provision under this Appendix to the General Conditions as to the time within which or the manner in which a User or NGET should perform its obligations under this Appendix to the General Conditions, where a User or NGET is required to take any step or measure under this
Appendix to the **General Conditions**, such requirement shall be construed as including any obligation to:

(a) take such step or measure as quickly as reasonably practicable; and

(b) do such associated or ancillary things as may be necessary to complete such step or measure as quickly as reasonably practicable.

**GC.A1.10** NGET shall use reasonable endeavours to identify any amendments it believes are needed to the **GB Grid Code** in respect of the matters referred to for the purposes of Condition C14 of **NGET's Transmission Licence** and in respect of the matters identified in GC.A1.11, and, having notified the Authority of its consultation plans in relation to such amendments, NGET shall consult in accordance with the instructions of the Authority concerning such proposed amendments.

**GC.A1.11** The following matters potentially require amendments to the **GB Grid Code**:

(a) The specific detail of the obligations needed to manage implementation in the period up to and following (for a temporary period) Go-Live to achieve the change to operation under the **GB Grid Code** (to be included in GC.A3).

(b) Information (including data) and other requirements under the **GB Grid Code** applicable to Scottish Users during the Transition Period (to be included in GC.A2).

(c) The conclusions of Ofgem/DTI in relation to small and/or embedded generator issues under BETTA and allocation of access rights on a GB basis.

(d) Any arrangements required to make provision for operational liaison, including Black Start and islanding arrangements in Scotland.

(e) Any arrangements required to make provision for cascade hydro BM Units.

(f) Any consequential changes to the safety co-ordination arrangements resulting from STC and STC procedure development.

(g) Any arrangements required to reflect the Electrical Standards for the Transmission Systems of SPT and SHETL.

(h) The conclusions of Ofgem/DTI in relation to planning and operating standards.

**GC.A1.12** NGET shall notify the Authority of any amendments that NGET identifies as needed pursuant to GC.A1.10 and shall make such amendments as the Authority approves.

**GC.A2** **GB Grid Code Transition**

**General Provisions**
GC.A2.1 The provisions of the **GB Grid Code** shall be varied or suspended (and the requirements of the **GB Grid Code** shall be deemed to be satisfied) by or in accordance with, and for the period and to the extent set out in this GC.A2, and in accordance with the other applicable provisions in this Appendix to the **General Conditions**.

**GC.A2.2 E&W Users:**

In furtherance of the licence provisions referred to in GC.A1.5, **E&W Users** shall comply with the **GB Grid Code** during the **Transition Period**, but shall comply with and be subject to it subject to this Appendix to the **General Conditions**, including on the basis that:

(a) during the **Transition Period** the **Scottish Users** are only complying with the **GB Grid Code** in accordance with this Appendix to the **General Conditions**; and

(b) during the **Transition Period** the **GB Transmission System** shall be limited to the **Transmission System** of **NGET**, and all rights and obligations of **E&W Users** in respect of the **GB Transmission System** under the **GB Grid Code** shall only apply in respect of the **Transmission System** of **NGET**, and all the provisions of the **GB Grid Code** shall be construed accordingly.

**GC.A2.3 Scottish Users:**

In furtherance of the licence provisions referred to in GC.A1.5, **Scottish Users** shall comply with the **GB Grid Code** and the **GB Grid Code** shall apply to or in relation to them during the **Transition Period** only as provided in this Appendix to the **General Conditions**.

**GC.A2.4 NGET:**

In furtherance of the licence provisions referred to in GC.A1.5, **NGET** shall implement and comply with the **GB Grid Code** during the **Transition Period**, but shall implement and comply with and be subject to it subject to, and taking into account, all the provisions of this Appendix to the **General Conditions**, including on the basis that:

(a) during the **Transition Period** **NGET**'s rights and obligations in relation to **E&W Users** in respect of the **GB Transmission System** under the **GB Grid Code** shall only apply in respect of the **Transmission System** of **NGET**, and all the provisions of the **GB Grid Code** shall be construed accordingly; and

(b) during the **Transition Period** **NGET**'s rights and obligations in relation to **Scottish Users** in respect of the **GB Transmission System** under the **GB Grid Code** shall only be as provided in this Appendix to the **General Conditions**.

**Specific Provisions**

**GC.A2.5 Definitions:**
The provisions of the GB Grid Code Glossary and Definitions shall apply to and for the purposes of this Appendix to the General Conditions except where provided to the contrary in this Appendix to the General Conditions.

GC.A2.6 Identification of Documents:

In the period beginning at Go-Active, Scottish Users will work with NGET to identify and agree with NGET any documents needed to be in place in accordance with the GB Grid Code, to apply from Go-Live or as earlier provided for under this Appendix to the General Conditions, including (without limitation) Site Responsibility Schedules, Gas Zone Diagrams and OC9 Desynchronised Island Procedures.

GC.A2.7 Data:

Each Scottish User must provide, or enable a Relevant Transmission Licensee to provide, NGET, as soon as reasonably practicable upon request, with all data which NGET needs in order to implement, with effect from Go-Live, the GB Grid Code in relation to Scotland. This data will include, without limitation, the data that a new User is required to submit to NGET under CC.5.2. NGET is also entitled to receive data on Scottish Users over the Relevant Transmission Licensees’ SCADA links to the extent that NGET needs it for use in testing and in order to implement, with effect from Go-Live, the GB Grid Code in relation to Scotland. After Go-Live such data shall, notwithstanding GC.A1.2, be treated as though it had been provided to NGET under the enduring provisions of the GB Grid Code.

