THIS DOCUMENT IS ISSUED BY:-

NATIONAL GRID COMPANY PLC
COMMERCIAL, INDUSTRY CODES UNIT
NATIONAL GRID TRANSCO HOUSE
WARWICK TECHNOLOGY PARK
GALLOWS HILL
WARWICK
CV34 6DA

TEL: 01926 656335

REGISTERED OFFICE: 1-3 Strand
London
WC2N 5EH
THE GRID CODE

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PREFACE

1. The operating procedures and principles governing NGC’s relationship with all Users of the GB Transmission System, be they Generators, 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 NGC 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 NGC 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 NGC 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) 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 NGC from Users, and by Users from NGC, 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:

**Act**

The Electricity Act 1989 (as amended by the Utilities Act 2000) and the Energy Act 2004.

**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:

- $1000 \text{ Wh} = 1 \text{ kWh}$
- $1000 \text{ kWh} = 1 \text{ MWh}$
- $1000 \text{ MWh} = 1 \text{ GWh}$
- $1000 \text{ GWh} = 1 \text{ TWh}$.

**Active Power**

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

- $1000 \text{ Watts} = 1 \text{ kW}$
- $1000 \text{ kW} = 1 \text{ MW}$
- $1000 \text{ MW} = 1 \text{ GW}$
- $1000 \text{ GW} = 1 \text{ TW}$.

**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.

**Ancillary Service**

A System Ancillary Service and/or a Commercial Ancillary Service, as the case may be.

**Ancillary Services Agreement**

An agreement between a User and NGC for the payment by NGC to that User in respect of the provision by such User of Ancillary Services.

**Annual Average Cold Spell Conditions or ACS Conditions**

A particular combination of weather elements which gives rise to a level of peak Demand within an NGC Financial Year which has a 50% chance of being exceeded as a result of weather variation alone.

**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 kVA = 1 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**.

<table>
<thead>
<tr>
<th><strong>Area Manager</strong></th>
<th>A manager appointed by <strong>NGC</strong> whose management unit is a geographical area embracing part of the <strong>NGC Transmission System</strong>.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Authorised Electricity Operator</strong></td>
<td>Any person (other than <strong>NGC</strong> in its capacity as operator of the <strong>NGC GB Transmission System</strong>) who is authorised under the <strong>Act</strong> to generate, transmit, participate in the transmission of, distribute or supply electricity.</td>
</tr>
<tr>
<td><strong>Automatic Voltage Regulator or AVR</strong></td>
<td>A continuously acting automatic excitation system to control a <strong>Generating Unit</strong> terminal voltage.</td>
</tr>
<tr>
<td><strong>Authority for Access</strong></td>
<td>An authority which grants the holder the right to unaccompanied access to sites containing exposed <strong>HV</strong> conductors.</td>
</tr>
<tr>
<td><strong>Authority, The</strong></td>
<td>The <strong>Authority</strong> established by section 1 (1) of the Utilities Act 2000</td>
</tr>
<tr>
<td><strong>Auxiliaries</strong></td>
<td>Any item of <strong>Plant</strong> and/or <strong>Apparatus</strong> not directly a part of the boiler plant or <strong>Generating Unit</strong>, but required for the boiler plant's or <strong>Generating Unit's</strong> functional operation.</td>
</tr>
<tr>
<td><strong>Auxiliary Diesel Engine</strong></td>
<td>A diesel engine driving a <strong>Generating Unit</strong> which can supply a <strong>Unit Board</strong> or <strong>Station Board</strong>, which can start without an electrical power supply from outside the <strong>Power Station</strong> within which it is situated.</td>
</tr>
<tr>
<td><strong>Auxiliary Gas Turbine</strong></td>
<td>A <strong>Gas Turbine Unit</strong>, which can supply a <strong>Unit Board</strong> or <strong>Station Board</strong>, which can start without an electrical power supply from outside the <strong>Power Station</strong> within which it is situated.</td>
</tr>
<tr>
<td><strong>Average Conditions</strong></td>
<td>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).</td>
</tr>
<tr>
<td><strong>Back-Up Protection</strong></td>
<td><strong>Protection</strong> 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 <strong>Main Protection</strong> to operate or in case of failure to operate of a circuit-breaker other than the associated circuit breaker.</td>
</tr>
<tr>
<td><strong>Balancing and Settlement Code or</strong></td>
<td>The code of that title as from time to time amended.</td>
</tr>
</tbody>
</table>
**Balancing Code or BC**

That portion of the Grid Code which specifies the Balancing Mechanism process.

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**Balancing Mechanism**

Has the meaning set out in the NGC’s Transmission Licence.

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**Balancing Mechanism Reporting Agent or BMRA**

Has the meaning set out in the BSC.

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**Balancing Mechanism Reporting Service or BMRS**

Has the meaning set out in the BSC.

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**Balancing Principles Statement**

A statement prepared by NGC in accordance with Special Condition AA4C16 of the NGC’s Transmission Licence.

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**Bid-Offer Acceptance**

a) A communication issued by NGC in accordance with BC2.7; or

b) an Emergency Instruction to the extent provided for in BC2.9.2.3.

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**Bid-Offer Data**

Has the meaning set out in the BSC.

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**Bilateral Agreement**

Has the meaning set out in the NGC’s Transmission Licence.

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**Black Start**

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

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**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 NGC, within two hours, without an external electrical power supply.

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**Black Start Stations**

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

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**Black Start Test**

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

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**BM Participant**

A person who is responsible for and controls one or more BM Units. 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 NGC GB Transmission System Warning**

The notification given to Users when a NGC GB Transmission System Warning is cancelled.

**Caution Notice**

A notice conveying a warning against interference.

**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 kilometer 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 NGC 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).

**Committed Project Planning Data**
Data relating to a User Development once the offer for a CUSC Contract is accepted.

**Completion Date**
Has the meaning set out in the Bilateral Agreement with each User to that term or in the absence of that term to such other term reflecting the date when a User is expected to connect to or start using the NGC GB Transmission System.

**Complex**
A Connection Site together with the associated Power Station and/or Network Operator substation and/or associated Plant and/or Apparatus, as appropriate.

**Connection**
That portion of the Grid Code which is identified as the Connection.
**Conditions or CC**  
Conditions.

**Connection Entry Capacity**  
Has the meaning set out in the CUSC.

**Connected Planning Data**  
Data which replaces data containing estimated values assumed for planning purposes by validated actual values and updated estimates for the future and by updated forecasts for Forecast Data items such as Demand.

**Connection Point**  
A Grid Supply Point or Grid Entry Point, as the case may be.

**Connection Site**  
An NGCA Transmission Site or User Site, as the case may be.

**Construction Agreement**  
Has the meaning set out in the NGC's Transmission Licence.

**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 an NGC a Transmission Control Centre and which 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 NGC GB Transmission System or a User System other than a Generator's System or an External System.

**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 in England or Wales at a Large Power Station or at a Medium Power Station or with a Demand Capacity with a magnitude of 50MW or more (in England and Wales) or 5MW or more (in Scotland), is physically controlled by a BM Participant; or

c) In the case of any other BM Unit, data submission is co-ordinated for a BM Participant and instructions are received from NGC,
as the case may be. For a **Generator** this will normally be at a **Power Station**. 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 method by which a **User’s Responsible Engineer/Operator** and **NGC 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 the **NGC’s Transmission Licence**

### CUSC Contract
One or more of the following agreements as envisaged in [Supplementary Standard Condition C7F](#) of the **NGC’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 the **NGC’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 **NGC** 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 **NGC** under the **Grid Code** as set out in the document “Data Validation, Consistency and Defaulting Rules” - Issue 6, dated 25th May 2004. The document is available on the National Grid website or upon
request from NGC.

**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 NGC);

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

(c) Demand reduction instructed by NGC;

(d) automatic low Frequency Demand Disconnection;

(e) emergency manual Demand Disconnection.

**Demand Control Notification Level**

The level above which a Network Operator has to notify NGC of its proposed or achieved use of Demand Control which is 12 MW in England and Wales and 5 MW in Scotland.

**Designed Minimum Operating Level**

The output (in whole MW) below which a Genset has no High Frequency Response capability.

**De-Synchronise**

a) The act of taking a Generating Unit 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 additional data which NGC requires under the PC in support of Standard Planning Data. Generally it is first supplied once a Bilateral Agreement is entered into.

** 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 NGC GB Transmission System or a User System as the case may be.

**Disputes Resolution Procedure**
The procedure described in the CUSC relating to disputes resolution.

**Distribution Code**
The distribution code required to be drawn up by each Electricity Distribution Licence holder and approved by the Authority, as from time to time revised with the approval of the Authority.

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

**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 retained 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 NGC 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 NGCa Transmission Licensee (but with no other connection to the NGCGB Transmission System).

Emergency Instruction

An instruction issued by NGC in emergency circumstances, pursuant to BC2.9, to the Control Point of a User. In the case of such instructions applicable to a BM Unit, it may require an action or response which is outside the Dynamic Parameters, QPN or Other Relevant Data, and may include an instruction to trip a Genset.

Engineering Recommendations

The documents referred to as such and issued by the Electricity Association or the former Electricity Council.

Estimated Registered Data

Those items of Standard Planning Data and Detailed Planning Data which either upon connection will become Registered Data, or which for the purposes of the Plant and/or Apparatus concerned as at the date of submission are Registered Data, but in each case which for the seven succeeding NGC Financial Years will be an estimate of what is expected.

European Specification

A common technical specification, a British Standard implementing a European standard or a European technical approval. The terms "common technical specification", "European standard" and "European technical approval" shall have the meanings respectively ascribed to them in the Regulations.

Event

An unscheduled or unplanned (although it may be anticipated) occurrence on, or relating to, a System (including Embedded Power Stations) including, without limiting that general description, faults, incidents and breakdowns and adverse weather conditions being experienced.

Exciter

The source of the electrical power providing the field current of a synchronous machine.

Excitation System

The equipment providing the field current of a machine, including all regulating and control elements, as well as field discharge or suppression equipment and protective devices.

Excitation System No-Load Negative Ceiling

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
Voltage 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].

**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 NGC 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 NGC) 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 NGC 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
<table>
<thead>
<tr>
<th><strong>Export and Import Limits</strong></th>
<th>Those parameters listed in Appendix 1 to BC1 under the heading BM Unit Data – Export and Import Limits.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External Interconnection</strong></td>
<td><strong>Apparatus</strong> for the transmission of electricity to or from the NGC GB 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.</td>
</tr>
<tr>
<td><strong>Externally Interconnected System Operator or EISO</strong></td>
<td>A person who operates an External System which is connected to the NGC GB Transmission System or a User System by an External Interconnection.</td>
</tr>
<tr>
<td><strong>External System</strong></td>
<td>In relation to an Externally Interconnected System Operator means the transmission or distribution system which it owns or operates which is located outside England and Wales Great Britain and any Apparatus or Plant which connects that system to the External Interconnection and which is owned or operated by such Externally Interconnected System Operator.</td>
</tr>
<tr>
<td><strong>Fault Current Interruption Time</strong></td>
<td>The time interval from fault inception until the end of the break time of the circuit breaker (as declared by the manufacturers).</td>
</tr>
<tr>
<td><strong>Fast Start</strong></td>
<td>A start by a Genset with a Fast Start Capability.</td>
</tr>
<tr>
<td><strong>Fast Start Capability</strong></td>
<td>The ability of a Genset to be Synchronised and Loaded up to full Load within 5 minutes.</td>
</tr>
<tr>
<td><strong>Final Generation Outage Programme</strong></td>
<td>An outage programme as agreed by NGC 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 NGC GB Transmission System outages will be planned.</td>
</tr>
<tr>
<td><strong>Final Physical Notification Data</strong></td>
<td>Has the meaning set out in the BSC.</td>
</tr>
<tr>
<td><strong>Final Report</strong></td>
<td>A report prepared by the Test Proposer at the conclusion of a System Test for submission to NGC (if it did not propose the System Test) and other members of the Test Panel.</td>
</tr>
<tr>
<td><strong>Financial Year</strong></td>
<td>Bears the meaning given in Condition A1 (Definitions and Interpretation) of</td>
</tr>
</tbody>
</table>
**NGC’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 NGC 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 NGC in relation to operation in Frequency Sensitive Mode (or such greater number as may be agreed between NGC 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.

**Fuel Security Code**  
The document of that title designated as such by the Secretary of State, as from time to time amended.

**Gas Turbine Unit**  
A Generating Unit driven by a gas turbine (for instance by an aero-engine).
**Gas Zone Diagram**
A single line diagram showing boundaries of, and interfaces between, gas-insulated HV Apparatus modules which comprise part, or the whole, of a substation at a Connection Site, together with the associated stop valves and gas monitors required for the safe operation of the NGC GB Transmission System or the User System, as the case may be.

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

<table>
<thead>
<tr>
<th>GB National Demand</th>
<th>The amount of electricity supplied from the Grid Supply Points plus:-</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• that supplied by Embedded Large Power Stations, and</td>
</tr>
<tr>
<td></td>
<td>• GB Transmission System Losses,</td>
</tr>
<tr>
<td></td>
<td>minus:-</td>
</tr>
<tr>
<td></td>
<td>• the Demand taken by Station Transformers and Pumped Storage Units’</td>
</tr>
<tr>
<td></td>
<td>and, for the purposes of this definition, does not include:-</td>
</tr>
<tr>
<td></td>
<td>• any exports from the GB Transmission System across External Interconnections.</td>
</tr>
</tbody>
</table>

| GB Transmission System                                  | The system consisting (wholly or mainly) of high voltage electric lines owned or operated by NGC and used for the transmission of electricity from one Power Station to a sub-station or to another Power Station or between sub-stations or to or from any External Interconnection, and includes any Plant and Apparatus and meters owned or operated by NGC in connection with the transmission of electricity but does not include any Remote Transmission Assets. |

<table>
<thead>
<tr>
<th>GB Transmission System Demand</th>
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</tr>
</thead>
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<td></td>
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</tr>
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<td></td>
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</tr>
<tr>
<td></td>
<td>and, for the purposes of this definition, includes:-</td>
</tr>
<tr>
<td></td>
<td>• the Demand taken by Station Transformers and Pumped Storage Units.</td>
</tr>
</tbody>
</table>

| GB Transmission System Losses                           | The losses of electricity incurred on the GB Transmission System.                                   |

<p>| GB Transmission System Study Network                    | A computer file containing details of transmission plant and Large Power Stations and the configuration of the connection between them, together with data on Demand and on the GB Transmission System. These details, when read together as represented in the file, form NGC's view of... |</p>
<table>
<thead>
<tr>
<th><strong>Data File</strong></th>
<th>an appropriate representation of the GB Transmission System for technical analysis purposes only. The file will only deal with the GB Transmission System</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GB Transmission System Warning - Demand Control Imminent</strong></td>
<td>A warning issued by NGC, 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 NGC within 30 minutes.</td>
</tr>
<tr>
<td><strong>GB Transmission System Warning - High Risk of Demand Reduction</strong></td>
<td>A warning issued by NGC, 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.</td>
</tr>
<tr>
<td><strong>GB Transmission System Warning - Inadequate System Margin</strong></td>
<td>A warning issued by NGC, 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.</td>
</tr>
<tr>
<td><strong>GB Transmission System Warning - Risk of System Disturbance</strong></td>
<td>A warning issued by NGC, 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.</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 Output Usable and forecast Demand.</td>
</tr>
<tr>
<td><strong>Generating Unit</strong></td>
<td>Unless otherwise provided in the Grid Code, any Apparatus which produces electricity, including, for the avoidance of doubt, a CCGT Unit.</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 England and Wales Great Britain.</td>
</tr>
<tr>
<td><strong>Generator Performance Chart</strong></td>
<td>A diagram which shows the MW and Mvar capability limits within which a Generating Unit will be expected to operate under steady state conditions.</td>
</tr>
</tbody>
</table>
**Genset**

A Generating Unit or CCGT Module at a Large Power Station or any Generating Unit or CCGT Module which is directly connected to the GB Transmission System.

**Good Industry Practice**

The exercise of that degree of skill, diligence, prudence and foresight which would reasonably and ordinarily be expected from a skilled and experienced operator engaged in the same type of undertaking under the same or similar circumstances.

**Governor Deadband**

The total magnitude of the change in steady state speed (expressed as a range of Hz (± x Hz) where “x” is a numerical value) within which there is no resultant change in the position of the governing valves of the speed/load Governing System.

**Great Britain or GB**

Has the meaning set out in Schedule 1 of NGC’s Transmission Licence.

**Grid Code Review Panel or Panel**

The panel with the functions set out in GC.4.

**Grid Entry Point**

A point at which a Generating Unit or a CCGT Module or a CCGT Unit, as the case may be, which is directly connected to the NGC GB Transmission System connects to the NGC GB Transmission System.

**Grid Supply Point**

A point of supply from the NGC GB Transmission System to Network Operators or Non-Embedded Customers.

**High Frequency Response**

An automatic reduction in Active Power output in response to an increase in System Frequency above the Target Frequency (or such other level of Frequency as may have been agreed in an Ancillary Services Agreement). This reduction in Active Power output must be in accordance with the provisions of the relevant Ancillary Services Agreement which will provide that it will be released increasingly with time over the period 0 to 10 seconds from the time of the Frequency increase on the basis set out in the Ancillary Services Agreement and fully achieved within 10 seconds of the time of the start of the Frequency increase and it must be sustained at no lesser reduction thereafter. The interpretation of the High Frequency Response to a + 0.5 Hz frequency change is shown diagrammatically in Figure CC.A.3.3.

**High Voltage or HV**

A voltage exceeding 650 volts in England and Wales, a voltage exceeding 1000 volts in Scotland.

**HV Generator Connections**

Apparatus connected at the same voltage as that of the NGC GB Transmission System, including Users' circuits, the higher voltage windings of Users' transformers and associated connection Apparatus.

**HP Turbine Power**

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
<table>
<thead>
<tr>
<th>Fraction</th>
<th>Registered Capacity.</th>
</tr>
</thead>
</table>

**IEC**

International Electrotechnical Commission.

**IEC Standard**

A standard approved by the International Electrotechnical Commission.

**Implementing Safety Co-ordinator**


**Incident Centre**

A centre established by NGC or a User as the focal point in NGC or in that User, as the case may be, for the communication and dissemination of information between the senior management representatives of NGC, or of that User, as the case may be, and the relevant other parties during a Joint System Incident in order to avoid overloading NGC’s, or that User’s, as the case may be, existing operational/control arrangements.

**Indicated Constraint Boundary Margin**

The difference between a constraint boundary transfer limit and the difference between the sum of BM Unit Maximum Export Limits and the forecast of local Demand within the constraint boundary.

**Indicated Imbalance**

The difference between the sum of Physical Notifications for BM Units comprising Generating Units or CCGT Modules and the forecast of Demand for the whole or any part of the System.

**Indicated Margin**

The difference between the sum of BM Unit Maximum Export Limits submitted and the forecast of Demand for the whole or any part of the System.

**Instructor Facilities**

A device or system which gives certain NGC Transmission Control Centre instructions with an audible or visible alarm, and incorporates the means to return message acknowledgements to the NGC Transmission Control Centre.

**Integral Equipment Test or IET**

A test on equipment, associated with Plant and/or Apparatus, which takes place when that Plant and/or Apparatus forms part of a Synchronised System and which, in the reasonable judgement of the person wishing to perform the test, may cause an Operational Effect.

**Interconnection Agreement**

An agreement made between NGC and an Externally Interconnected System Operator and/or an Interconnector User and/or other relevant persons for the External Interconnection relating to an External Interconnection and/or an agreement under which an Interconnector User can use an External Interconnection.

**Interconnector User**

Has the meaning set out in the BSC.
Interface Agreement  
An agreement between a User and NGC containing provisions for dealing with the consequences of a User owning or operating Plant or Apparatus which is sited on another User's land and/or for the sharing of facilities and/or the provision of services at or near a Connection Site Has the meaning set out in the CUSC.

Intertripping  
(a) The tripping of circuit-breaker(s) by commands initiated from Protection at a remote location independent of the state of the local Protection; or
(b) Operational Intertripping.

Intertrip Apparatus  
Apparatus which performs Intertripping.

IP Turbine Power Fraction  
Ratio of steady state mechanical power delivered by the IP turbine to the total steady state mechanical power delivered by the total steam turbine at Registered Capacity.

Isolating Device  
A device for achieving Isolation.

Isolation  
The disconnection of HV Apparatus (as defined in OC8.1.5.28A.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 retained in safe custody; or

(ii) maintained and/or secured by such other method which must be in accordance with the Local Safety Instructions of NGC or the Safety Rules of the Relevant Transmission Licensee or that User, as the case may be;

(b) an adequate physical separation which must be in accordance with and maintained by the method set out in the Local Safety Instructions of NGC 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 NGC 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 NGC GB Transmission System, and in the case of an Event on the NGC GB 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** in **NGC’s Transmission Area** with a **Registered Capacity** of 100MW or more or a **Power Station in SPT’s Transmission Area with a Registered Capacity** of 30MW or more; or a **Power Station in SHETL’s Transmission Area with a Registered Capacity** of 5MW or more.

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

**Licence Standards**
Those standards set out or referred to in **Special Condition AA2 of the Condition C17 of NGC’s Transmission Licence** and/or **Condition D3 of a Relevant Transmission Licensee’s Transmission Licence**.

**Limited Frequency Sensitive Mode**
A mode whereby the operation of the **Genset** 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** 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.

**Load**
The **Active**, **Reactive** or **Apparent Power**, as the context requires, generated, transmitted or distributed.

**Loaded**
Supplying electrical power to the **System**.

**Load Factor**
The ratio of the actual output of a **Generating Unit** to the possible maximum output of that **Generating Unit**.

**Load Management Block**
A block of **Demand** controlled by a **Supplier** or other party through the means of radio teleswitching or by some other means.