GC.A2.8 Verification of Data etc:

NGET shall be entitled to request from a Scottish User (which shall comply as soon as reasonably practicable with such a request) confirmation and verification of any information (including data) that has been received by a Relevant Transmission Licensee under an existing grid code and passed on to NGET in respect of that Scottish User. After Go-Live such information (including data) shall, notwithstanding GC.A1.2, be treated as though provided to NGET under the enduring provisions of the GB Grid Code.

GC.A2.9 Grid Code Review Panel:

(a) The individuals whose names are notified to NGET by the Authority prior to Go-Active as Panel members (and alternate members, if applicable) are agreed by Users (including Scottish Users) and NGET to constitute the Panel members and alternate members of the Grid Code Review Panel as at the first meeting of the Grid Code Review Panel after Go-Active as if they had been appointed as Panel members (and alternate members) pursuant to the relevant provisions of the Constitution and Rules of the Grid Code Review Panel incorporating amendments equivalent to the amendments to GC.4.2 and GC.4.3 designated by the Secretary of State in accordance with the provisions of the Energy Act 2004 for the purposes of Condition C14 of NGET’s Transmission Licence.

(b) The provisions of GC.4 of the GB Grid Code shall apply to, and in respect of, Scottish Users from Go-Active.
GC.A2.10 **Interim GB SYS:**

Where requirements are stated in, or in relation to, the *GB Grid Code* with reference to the *Seven Year Statement*, they shall be read and construed as necessary as being with reference to the *Interim GB SYS*.

GC.A2.11 **General Conditions:**

The provisions of GC.4, GC.12 and GC.13.2 of the *GB Grid Code* shall apply to and be complied with by *Scottish Users* in respect of this Appendix to the *General Conditions*.

GC.A2.12 **OC2 Data**

(a) The following provisions of the *GB Grid Code* shall apply to and be complied with by *Scottish Users* with effect from the relevant date indicated below:

(i) OC2.4.1.2.3 (a) from 19 January 2005 in respect of 2 to 52 week submissions,

(ii) OC2.4.1.2.4 (c) from 25 February 2005 in respect of 2 to 49 day submissions,

(iii) OC2.4.1.2.4 (b) from 22 March 2005 in respect of 2 to 14 day submissions,

The data to be submitted in respect of OC2.4.1.2.3 (a) and OC2.4.1.2.4 (b) and (c) need only be in respect of dates on or after 1 April 2005.

GC.A3 **Cut-over**

GC.A3.1 It is anticipated that it will be appropriate for arrangements to be put in place for final transition to BETTA in the period up to and following (for a temporary period) *Go-Live*, for the purposes of:

(a) managing the transition from operations under the *Grid Code* as in force immediately prior to *Go-Active* to operations under the *GB Grid Code* and the *BSC* as in force on and after *Go-Active*;

(b) managing the transition from operations under the existing grid code applicable to *Scottish Users* as in force immediately prior to *Go-Active* to operations under the *GB Grid Code* as in force on and after *Go-Active*;

(c) managing the transition of certain data from operations under the existing grid code applicable to *Scottish Users* before and after *Go-Active*; and

(d) managing *GB Grid Code* systems, processes and procedures so that they operate effectively at and from *Go-Live*.

GC.A3.2

(a) The provisions of BC1 (excluding BC1.5.1, BC1.5.2 and BC1.5.3) shall apply to and be complied with by *Scottish Users* and by *NGET* in respect
of such Scottish Users with effect from 11:00 hours on the day prior to Go-Live

(b) Notwithstanding (a) above, Scottish Users may submit data for Go-Live 3 days in advance of Go-Live on the basis set out in the Data Validation, Consistency and Defaulting Rules which shall apply to Scottish Users and NGET in respect of such Scottish Users on that basis and for such purpose.

(c) The Operational Day for the purposes of any submissions by Scottish Users prior to Go-Live under a) and b) above for the day of Go-Live shall be 00:00 hours on Go Live to 05:00 hours on the following day.

(d) The provisions of BC2 shall apply to and be complied with by Scottish Users and by NGET in respect of such Scottish Users with effect from 23:00 hours on the day prior to Go-Live.

(e) The provisions of OC7.4.8 shall apply to and be complied with by Scottish Users and by NGET in respect of such Scottish Users with effect from 11:00 hours on the day prior to Go-Live.

(f) In order to facilitate cut-over, Scottish Users acknowledge and agree that NGET will exchange data submitted by such Scottish Users under BC1 prior to Go-Live with the Scottish system operators to the extent necessary to enable the cut-over.

(g) Except in the case of Reactive Power, Scottish Users should only provide Ancillary Services from Go-Live where they have been instructed to do so by NGET. In the case of Reactive Power, at Go-Live a Scottish Users Mvar output will be deemed to be the level instructed by NGET under BC2, following this Scottish Users should operate in accordance with BC2.A.2.6 on the basis that Mvar output will be allowed to vary with system conditions.

< End of GC >
NGET’s Transmission Licence sets out the way in which changes to the Grid Code are to be made and reference is also made to NGET’s obligations under the General Conditions.

All pages re-issued have the revision number and date of the revision on the lower right hand corner of the page. The changes to the text since the previous page issue are indicated by a vertical line to the right hand side of the text. Where repagination or repositioning of the text on other pages has been found necessary but the text itself has remained unchanged the re-issued pages have only the revision number and date of the revision included.

The Grid Code was introduced in March 1990 and this 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.

The following 'index to revisions' provides a checklist to the pages and sections of the Grid Code changed by each revision to Issue 4 of the Grid Code.

All inquiries in relation to revisions to the Grid Code, including revisions to Issues 1, 2, 3 and 4, should be addressed to the Grid Code development team at the address given at the front of the Grid Code.
## Revision 1

**Effective Date:** 10\(^{th}\) February 2010

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