**Local Joint Restoration Plan**
A plan produced under OC9.4.7.11 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**.
Local Safety Instructions

Instructions: For safety co-ordination in England and Wales, instructions on each User Site and NGC Transmission Site, approved by the relevant NGC or User’s manager, setting down the methods of achieving the objectives of NGC’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.

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 NGC 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

In England and Wales a voltage not exceeding 250 volts. In Scotland, a voltage exceeding 50 voltage but not exceeding 1000 volts.

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 a User or NGC, as the case may be, NGC or a Relevant Transmission Licensee to effect any works or to alter the manner of operation of its 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 User or NGC, as the case may be, party in expenditure of more than £10,000.

Maximum Generation Service, MGS

A service utilised by NGC under the Balancing Principles Statement in operating the Total System.

Maximum Generation

An agreement between a User and NGC for the payment by NGC to that User in respect of the provision by such User of a Maximum Generation...
<table>
<thead>
<tr>
<th><strong>Service Agreement</strong></th>
<th><strong>Service.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Medium Power Station</strong></td>
<td>A Power Station in NGC’s Transmission Area with a Registered Capacity of 50MW or more, but less than 100MW; or a Power Station in SPT’s Transmission Area with a Registered Capacity of 5MW or more, but less than 30MW.</td>
</tr>
<tr>
<td><strong>Medium Voltage or MV</strong></td>
<td>In England and Wales a voltage exceeding 250 volts but not exceeding 650 volts.</td>
</tr>
<tr>
<td><strong>Mills</strong></td>
<td>Milling plant which supplies pulverised fuel to the boiler of a coal fired Power Station.</td>
</tr>
<tr>
<td><strong>Minimum Generation</strong></td>
<td>The minimum output (in whole MW) which a Genset can generate under stable operating conditions, as registered with NGC 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.</td>
</tr>
<tr>
<td><strong>Modification</strong></td>
<td>Any actual or proposed replacement, renovation, modification, alteration or construction by or on behalf of a User or NGC to either that User’s Plant or Apparatus or NGC’s Transmission Plant or Apparatus, as the case may be, or the manner of its operation which has or may have a Material Effect on NGC or a User, as the case may be, at a particular Connection Site.</td>
</tr>
<tr>
<td><strong>Mothballed Generating Unit</strong></td>
<td>A Generating Unit that has previously generated which the Generator plans not to use to generate for the remainder of the current NGC Financial Year but which could be returned to service.</td>
</tr>
<tr>
<td><strong>Multiple Point of Connection</strong></td>
<td>A double (or more) Point of Connection, being two (or more) Points of Connection interconnected to each other through the User’s System.</td>
</tr>
</tbody>
</table>
| **National Demand** | The amount of electricity supplied from the Grid Supply Points plus:-
| | • that supplied by Embedded Large Power Stations, and |
| | • NGC Transmission Losses; |
| | minus:-
| | • the Demand taken by Station Transformers and Pumped Storage Units; |
| | and, for the purposes of this definition, does not include:-
| | • any exports from the NGC Transmission System across External Interconnections. |
| **Network Data** | The data to be provided by **NGC** to **Users** in accordance with the **PC**, as listed in Part 3 of the Appendix to the **PC**. |
| **Network Operator** | A person with a **User System** directly connected to the **NGCGB 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**. |
| **NGC** | **National Grid Company plc.** |
| **NGC Control Engineer** | The nominated person employed by **NGC** to direct the operation of the **NGCGB Transmission System** or such person as nominated by **NGC**. |
| **NGC Demand** | The amount of electricity supplied from the **Grid Supply Points** plus:  
- that supplied by **Embedded Large Power Stations**, and  
- exports from the **NGC Transmission System** across **External Interconnections**, and  
- **NGC Transmission Losses**,  
and, for the purposes of this definition, includes:  
- the **Demand** taken by **Station Transformers** and **Pumped Storage Units**. |
| **NGC Financial Year** | Bears the meaning given in Supplementary Standard Condition 1 (Definitions and Interpretation) of the **Transmission Licence**. |
| **NGC Operational Strategy** | **NGC’s** operational procedures which form the guidelines for operation of the **NGCGB Transmission System**. |
| **NGC Site** | Means a site owned (or occupied pursuant to a lease, licence or other agreement) by **NGC** in which there is a **Connection Point**. For the avoidance of doubt, a site owned by a **User** but occupied by **NGC** as aforesaid, is an **NGC Site**. |
| **NGC System Warning** | A warning issued by **NGC** 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 |
**NGC System Warning - Demand Control Imminent**
A warning issued by NGC, 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 NGC within 30 minutes.

**NGC System Warning - High Risk of Demand Reduction**
A warning issued by NGC, 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.

**NGC System Warning - Inadequate System Margin**
A warning issued by NGC, 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.

**NGC System Warning - Risk of System Disturbance**
A warning issued by NGC, 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.

**NGC Transmission System**
The system consisting (wholly or mainly) of high voltage electric lines owned or operated by NGC and used for the transmission of electricity from one Power Station to a sub-station or to another Power Station or between sub-stations or to or from any External Interconnection, and includes any Plant and Apparatus and meters owned or operated by NGC in connection with the transmission of electricity but does not include any Remote Transmission Assets.

**NGC Transmission System Losses**
The losses of electricity incurred on the NGC Transmission System.

**NGC Transmission System Study Network Data File**
A computer file containing details of transmission plant and Large Power Stations and the configuration of the connection between them, together with data on Demand, on the NGC Transmission System, the Scottish External Interconnections and the Scottish External System. These details, when read together as represented in the file, form NGC's view of an appropriate representation of the NGC Transmission System, Scottish External Interconnection and Scottish External System, for technical analysis purposes only. The file will only deal with the NGC Transmission System, the Scottish External Interconnections and aspects of the Scottish External Systems' transmission system. For the purposes of this definition, the phrase "External Systems" shall include the transmission system of Scottish and Southern Energy plc.

**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].

**Non-Embedded Customer**
A Customer in England and Wales Great Britain, except for a Network Operator acting in its capacity as such, receiving electricity direct from the
**NGC GB Transmission System** irrespective of from whom it is supplied.

**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.

**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 GB Transmission System or the System of NGC or 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 and System to Demand intertripping schemes.

**Operational Planning**
Planning through various timescales the matching of generation output with forecast NGCGB 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 NGCGB Transmission System and of parts of User Systems to which Power Stations and/or Customers are connected, carried out to achieve, so far as possible, the standards of security set out in the NGC’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 NGC.

**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 NGC Control Engineer and User Responsible Engineer/Operator.

**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**
That portion of Registered Capacity which is not unavailable due to a Planned Outage or breakdown.

**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** which is **Loaded** but is not running at its Maximum Export Limit.

**Permit for Work for proximity work**  
In England and Wales, a document issued by **NGC** or a **User** in accordance with its respective **Safety Rules** to enable work to be carried out in accordance with **OC8.8A.8** and which provides for **Safety Precautions** to be applied and maintained. An example format of NGC’s permit for work is attached as Appendix E to **OC8.8A**.

In Scotland, a document issued by a **Relevant Transmission Licensee** or a **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 the **Relevant Transmission Licensees’** permits for work are attached as Appendix E to **OC8B**.

**Partial Shutdown**  
The same as a **Total Shutdown** except that all generation has ceased in a separate part of the **Total System** and there is no electricity supply from **External Interconnections** or other parts of the **Total System** to that part of the **Total System** and, therefore, that part of the **Total System** is shutdown, with the result that it is not possible for that part of the **Total System** to begin to function again without **NGC**’s directions relating to a **Black Start**.

**Phase (Voltage) Unbalance**  
The ratio (in percent) between the rms values of the negative sequence component and the positive sequence component of the voltage.

**Physical Notification**  
Data that describes the **BM Participant**’s best estimate of the expected input or output of **Active Power** of a **BM Unit**.

**Planning Code or PC**  
That portion of the **Grid Code** which is identified as the **Planning Code**.

**Planned Maintenance Outage**  
An outage of the **NGC** electronic data communication facilities as provided for in **CC.6.5.8** and **NGC**’s associated computer facilities of which normally at least 5 days notice has been given by **NGC** 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 **NGC** to the **User**. It is anticipated that normally any planned outage would only last around one hour.

**Planned Outage**  
An outage of a **Large Power Station** or of part of the **NGC GB Transmission System**, or of part of a **User System**, co-ordinated by **NGC** under **OC2**.

**Plant**  
Fixed and movable items used in the generation and/or supply and/or transmission of electricity, other than **Apparatus**.

**Point of Common**  
That point on the **NGC GB Transmission System** electrically nearest to
### Coupling
- the **User** installation at which either **Demands** or **Loads** are, or may be, connected.

### Point of Connection
- An electrical point of connection between the **NGC** Transmission System and a User’s System.

### Point of Isolation
- The point on Apparatus (as defined in **OC8.1.5.28A.1.6.2** and **OC8B.1.7.2**) at which isolation is achieved.

### Post-Control Phase
- The period following real time operation.

### Power Factor
- The ratio of **Active Power** to **Apparent Power**.

### Power Island
- **Gensets** at an isolated **Power Station**, together with complementary local **Demand**.

### Power Station
- An installation comprising one or more Generating Units (even where sited separately) owned and/or controlled by the same Generator, which may reasonably be considered as being managed as one **Power Station**.

### Power System Stabiliser or PSS
- Equipment controlling the Exciter output via the voltage regulator in such a way that power oscillations of the synchronous machines are dampened. Input variables may be speed, frequency or power (or a combination of these).

### Preface
- The preface to the **Grid Code** (which does not form part of the **Grid Code** and therefore is not binding).

### Preliminary Notice
- A notice in writing, sent by NGC both to all **Users** identified by it under **OC12.4.2.1** and to the **Test Proposer**, notifying them of a proposed **System Test**.

### Preliminary Project Planning Data
- Data relating to a proposed **User Development** at the time the **User** applies for a **CUSC Contract** but before an offer is made and accepted.

### Primary Response
- The automatic increase in **Active Power** output of a **Genset** or, as the case may be, the decrease in **Active Power Demand** in response to a **System Frequency** fall. This increase in **Active Power** output or, as the case may be, the decrease in **Active Power Demand** must be in accordance with the provisions of the relevant **Ancillary Services Agreement** which will provide that it will be released increasingly with time over the period 0 to 10 seconds from the time of the start of the **Frequency** fall on the basis set out in the **Ancillary Services Agreement** and fully available by the latter, and sustainable for at least a further 20 seconds. The interpretation of the **Primary Response** to a $-0.5$ Hz frequency change is shown diagrammatically in Figure CC.A.3.2.
**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 NGC 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, and 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, being that output up to which the Generating Unit was designed to operate (Calculated as specified in British Standard BS EN 60034 – 1: 1995).

**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, 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).

(b) In the case of a CCGT Module, the normal full load capacity of a CCGT Module as declared by the Generator, being the Active Power declared by the Generator as being deliverable by the CCGT Module at the Grid Entry Point (or in the case of an Embedded CCGT Module, at the User System Entry Point), expressed in whole MW.

(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. The maximum Active Power deliverable is the maximum amount deliverable simultaneously by the Generating Units and/or CCGT Modules less the MW consumed by the Generating Units and/or CCGT Modules in producing that Active Power.

**Registered Data**

Those items of Standard Planning Data and Detailed Planning Data which upon connection become fixed (subject to any subsequent changes).

**Regulations**

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

**Reheater Time**

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 Transmission Licensee**

Means SP Transmission Ltd (SPT) in its Transmission Area and Scottish Hydro-Electric Transmission Ltd (SHETL) in its Transmission Area.

**Remote Transmission Assets**

Any Plant and Apparatus or meters owned by NGC which:

- are Embedded in a User System and which are not directly connected by Plant and/or Apparatus owned by NGC to a sub-station owned by NGC; and

- are by agreement between NGC and such User operated under the direction and control of such User.

**Requesting Safety Co-ordinator**


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

For Connection Sites in Scotland 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 Network Operator’s User System which have become Out of Synchronism with each other back into Synchronism, and like terms shall be construed accordingly.

**Safety Co-ordinator**

A person or persons nominated by NGC and each User in relation to Connection Points in England and Wales and/or by the Relevant Transmission Licensee and each User in relation to Connection Points in Scotland 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 OC8.1.5.2A.1.6.2 and OC8B.1.7.2), pursuant to OC8.

**Safety From The System**

That condition which safeguards persons when work is to be carried out on or near a System from the dangers which are inherent in the System.

**Safety Key**

A key unique at the Location capable of operating a lock which will cause
an **Isolating Device** and/or **Earthing Device** to be **Locked**.

**Safety Log**
A chronological record of messages relating to safety co-ordination sent and received by each **Safety Co-ordinator** under **OC8**.

**Safety Precautions**
**Isolation** and/or **Earthing**.

**Safety Rules**
The rules of **NGC** *(in England and Wales)* and the **Relevant Transmission Licensee** *(in Scotland)* or a **User** that seek to ensure that persons working on **Plant** and/or **Apparatus** to which the rules apply are safeguarded from hazards arising from the **System**.

**Secondary Response**
The automatic increase in **Active Power** output of a **Genset** or, as the case may be, the decrease in **Active Power Demand** in response to a **System Frequency** fall. This increase in **Active Power** output or, as the case may be, the decrease in **Active Power Demand** must be in accordance with the provisions of the relevant **Ancillary Services Agreement** which will provide that it will be fully available by 30 seconds from the time of the start of the **Frequency** fall and be sustainable for at least a further 30 minutes. The interpretation of the **Secondary Response** to a -0.5 Hz frequency change is shown diagrammatically in Figure CC.A.3.2.

**Secretary of State**
Has the same meaning as in the **Act**.

**Settlement Period**
A period of 30 minutes ending on the hour and half-hour in each hour during a day.

**Seven Year Statement**
A statement, prepared by **NGC** in accordance with the terms of the **NGC’s Transmission Licence**, showing for each of the seven succeeding **NGC Financial Years**, the opportunities available for connecting to and using the **NGCGB Transmission System** and indicating those parts of the **NGCGB Transmission System** most suited to new connections and transport of further quantities of electricity.

**SF₆ Gas Zone**
A segregated zone surrounding electrical conductors within a casing containing SF₆ gas.

**SHETL**
**Scottish Hydro-Electric Transmission Limited**

**Shutdown**
The condition of a **Generating Unit** where the generator rotor is at rest or on barring.

**Significant Incident**
An **Event** which either:

a) was notified by a **User** to **NGC** under **OC7**, and which **NGC** considers has had or may have had a significant effect on the **NGCGB Transmission System**, and **NGC** requires the **User** to report that
**Simultaneous Tap Change**

A tap change implemented on the generator step-up transformers of **Synchronised Gensets**, effected by **Generators** in response to an instruction from **NGC** 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 **NGC** of the instruction.

**Single Line Diagram**

A schematic representation of a three-phase network in which the three phases are represented by single lines. The diagram shall include (but not necessarily be limited to) busbars, overhead lines, underground cables, power transformers and reactive compensation equipment. It shall also show where **Large Power Stations** are connected, and the points at which **Demand** is supplied.

**Single Point of Connection**

A single **Point of Connection**, with no interconnection through the **User**’s **System** to another **Point of Connection**.

**Site Common Drawings**

Drawings prepared for each **Connection Site** which incorporate **Connection Site** layout drawings, electrical layout drawings, common protection/control drawings and common services drawings.

**Site Responsibility Schedule**

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

**Small Power Station**

A **Power Station** in **NGC’s Transmission Area** with a **Registered Capacity** of less than 50MW, or a **Power Station** in **SPT’s** or **SHETL’s Transmission Area**, with a **Registered Capacity** of less than 5 MW.

**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 **NGC** under the **PC**. It is generally also the data which **NGC** requires from a new **User** in an application for a **CUSC Contract**, as reflected in the **PC**.
**Start Time**
The time named as such in an instruction issued by NGC pursuant to the BCs.

**Start-Up**
The action of bringing a Generating Unit from Shutdown to Synchronous Speed.

**Statement of Readiness**
Has the meaning set out in the Bilateral Agreement and/or Construction Agreement.

**Station Board**
A switchboard through which electrical power is supplied to the Auxiliaries of a Power Station, and which is supplied by a Station Transformer. It may be interconnected with a Unit Board.

**Station Transformer**
A transformer supplying electrical power to the Auxiliaries of a Power Station, which is not directly connected to the Generating Unit terminals (typical voltage ratios being 132/11kV or 275/11kV).

**STC Committee**
The committee established under the STC.

**Steam Unit**
A Generating Unit whose prime mover converts the heat-energy in steam to mechanical energy.

**Subtransmission System**
The part of a User’s System which operates at a single transformation below a Supergrid Voltage the voltage of the relevant Transmission System.

**Supergrid Voltage**
Any voltage greater than 200kV.

**Supplier**
(a) A person supplying electricity under an Electricity Supply Licence; or

(b) A person supplying electricity under exemption under the Act; in each case acting in its capacity as a supplier of electricity to Customers in England and Wales, Great Britain.
**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 **NGC GB 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 **System** is connected to the busbars of another **System** so that the **Frequencies** and phase relationships of that **Generating Unit** or **System**, as the case may be, and the **System** to which it is connected are identical, like terms shall be construed accordingly.

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.

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**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 Speed**

That speed required by a **Generating Unit** to enable it to be **Synchronised** to a **System**.

---

**System**

Any **User System** and/or the **NGC GB Transmission System**, as the case may be.

---

**System Ancillary Services**

Collectively **Part 1 System Ancillary Services** and **Part 2 System Ancillary Services**.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<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 not available due to a System Constraint.</td>
</tr>
<tr>
<td><strong>System Constraint Group</strong></td>
<td>A part of the NGCGB 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>
<tr>
<td><strong>System Fault Dependability Index or Dp</strong></td>
<td>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 F₁ = Number of System faults where there was a failure to trip a circuit-breaker.</td>
</tr>
<tr>
<td><strong>System Margin</strong></td>
<td>The margin in any period between (a) the sum of Maximum Export Limits and (b) forecast Demand and the Operating Margin, for that period.</td>
</tr>
<tr>
<td><strong>System Negative Reserve Active Power Margin or System NRAPM</strong></td>
<td>That margin of Active Power sufficient to allow the largest loss of Load at any time.</td>
</tr>
<tr>
<td><strong>System Operator - Transmission Owner Code or STC</strong></td>
<td>Has the meaning set out in NGC’s Transmission Licence</td>
</tr>
<tr>
<td><strong>System Tests</strong></td>
<td>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.</td>
</tr>
<tr>
<td><strong>System to Demand Intertrip Scheme</strong></td>
<td>An intertrip scheme which disconnects Demand when a System fault has arisen to prevent abnormal conditions occurring on the System.</td>
</tr>
<tr>
<td><strong>System Zone</strong></td>
<td>A region of the NGCGB Transmission System within a described boundary or the whole of the NGCGB Transmission System, as further provided for in OC2.2.4, and the term &quot;Zonal&quot; will be construed</td>
</tr>
</tbody>
</table>
accordingly.

**Target Frequency**

That **Frequency** determined by **NGC**, 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 **NGC**, 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**.

**Test Panel**

A panel, whose composition is detailed in **OC12**, which is responsible, inter alia, for considering a proposed **System Test**, and submitting a **Proposal Report** and a **Test Programme**.

**Test Programme**

A programme submitted by the **Test Panel** to **NGC**, the **Test Proposer**, and each **User** identified by **NGC** under **OC12.4.2.1**, which states the switching sequence and proposed timings of the switching sequence, a list of those staff involved in carrying out the **System Test** (including those responsible for the site safety) and such other matters as the **Test Panel** deems appropriate.

**Test Proposer**

The person who submits a **Proposal Notice**.

**Total Shutdown**

The situation existing when all generation has ceased and there is no electricity supply from **External Interconnections** and, therefore, the **Total System** has shutdown with the result that it is not possible for the **Total System** to begin to function again without **NGC**’s directions relating to a **Black Start**.

**Total System**

The **NGC GB Transmission System** and all **User Systems** in **England and Wales**. **Great Britain**.

**Trading Point**

A commercial and, where so specified in the **Grid Code**, an operational interface between a **User** and **NGC**, which a **User** has notified to **NGC**.

**Transfer Date**

Such date as may be appointed by the **Secretary of State** by order under section 65 of the **Act**.
<table>
<thead>
<tr>
<th>Term</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Transmission</td>
<td>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 GB Transmission System, and not of or with the User System.</td>
</tr>
<tr>
<td>Transmission Area</td>
<td>Has the meaning set out in the Transmission Licence of a Transmission Licensee.</td>
</tr>
<tr>
<td>Transmission Entry Capacity</td>
<td>Has the meaning set out in the CUSC.</td>
</tr>
<tr>
<td>Transmission Licence</td>
<td>The licence granted under Section 6(1)(b) of the Act.</td>
</tr>
<tr>
<td>Transmission Licensee</td>
<td>Means the holder for the time being of a Transmission Licence.</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 NGC in which there is a Connection Point. For the avoidance of doubt, a site owned by a User but occupied by NGC as aforesaid, is a Transmission Site.</td>
</tr>
<tr>
<td></td>
<td>In Scotland, means a site owned (or occupied pursuant to a lease, licence or other agreement) by a Relevant Transmission Licensee in which there is a Connection Point. For the avoidance of doubt, a site owned by a User but occupied by the Relevant Transmission Licensee as aforesaid, is a Transmission Site.</td>
</tr>
<tr>
<td>Transmission System</td>
<td>Has the same meaning as the term &quot;licensee's transmission system&quot; in the Transmission Licence of a Transmission Licensee.</td>
</tr>
<tr>
<td>Turbine Time Constant</td>
<td>Determined at Registered Capacity, 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 Operational Day that a Genset may De-Synchronise.</td>
</tr>
<tr>
<td>Unbalanced Load</td>
<td>The situation where the Load on each phase is not equal.</td>
</tr>
<tr>
<td>Under-excitation Limiter</td>
<td>Shall have the meaning ascribed to that term in IEC 34-16-1:1991 [equivalent to British Standard BS4999 Section 116.1 : 1992].</td>
</tr>
<tr>
<td>Under Frequency Relay</td>
<td>An electrical measuring relay intended to operate when its characteristic quantity (Frequency) reaches the relay settings by decrease in Frequency.</td>
</tr>
</tbody>
</table>
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 **NGCGB 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 **NGCGB Transmission System**, or a **Modification** relating to a **User’s Plant** and/or **Apparatus** already connected to the **NGCGB 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 **NGC** but occupied by a **User** as aforesaid, is a **User Site**.

**In Scotland, 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;

**to the NGCGB Transmission System** or to the relevant other **User System**, as the case may be.
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 **NGC GB Transmission System**.

**User System Entry Point**

A point at which a **Generating Unit**, a **CCGT Module** or a **CCGT Unit**, 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 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 NGC'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
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.

< 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 NGC in the planning and development of the NGC GB 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 NGC, and certain information to be supplied by NGC to Users. In Scotland, NGC has obligations under the STC to inform Relevant Transmission Licensees of data required for the planning of the GB Transmission System. NGC may pass on User data to a Relevant Transmission Licensee where it is required to do so under the STC. User information that NGC is required by the STC to provide to a Relevant Transmission Licensee is identified in this Planning Code and the Data Registration Code.

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 NGC GB 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 NGC GB Transmission System;

(b) the introduction of a new Connection Site or the Modification of an existing Connection Site between a User System and the NGC GB 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 NGC GB Transmission System may involve work:

(a) at a substation at a Connection Site where User's Plant and/or Apparatus is connected to the NGC GB Transmission System;

(b) on transmission lines or other facilities which join that Connection Site to the remainder of the NGC GB 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 NGC GB 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 NGC GB Transmission System.
PC.2  OBJECTIVE

PC.2.1 The objectives of the PC are:

(a) to promote NGC/User interaction in respect of any proposed development on the User System which may impact on the performance of the NGC GB Transmission System or the direct connection with the NGC GB Transmission System;

(b) to provide for the supply of information required by NGC from Users in order for NGC to undertake the planning and development of the NGC GB Transmission System in accordance with the relevant Licence Standards, to facilitate existing and proposed connections, and also to provide for the supply of certain information from NGC to Users in relation to short circuit current contributions; and

(c) to specify the Licence Standards which will be used by NGC in the planning and development of the NGC GB Transmission System; and

(d) to provide for the supply of information required by NGC from Users in respect of the following to enable NGC 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.

NGC 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, NGC may publish the information. Where it is known by NGC 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

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

(a) Generators;

(b) Network Operators; and

(c) Non-Embedded Customers.

The above categories of User will become bound by the PC prior to them generating, operating or consuming, 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, 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 NGC in respect of Embedded Large Power Stations and Embedded Medium Power Stations;

(b) although data is not normally required specifically on Embedded Small Power Stations under this PC, each Network Operator in whose System they are Embedded should provide the data (contained in the Appendix) to NGC in respect of Embedded Small Power Stations 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 NGC 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, as provided in PC.A.1.12.

PC.4 PLANNING PROCEDURES

PC.4.1 Pursuant to Supplementary Standard Condition C7G C11 of the NGC’s Transmission Licence, the means by which Users and proposed Users of the NGCGB Transmission System are able to assess opportunities for connecting to, and using, the NGCGB Transmission System comprise two distinct parts, namely:

(a) a statement, prepared by NGC under its Transmission Licence, showing for each of the seven succeeding NGC Financial Years, the opportunities available for connecting to and using the NGCGB Transmission System and indicating those parts of the NGCGB 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 NGC to enter into a CUSC Contract for connection to (or, in the case of Embedded Large Power Stations and Embedded Medium Power Stations, use of) the NGCGB Transmission System. A Bilateral Agreement is to be entered into for every Connection Site (and for certain Embedded Power Stations, as explained above) 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 detailed above) as at the **Transfer Date**;

(ii) new **Connection Sites** (and for certain **Embedded Power Stations**, as detailed above) with effect from the **Transfer Date**;

(iii) a **Modification** at a **Connection Site** (or in relation to the connection of certain **Embedded Power Stations**, as detailed above) (whether such **Connection Site** or connection exist on the **Transfer Date** or are new thereafter) with effect from the **Transfer Date**.

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

**PC.4.2** Introduction to Data

**User Data**

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

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

(b) **Detailed Planning Data**,

as more particularly provided in **PC.A.1.4**.

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

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

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

(c) **Connected Planning Data**,

as more particularly provided in **PC.5**

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

(a) **Forecast Data**;

(b) **Registered Data**; and

(c) **Estimated Registered Data**,

as more particularly provided in **PC.5.5**

**PC.4.2.4** Clearly, an existing **User** proposing a new **Connection Site** (or **Embedded Power Station**) 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**) 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.

NGC Network Data

In addition, there is Network Data supplied by NGC in relation to short circuit current contributions.

Data Provision

Seven Year Statement

To enable the Seven Year Statement to be prepared, each User is required to submit to NGC (subject to the provisions relating to Embedded Power 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 until calendar week 28) and should cover each of the seven succeeding NGC 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, NGC will also use the Transmission Entry Capacity and Connection Entry Capacity data from the CUSC Contract in the preparation of the Seven Year Statement and to that extent the data will not be treated as confidential.

Network Data

To enable Users to model the NGC GB Transmission System in relation to short circuit current contributions, NGC 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 NGC Financial Year.

Offer of Terms for connection

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 NGC GB Transmission System or of the Modification relating to the User’s Plant and/or Apparatus already connected to the NGC GB 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 NGC 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 NGCGB 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 NGC 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.4.5 Complex connections

PC.4.5.1 The magnitude and complexity of any NGCGB 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 NGC to carry out additional more extensive system studies to evaluate more fully the impact of the proposed User Development on the NGCGB Transmission System. Where NGC 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 NGC 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 NGC to carry out any of the above mentioned necessary detailed system studies, the User may, at the request of NGC, 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 NGC 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. This 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 NGC 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 NGC under this PC, will become Committed
Project Planning Data. This data, together with Connection Entry Capacity
and Transmission Entry Capacity data from the CUSC Contract, and other
data held by NGC relating to the NGC GB Transmission System will form the
background against which new applications by any User will be considered and
against which planning of the NGC GB 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 NGC:

(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 NGC's view, relevant to that other application or possible
application);

(c) is obliged to use it for NGC 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 NGC 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. This data is then termed Connected Planning Data.

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

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

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

(c) those items of Standard Planning Data and Detailed Planning Data which for the purposes of the Plant and/or Apparatus concerned as at the date of submission are Registered Data but which for the seven succeeding NGC 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 NGC relating to the NGC GB Transmission System, will form the background against which new applications by any User will be considered and against which planning of the NGC GB 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 NGC:

(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 NGC's view, relevant to that other application or possible application);

(c) is obliged to use it for NGC-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 NGC shall apply the Licence Standards relevant to planning and development, in the planning and development of its Transmission System. NGC shall procure that each Relevant Transmission Licensee shall apply the Licence Standards relevant to planning and development, in the planning and development of the NGC 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 NGC on request. NGC will charge an amount sufficient to recover its reasonable costs incurred in providing this service.
APPENDIX A

PLANNING DATA REQUIREMENTS

PC.A.1. INTRODUCTION

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

Submissions by Users

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

(i) with respect to each of the seven succeeding NGC 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); and

(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 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.

(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 NGC under the PC, notwithstanding that the change may subsequently be notified to NGC 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, notify NGC 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 (except as provided in
PC.3.2.(b)), or unless specifically requested by NGC, or unless otherwise specifically provided.

PC.A.1.3 Submissions by NGC

Network Data release by NGC shall be:

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

(b) provided by NGC 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, NGC 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. It comprises data which is expected normally to be sufficient for NGC to investigate the impact on the NGCGB Transmission System of any User 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).

(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 NGC may agree in any particular case) of the offer for a CUSC Contract, being accepted by the User. It comprises additional, more detailed, data not normally expected to be required by NGC to investigate the impact on the NGCGB Transmission System of any User Development associated with an application by the User for a CUSC Contract. Users should note that, although not needed within 28 days of the offer, 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 NGC to provide the Detailed Planning Data in advance of the normal timescale before NGC can make an offer for a CUSC Contract, as explained in PC.4.5.

(c) NGC Network Data

The data requirements for NGC in this Appendix are in Part 3.

Forecast Data, Registered Data and Estimated Registered Data
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.

The following paragraphs in this Appendix relate to Forecast Data:

3.2.2(b) and (h)  
4.2.1  
4.3.1  
4.3.2  
4.3.3  
4.3.4  
4.3.5  
4.5(a)(ii) and (b)(ii)  
4.7.1  
5.2.1  
5.2.2  
5.5.1

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  
3.2.2(a), (c), (d), (e), (f) and (g)  
3.4.1  
3.4.2  
4.2.3  
4.5(a)(i), (a)(iii), (b)(i) and (b)(iii)  
4.6  
5.3.2  
5.4  
5.5.3  
6.2  
6.3

The data supplied under PC.A.3.3.1, although in the nature of Registered Data, is only supplied upon application for a CUSC Contract, 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.
PC.A.1.10 **Registered Data** must contain validated actual values, parameters or other information (as the case may be) which replace the estimated values, parameters or other information (as the case may be) which were given in relation to those data items when they were Preliminary Project Planning Data and Committed Project Planning Data, or in the case of changes, which replace earlier actual values, parameters or other information (as the case may be). Until amended pursuant to the Grid Code, these actual values, parameters or other information (as the case may be) will be the basis upon which NGC the GB Transmission System is planned, designed, built and operated, the NGC Transmission System in accordance with, amongst other things, the Transmission Licences, the STC and the Grid Code, and on which NGC therefore relies. In following the processes set out in the BCs, NGC 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.

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

PC.A.1.12 Certain data does not need to be supplied in relation to Embedded Power Stations where these are connected at a voltage level below the voltage level directly connected to the NGC GB Transmission System except in connection with a CUSC Contract, or unless specifically requested by NGC.
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 NGCGB Transmission System, or seeking such a direct connection, shall provide NGC 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 NGCGB Transmission System. Such data, current and forecast, is specified in PC.A.2.2 to PC.A.2.5. In addition each Generator with Embedded Large Power Stations or Embedded Medium Power Stations connected to the Subtransmission System, shall provide NGC with fault infeed data as specified in PC.A.2.5.5.

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 or Medium Power Station in its User System may, at NGC’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 or Medium Power Station.

PC.A.2.1.4 At NGC’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 (two examples are shown in Appendix B) must include all parts of the User System operating at Supergrid Voltage throughout Great Britain and, in Scotland, also all parts of the User System operating at 132kV, and those parts of its Subtransmission System at any NGCTransmission 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, 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 connected to the User’s Subtransmission System, to a Connection 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 NGC’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 must include the points at which Demand data (provided under PC.A.4.3.4) 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, 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)

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
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, 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 Connection Site which is owned, operated or managed by NGC: 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 owned operated by NGC and connected to the User's System at 132kV and above in England and Wales and 33kV and above in Scotland, other than power factor correction equipment associated directly with Customers' Plant and Apparatus, the following information is required:

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

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

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

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

PC.A.2.5 Short Circuit Contribution to NGCC GR Transmission System

PC.A.2.5.1 General

(a) To allow NGC 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 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) NGC 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 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 NGC are close to the equipment rating, and in NGC’s reasonable opinion more accurate calculations of the prospective short circuit currents are required, then NGC 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

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 Embedded Medium Power Stations 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.2.5.5 Data from Generators

PC.A.2.5.5.1 For each Generating Unit with one or more associated Unit Transformers, the Generator 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 NGC GB 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 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 Gensets are Synchronised to the System. Where there is an alternative running arrangement 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.2.5.6 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, 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 if appropriate) if substantially different from the values of positive sequence resistance and reactance which would be derived from the data provided above.

(b) In considering this data, unless the **User** notifies **NGC** accordingly at the time of data submission, **NGC** 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 **NGC** 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 DATA

PC.A.3.1 Introduction

Directly Connected

PC.A.3.1.1 Each Generator with an existing, or proposed, Power Station directly connected, or to be directly connected, to the NGC GB Transmission System, shall provide NGC with data relating to that Power 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 with an existing, or proposed, Embedded Large Power Station and/or an Embedded Medium Power Station connected to the Sub Transmission System, shall provide NGC with data relating to that Power 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, 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 NGC under PC.A.3.1.4.

PC.A.3.1.3 (a) Each Network Operator shall provide NGC with the data specified in PC.A.3.2.2(c).

(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 Embedded in that Network Operator's System. The Network Operator must inform NGC of the number of such Embedded Power Stations (including the number of Generating Units) 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 NGC's reasonable discretion, to provide details of Embedded Small Power Stations and Embedded Medium Power Stations and Customer Generating Plant, both current and forecast, as specified in PC.A.3.2 to PC.A.3.4. Such requirement would arise where NGC reasonably considers that the collective effect of a number of such Embedded Power Stations and
Customer Generating Plants may have a significant system effect on the NGC GB Transmission System.

PC.A.3.1.5 Where Generating Units, which term includes CCGT Units, are connected to the NGC GB 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 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 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).

(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 of each Embedded Small Power Station and Embedded Medium Power Station (although (a) is not required for CCGT Units).

(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 NGC 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;
Items (a), (b), (d), (e), (f), (g) and (h) are to be supplied by each **Generator** 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) **System Constrained Capacity** (MW) i.e. any constraint placed on the capacity of the **Embedded Generating Unit** due to the **Network Operator's System** in which it is embedded. Where **Generating Units** (which term includes **CCGT Units**) 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** is connected sufficient for NGC to determine where the MW generated by each **Generating Unit** at that **Power Station** would appear onto the **NGC GB Transmission System**;

(d) **Minimum Generation** (MW);

(e) MW obtainable from **Generating Units** in excess of **Registered Capacity**;

(f) **Generator Performance Chart** at the **Generating Unit** stator terminals;

(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 **NGC GB 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** and type of **Generating Unit**, eg. **Steam Unit**, **Gas Turbine Unit**, **Combined Cycle Gas Turbine Unit**, **Novel Units** (specify by type), etc;
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 NGC 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.3.3. Rated Parameters Data

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

(a) for all Generating Units:
   
   Rated MVA
   Rated MW
   Direct axis transient reactance;

(b) for each synchronous Generating Unit:
   
   Short circuit ratio
   Inertia constant (for whole machine), MWsecs/MVA;

(c) for each Generating Unit step-up transformer:
   
   Rated MVA
   Positive sequence reactance (at max, min and nominal tap).

This information should only be given in the data supplied with the application for a CUSC Contract (if appropriate for any variation), as the case may be.

PC.A.3.4 General Generating Unit Data

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

PC.A.3.4.2 (a) Details of the Exciter category, for example whether it is a rotating Exciter or a static Exciter.

(b) Whether a Power System Stabiliser is fitted.
PC.A.4 DEMAND AND ACTIVE ENERGY DATA

PC.A.4.1 Introduction

PC.A.4.1.1 Each User directly connected to the NGCGB Transmission System with Demand shall provide NGC with the Demand data, historic, current and forecast, as specified in PC.A.4.2, PC.A.4.3 and PC.A.4.5. 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.

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

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

PC.A.4.2 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 NGCGB Transmission System;

(b) day of peak NGCGB Transmission System Demand (Active Power) as notified by NGC pursuant to PC.A.4.2.2;

(c) day of minimum NGCGB Transmission System Demand (Active Power) as notified by NGC pursuant to PC.A.4.2.2.

In addition, the total Demand (Active Power) in respect of the time of peak NGCGB Transmission System Demand in the preceding NGC-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 NGC shall notify each Network Operator and Non-Embedded Customer in writing of the following, for the current NGC Financial Year and for each of the following seven NGC 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 NGC GB Transmission System Demand;

b) the date and time of the annual minimum of the NGC GB Transmission System Demand.

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 NGC Financial Year, both outturn and weather corrected, together with a prediction for the current financial year, is required. Each Active Energy submission shall be subdivided into the following categories of Customer tariff:

- LV1
- LV2
- LV3
- HV
- EHV
- Traction
- Lighting

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

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

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

(b) in the case of PC.A.4.2.1(a), (b) and (c), be that remaining after any deductions reasonably considered appropriate by the User to take account of the output profile of all Embedded Small Power Stations and Embedded Medium Power Stations and Customer Generating Plant and imports across Embedded External Interconnections;

(c) in the case of PC.A.4.2.1(a) and (b), be based on Annual ACS Conditions and in the case of PC.A.4.2.1(c) and the details of the annual Active Energy required under PC.A.4.2.3 be based on Average Conditions.

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 are 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 NGC GB Transmission System;

(b) the time of peak NGC GB Transmission System Demand as provided by NGC under PC.A.4.2.2;

(c) the time of minimum NGC GB Transmission System Demand as provided by NGC under PC.A.4.2.2.

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 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) in the case of PC.A.4.3.1(a) and (b) be based on Annual ACS Conditions and in the case of PC.A.4.3.1(c) be based on Average Conditions.

PC.A.4.3.3 Where two or more Connection Points normally run in parallel with the NGC GB Transmission System under intact network conditions, and a Single Line Diagram of the interconnection has been provided under PC.A.2.2.2, the User may provide a single submission covering the aggregate Demand for all such Connection Points.

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 NGC GB 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 So that NGC is able to assess the impact on the NGC GB Transmission System of the diversified NGC GB Transmission System Demand at various periods throughout the year, each User shall provide additional forecast Demand data as specified in PC.A.4.3.1 and PC.A.4.3.2 but with
respect to times to be specified by NGC. However, NGC shall not make such a request for additional data more than once in any calendar year.

PC.A.4.4 NGC 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. and PC.A.4.3.4 above into a cohesive forecast and will use this in preparing Forecast Demand information in the Seven Year Statement and for use in NGC'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 NGC to explain its concerns and may require NGC, on reasonable request, to discuss these forecasts. In the absence of such expressions, NGC will assume that Users concur with NGC's cohesive forecast.

Demand Transfer Capability

PC.A.4.5 Where a User's Demand or group of Demands (Active and Reactive Power) may be offered by the User to be supplied from alternative Connection Point(s), (either through non-NGCTransmission interconnections or through Demand transfer facilities) and the User reasonably considers it appropriate that this should be taken into account (by NGC) in designing the Connection Site the following information is required:

(a) First Circuit (Fault) Outage Conditions

(i) the alternative Connection Point(s);

(ii) the Demand (Active and Reactive Power) which may be transferred under the loss of the most critical circuit from or to each alternative Connection Point (to the nearest 5MW/5Mvar);

(iii) the arrangements (eg. manual or automatic) for transfer together with the time required to effect the transfer.

(b) Second Circuit (Planned) Outage Conditions

(i) the alternative Connection Point(s);

(ii) the Demand (Active and Reactive Power) which may be transferred under the loss of the most critical circuit from or to each alternative Connection Point (to the nearest 5MW/5Mvar);

(iii) the arrangements (eg. manual or automatic) for transfer together with the time required to effect the transfer.

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

- Magnitude of Demand or pumping load which is tripped
- **System Frequency** at which tripping is initiated \( \text{Hz} \)
- Time duration of **System Frequency** below trip setting for tripping to be initiated \( \text{s} \)
- Time delay from trip initiation to tripping \( \text{s} \)

**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 NGC:

(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 \( \text{NGCGB} \) 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 \( \text{NGCGB} \) Transmission System;

(e) the maximum harmonic content which the **User** would expect its **Demand** to impose on the \( \text{NGCGB} \) 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 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 NGCGB Transmission System, shall provide NGC with data relating to that Plant and Apparatus, both current and forecast, as specified in PC.A.5.2 and PC.A.5.3.

Embedded

PC.A.5.1.2 Each Generator, with existing or proposed Embedded Large Power Stations and Embedded Medium Power Stations shall provide NGC with data relating to each of those Large Power Stations and/or Medium Power Stations, both current and forecast, as specified in PC.A.5.2 and PC.A.5.3. However, no data need be supplied in relation to those Embedded Medium Power 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 NGC 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 in that User's System. In such cases (PC.A.3.1.4 also refers), the Network Operator must inform NGC of the number of such Power Stations (including the number of Generating Units) together with their summated capacity. On receipt of this data, the Network Operator or Generator (if the data relates to Power Stations referred to in PC.A.5.1.2) may be further required at NGC's discretion to provide details of Embedded Small Power Stations and Embedded Medium Power Stations and Customer Generating Plant, both current and forecast, as specified in PC.A.5.2 and PC.A.5.3. Such requirement would arise when NGC reasonably considers that the collective effect of a number of such Embedded Small Power Stations and Embedded Medium Power Stations and Customer Generating Plants may have a significant system effect on the NGCGB 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** has associated **Demand** additional to the unit-supplied **Demand** of PC.A.5.2.1 which is supplied from either the **NGC GB Transmission System** or the **Generator's User System** the **Generator** shall supply forecasts for each **Power Station** of:

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

b) the **Demand** at the time of the peak **NGC GB Transmission System** **Demand**;

c) the **Demand** at the time of minimum **NGC GB Transmission System** **Demand**.

PC.A.5.2.3 No later than calendar week 17 each year **NGC** shall notify each **Generator** with **Large Power Stations** and/or **Medium Power Stations** in writing of the following, for the current **NGC Financial Year** and for each of the following seven **NGC 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 **NGC GB Transmission System** **Demand** at Annual ACS Conditions;

b) the date and time of the annual minimum of the **NGC GB Transmission System** **Demand** at Average Conditions.

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

PC.A.5.3 Synchronous Machine 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 **Generating Unit** and **Power Station** data should be supplied:

(a) **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 by Generators with respect to Generating Units commissioned after 1st March 1996 and in cases where, for whatever reason, the Generator 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 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 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.

**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.

**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.5.4.1 (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.

[End of Option 1]

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
Where the **Generating Unit** governor does not have a selectable deadband facility, then the actual value of the deadband need only be provided.

(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 **NGC** 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 **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 Genset at a Large Power Stations.

In this PC.A.5.4, 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.

PC.A.5.4.1 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:

- MLP1  Designed Minimum Operating Level
- MLP2  Minimum Generation
- MLP3  70% of Registered Capacity
- MLP4  80% of Registered Capacity
- MLP5  95% of Registered Capacity
- MLP6  Registered Capacity

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.5.4.2 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.5.4.3 High Frequency Response to Frequency rise

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

PC.A.5.5 Mothballed Generating Unit and Alternative Fuel Information

Data identified under this section PC.A.5.5 must be submitted as required under PC.A.1.2 and at NGC’s reasonable request.

PC.A.5.5.1 Mothballed Generating Unit Information

Generators must supply with respect to each Mothballed Generating Unit 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.5.5.2 **Generators** must also notify NGC of any significant factors which may prevent the Mothballed Generating Unit achieving the estimated values provided under PC.A.5.5.1 above, excluding factors relating to Transmission Entry Capacity.

PC.A.5.5.3 **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 NGC 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.5.5.4 **Generators** must also notify NGC of any significant factors and their effects which may prevent the use of alternative fuels achieving the estimated values provided under PC.A.5.5.3 above (e.g. emissions limits, distilled water stocks etc.)
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 NGC GB Transmission System or seeking such a direct connection, shall provide NGC 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 NGC at NGC’s reasonable request. In the event that NGC identifies a reason for requiring this data, NGC shall write to the relevant User(s), requesting the data, and explaining the reasons for the request. If the User(s) wishes, NGC shall also arrange a meeting at which the request for data can be discussed, with the objective of identifying the best way in which NGC’s requirements can be met.

PC.A.6.2  Transient Overvoltage Assessment Data

PC.A.6.2.1  It is occasionally necessary for NGC to undertake transient overvoltage assessments (e.g. capacitor switching transients, switchgear transient recovery voltages, etc). At NGC’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 NGCGB Transmission System without intermediate transformation;

(f) the following data is required on all transformers operating at Supergrid Voltage throughout Great Britain and, in Scotland, 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 NGC 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 NGC 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 having (or intended to have) a circuit breaker at the generator terminal voltage, clearance times for electrical faults within the Generating Unit zone;

(e) the most probable fault clearance time for electrical faults on any part of the User's System directly connected to the NGCGB Transmission System.

PC.A.6.4 Harmonic Studies

PC.A.6.4.1 It is occasionally necessary for NGC to evaluate the production/magnification of harmonic distortion on NGC and User's Systems, especially when NGC is connecting equipment such as capacitor banks. At NGC’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, e.g., 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 **NGC** to undertake detailed voltage assessment studies (e.g., to examine potential voltage instability, voltage control co-ordination or to calculate voltage step changes). At **NGC**'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 NGC are greater than 90% of the equipment rating, and in
NGC’s reasonable opinion more accurate calculations of short-circuit currents
are required, then at NGC’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:

PC.A.6.6.2 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 π
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 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** emerge in future, **NGC** 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 **NGC GB Transmission System**, NGC will provide 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 as an equivalent 132kV source, the data (as at the HV side of the Point of Connection reflecting data given to NGC 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, the equivalent will normally be in the form of a $\pi$ model or extension with a source at each node and a linking impedance. 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) and (viii)

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 NGC will not provide the data items listed under the following parts of PC.A.8.3:-

(a) (vii) and (viii)

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 **NGC GB Transmission System**, ($I_{1\text{"}}$);

(ii) symmetrical three-phase short circuit current from the **NGC GB Transmission System** after the subtransient fault current contribution has substantially decayed, ($I_{1\text{'}}$);

(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 NGC GB 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;

(viii) the corresponding zero sequence impedance values of the ($\pi$) equivalent.

(b) To enable the model to be constructed, NGC 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 132kV parts of the NGC GB Transmission System NGC will provide the appropriate supergrid transformer data.

(e) The positive sequence X/R ratio and the zero sequence impedance value will correspond to the NGC 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 NGC GB 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 NGC GB Transmission System peak, and NGC will, insofar as such request is reasonable, provide the information as soon as reasonably practicable following the request.
Single Line Diagram

The diagrams below show two examples of single line diagrams, showing the detail that should be incorporated in the diagram. The first example is for an **Network Operator** connection, the second for a **Generator** connection.
## PLANNING CODE APPENDIX C
### PART 1 – SHETL’s TECHNICAL AND DESIGN CRITERIA

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## CONNECTION CONDITIONS

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CONNECTION CONDITIONS

CC.1 INTRODUCTION

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 NGC GB Transmission System or Generators (other than in respect of Small Power Stations) connected to or seeking connection to a User's System which is located in England and/or Wales, Great Britain, and the minimum technical, design and operational criteria with which NGC will comply in relation to the part of the NGC GB Transmission System at the Connection Site with Users.

CC.2 OBJECTIVE

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

CC.3 SCOPE

The CC applies to NGC 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; and

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

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.4 PROCEDURE

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

CC.5.1 The provisions relating to connecting to the NGCGB 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) are contained in the CUSC and/or CUSC Contract (or in the relevant application form or offer for a CUSC Contract), 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. References in this CC to the "Bilateral Agreement" and/or "Construction Agreement" shall be deemed to include references to the application form or offer therefor.

CC.5.2 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 NGC/User interface (which, for the purpose of OC8, must be to NGC's satisfaction regarding the procedures for Isolation and Earthing. For User Sites in Scotland NGC will consult the Relevant Transmission Licensee when determining whether the procedures for Isolation and Earthing are satisfactory);

(d) information to enable NGC 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 NGC 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. NGC 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 NGC to prepare Site Common Drawings as described in CC.7; and

(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 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.5.3 As explained in the Bilateral Agreement and/or Construction Agreement, of the list in CC.5.2, items (c), (e), (g), (h), (k) and (km) need not be supplied in respect of Embedded Power Stations, item (i) need not be supplied in respect of Embedded Small Power Stations and Embedded Medium Power Stations and (d) and (j) are only needed in the case where the Embedded Power 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), NGC will provide written confirmation to the User that the Safety Co-ordinators acting on behalf of NGC are authorised and competent pursuant to the requirements of OC8.

CC.6 TECHNICAL, DESIGN AND OPERATIONAL CRITERIA

CC.6.1 NGC GB TRANSMISSION SYSTEM PERFORMANCE CHARACTERISTICS

CC.6.1.1 NGC shall ensure that, subject as provided in the Grid Code, the NGC GB Transmission System complies with the following technical, design and operational criteria in relation to the part of the NGC GB Transmission System at the Connection Site with a User (unless otherwise specified in CC.6) although in relation to operational criteria NGC 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 NGC'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 NGC GB 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:-

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<td>Continuous operation is required</td>
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<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>
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Grid Voltage Variations

CC.6.1.4 Subject as provided below, the voltage on the 400kV part of the NGCGB 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 NGCGB 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 NGCGB 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.

NGC 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 NGCGB Transmission System, and that part of the NGCGB 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 NGCGB 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.

Engineering Recommendation G5/4 contains planning criteria which NGC will apply to the connection of non-linear load to the NGCGB 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 NGCGB Transmission System should remain, in England and Wales, below 1%, and in Scotland, below 2%, unless abnormal conditions prevail.
CC.6.1.6 Under 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 NGC under the Bilateral Agreement. NGC will only agree following a specific assessment of the impact of these levels on NGC 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 NGCGB 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 NGCGB Transmission System or, in NGC’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.6.2 PLANT AND APPARATUS RELATING TO USER/NGC CONNECTION SITE

The following requirements apply to Plant and Apparatus relating to the User/NGC 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, NGC must ensure are complied with in relation to its 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 NGCGB Transmission System and:-

(i) any Generating Unit (other than a CCGT Unit) 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 NGCGB 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, 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 **NGCGB Transmission System** at nominal **System** voltages of below 132kV the earthing requirements and voltage rise conditions will be advised by NGC 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 **User:NGC Connection Point** and which is contained in equipment bays that are within the **NGC Transmission** busbar protection zone at the **User:NGC 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 NGC, 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 NGC to comply with its obligations in relation to the **NGCGB Transmission System** or, in Scotland, also 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 NGC and the relevant User and, in Scotland, 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 NGC and, the relevant User and, in Scotland, also the Relevant Transmission Licensee under their respective Licences.

(b) **NGC 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 NGC in the Bilateral Agreement. NGC shall provide a copy of the list upon request to any User. NGC 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 NGC 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 NGC 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 NGC) or in respect of test premises which do not include a manufacturing facility premises with an accredited certificate in accordance with BS EN 45001.**

**CC.6.2.2 Requirements relating to Generator/NGC Connection Points**

**CC.6.2.2.1(e)** Each connection between a Generating Unit (other than a CCGT Unit) or a CCGT Module User and the NGC GB 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 NGC Transmission circuit breakers at existing and committed Connection Points for future years.

**CC.6.2.2 Requirements at Connection Points that relate to Generators**

**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 and their connections to the NGCGB Transmission System must meet the minimum requirements given below. These are necessary to reduce to a practical minimum the impact on the NGCGB Transmission System of faults on circuits owned by Generators.

CC.6.2.2.2.2 Fault Clearance Times

(a) The fault clearance times for faults on the Generator's equipment directly connected to the NGCGB Transmission System and for faults on the NGCGB Transmission System directly connected to the Generator'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 NGC having faster fault clearance times.

Slower fault clearance times may be specified in accordance with the Bilateral Agreement for faults on the NGCGB Transmission System. Slower fault clearance times for faults on the Generator's equipment may be agreed in accordance with the terms of the Bilateral Agreement but only if System requirements, in NGC'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 shall provide Back-Up Protection. NGC will also provide Back-Up Protection and these Back-Up Protections will be co-ordinated so as to provide Discrimination.

On a Generating Unit connected to the NGCGB Transmission System where only one Main Protection is provided to clear faults on the HV Generator Connections within the required fault clearance time, the Back-Up Protection provided by the Generators 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 Generator Connections. On Generating Units connected to the NGCGB Transmission System at 400 kV and 275 kV where two Main Protections are provided and on Generating Units connected to the NGCGB 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 and 300 ms in Scotland at the minimum infeed for normal operation for faults on the HV Generator Connections.

Generators’ Back-Up Protection will also be required to withstand, without tripping, the loading incurred during the clearance of a fault on the NGCGB Transmission System by breaker fail Protection at 400kV or 275kV or of a fault cleared by Back-Up Protection where the Generator is connected at 132kV and below. This will permit Discrimination between Generator Back-Up Protection and Back-Up Protection provided on the NGCGB Transmission System and other Users’ Systems.
(c) When the Generating Unit is connected to the NGCGB Transmission System at 400kV or 275kV, and in Scotland also at 132kV, and a circuit breaker is provided by the Generator, or NGC, as the case may be, to interrupt fault current interchange with the NGCGB Transmission System, or Generator's System, as the case may be, circuit breaker fail Protection shall be provided by the Generator, or NGC, 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 will install circuit breaker fail Protection equipment in accordance with the requirements of the Bilateral Agreement. The Generator 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 CCGT 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 NGC's reasonable opinion, System requirements dictate, NGC 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 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 itself) may be worked upon or altered by the Generator personnel in the absence of a representative of NGC or in Scotland, a representative of NGC, or written authority from NGC to perform such work or alterations in the absence of a representative of NGC.

CC.6.2.2.5 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 Operator/NGC Operators and Non-Embedded Customers/NGC Connection Points

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 NGC GB 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 NGC GB Transmission System, and for faults on the NGC GB 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 NGC having a faster fault clearance time. Slower fault clearance times may be specified in accordance with the Bilateral Agreement for faults on the NGC GB 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 NGC’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) NGC 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 **NGCGB Transmission System** at 132kV and below, it is normally required that the Back-Up Protection on the **NGCGB Transmission System** shall discriminate with the Network Operator or Non-Embedded Customer's Back-Up Protection.

(iv) For connections with the **NGCGB 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 **NGCGB 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 **NGCGB 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 **NGCGB 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 NGC, as the case may be, to interrupt the interchange of fault current with the **NGCGB 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 NGC, 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**

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

**CC.6.2.3.3 Automatic Switching Equipment**
Where automatic reclosure of NGC 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 NGC 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 NGC or in Scotland, a representative of NGC, or written authority from NGC to perform such work or alterations in the absence of a representative of NGC.

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 (whether directly connected to the NGC GB Transmission System or Embedded) which each Generator must ensure are complied with in relation to its Generating Units, but, in England and Wales, does not apply to Small Power Stations, hydro units and renewable energy plant not designed for Frequency and voltage control. References to Generating Units in this CC.6.3 should be read accordingly.

Plant Performance Requirements

CC.6.3.2 All Generating Units must be capable of supplying rated power output (MW) at any point between the limits 0.85 power factor lagging and 0.95 power factor leading at the Generating Unit terminals. The short circuit ratio of Generating Units shall be not less than 0.5.

CC.6.3.3 Each Generating Unit 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

maintaining its Active Power output at a level not lower than the figure determined by the linear relationship shown in Figure 1 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%.

![Graph showing frequency and active power output](image)

**Figure 1**

**CC.6.3.4** The **Active Power** output under steady state conditions of any **Generating Unit** directly connected to the **NGCGB Transmission System** should not be affected by voltage changes in the normal operating range specified in paragraph CC.6.1.4. 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.

**CC.6.3.5** It is an essential requirement that the **NGCGB 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 NGC** will state in the **Bilateral Agreement** whether or not a **Black Start Capability** is required.

**Control Arrangements**

**CC.6.3.6** Each **Generating Unit** must be capable of contributing to **Frequency** and voltage control by continuous modulation of **Active Power** and **Reactive Power** supplied to the **NGCGB Transmission System** or the **User System** in which it is **Embedded**.

**CC.6.3.7** (a) Each **Generating Unit** must be fitted with a fast acting proportional 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)**. The governor 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;

as at the time when the installation of which it forms part was designed or (in the case of modification or alteration to the 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 **NGC** as:

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

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

(iii) soon as possible prior to any modification or alteration to the governor; and

(b) The speed governor in co-ordination with other control devices must control the **Generating Unit Active Power Output** with stability over the entire operating range of the **Generating Unit**; and

(c) The speed governor must meet the following minimum requirements:

(i) Where a **Generating Unit** becomes isolated from the rest of the **Total System** but is still supplying **Customers**, the speed governor must also be able to control **System Frequency** below 52Hz unless this causes the **Generating Unit** 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;

(ii) the speed governor must be capable of being set so that it operates with an overall speed droop of between 3% and 5%;

(iii) in the case of all **Generating Units** other than the **Steam Unit** within a **CCGT Module** the 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 **NGC** 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) 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, must be capable of meeting the minimum frequency response requirement profile subject to and in accordance with the provisions of Appendix 3.

(f) For the avoidance of doubt, the requirements of Appendix 3 do not apply to **Generating Units** and/or **CCGT Modules** which have a **Completion Date** before 1 January 2001, 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.
CC.6.3.8 (a) A continuously-acting automatic excitation control system is required to provide constant terminal voltage control of the Generating Unit without instability over the entire operating range of the Generating Unit. The requirements for excitation control facilities, including power system stabilisers, where in NGC's view these are necessary for system reasons, will be specified in the Bilateral Agreement. Reference is made to on-load commissioning witnessed by NGC in BC2.11.2.

(b) 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 system they will be disabled unless recorded in the Bilateral Agreement. Operation of such control facilities will be in accordance with the provisions contained in BC2.

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.

Negative Phase Sequence Loadings

CC.6.3.10 In addition to meeting the conditions specified in CC.6.1.5(b), each 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 NGCGB Transmission System or User System 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 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 NGCGB 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 must continue to operate within this Frequency range for at least the periods of time given in CC.6.1.3 unless NGC has agreed to any Frequency-level relays and/or rate-of-change-of-Frequency relays which will trip such Generating Unit within this Frequency range, under the Bilateral Agreement.

CC.6.3.13 Generators will be responsible for protecting all their Generating Units against damage should Frequency excursions outside the range 52Hz to 47Hz ever occur. Should such excursions occur, it is up to the Generator 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.6.4 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 NGCGB 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 NGCGB 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). The Bilateral Agreement will specify the manner in which Demand subject to low Frequency disconnection will be split into discrete MW blocks with associated Low Frequency Relay settings. Technical requirements relating to Low Frequency Relays are listed in Appendix 5.

CC.6.5 COMMUNICATIONS PLANT

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

Control Telephony

CC.6.5.2 Control Telephony is the method by which a User's Responsible Engineer/Operator and NGC 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.6.5.3 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.6.5.4 Where NGC requires Control Telephony, Users are required to use the Control Telephony with NGC in respect of all Connection Points with the NGCGB Transmission System and in respect of all Embedded Large Power Stations. NGC will install Control Telephony at the User's location where the User's telephony equipment is not capable of providing the required facilities or is
otherwise incompatible with the NGC Transmission Control Telephony. Details of and relating to the Control Telephony required are contained in the Bilateral Agreement.

CC.6.5.5 Detailed information on Control Telephony facilities and suitable equipment required for individual User applications will be provided by NGC upon request.

Operational Metering

CC.6.5.6 (a) NGC 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 NGC Transmission SCADA outstation interface equipment as required by NGC in accordance with the terms of the Bilateral Agreement. In addition, in Scotland, in the case of Novel Units utilising wind energy, anemometer readings would be required for any turbine or Cluster of turbines with a total Registered Capacity of 5MW and greater. In the case of a Cluster of wind turbines with a total Registered Capacity of 5MW or greater a single anemometer would suffice.

(b) For the avoidance of doubt, for Active Power and Reactive Power measurements, circuit breaker and disconnector status indications from CCGT Modules at Large Power Stations, the outputs and status indications must each be provided to NGC 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.

Instructor Facilities

CC.6.5.7 The User shall accommodate Instructor Facilities provided by NGC 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 NGC.

(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 NGC, 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 NGC on request and they are listed as Electrical Standards in the Annex to the General Conditions.

Facsimile Machines

CC.6.5.9 Each User and NGC 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 NGC and Network Operators, at the Control Centre(s); and

(c) in the case of Non-Embedded Customers at the Control Point.

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

CC.6.5.10 Busbar Voltage

NGC shall, subject as provided below, provide each Generator at each Grid Entry Point where one of its Large Power Stations is connected with appropriate voltage signals to enable the Generator to obtain the necessary information to synchronise its Gensets to the NGCGB 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 NGC's Transmission Plant and/or Apparatus at the Grid Entry Point, to which the Generator, with NGC'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.

CC.6.6 SYSTEM MONITORING

CC.6.6.1 Monitoring equipment is provided on the NGCGB Transmission System to enable NGC to monitor its power system dynamic performance conditions. Where this monitoring equipment requires voltage and current signals on the Generating Unit circuit from the User, NGC 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 In the absence of agreement between the parties to the contrary, construction, commissioning, control, operation and maintenance responsibilities follow ownership.

CC.7.1 Not used.

CC.7.2 RESPONSIBILITIES FOR SAFETY

CC.7.2.1 Any User entering and working on its Plant and/or Apparatus on an NGC Transmission Site will work to the NGC-Safety Rules of NGC.

In Scotland, 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 NGC.
CC.7.2.2 NGC entering and working on its Transmission Plant and/or Apparatus on a User Site will work to the User’s Safety Rules. For User Sites in Scotland, NGC 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 NGC for permission to work according to that User’s own Safety Rules when working on its Plant and/or Apparatus on NGC Sites (or a Transmission Site) rather than NGC’s, those set out in CC.7.2.1. If NGC is of the opinion that the User’s Safety Rules provide for a level of safety commensurate with that of the NGC’s, it will notify the User, in writing, that, with effect from the date requested by NGC, the User may use its own Safety Rules when working on its Plant and/or Apparatus on NGC Sites, the Transmission Site. For a Transmission Site in Scotland, in forming its opinion, NGC will seek the opinion of the Relevant Transmission Licensee. Until receipt of such written approval from NGC, the User will continue to use the NGC’s Safety Rules, as set out in CC.7.2.1.

CC.7.2.4 In the case of a User Site in England and Wales, NGC may, with a minimum of six weeks notice, apply to a User for permission to work according to NGC’s Safety Rules when working on its Transmission Plant and/or Apparatus on that User’s Site, rather than the User’s Safety Rules. If the User is of the opinion that NGC’s Safety Rules provide for a level of safety commensurate with that of the User’s Safety Rules, it will notify NGC, in writing, that, with effect from the date requested by NGC, NGC 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, NGC shall continue to use the User’s Safety Rules.

CC.7.2.5 If NGC (or a User, as the case may be) For a Transmission Site in England and Wales, if NGC gives its approval for the User’s Safety Rules (or the NGC’s Safety Rules, as the case may be) to apply to the User when working on its Plant and/or Apparatus, that does not imply that the User’s Safety Rules (or the NGC’s Safety Rules, as the case may be) will apply to entering the NGC Site (or a User Site, as the case may be) Transmission Site and access to the User’s (or NGC’s, as the case may be) Plant and/or Apparatus on that NGC Site (or User Site, as the case may be) Transmission Site. Bearing in mind NGC’s (or a User’s, as the case may be) responsibility for the whole NGC Site (or User Site, as the case may be) Transmission Site, entry and access will always be in accordance with NGC’s, or the User’s, as the case may be, site access procedures. For a User Site in England and Wales, if the User gives its approval for NGC’s Safety Rules to apply to NGC when working on its Plant and Apparatus, that does not imply that NGC’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, if NGC 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, 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/or 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 NGC of any Safety Rules that apply to NGC's staff working on User Sites. For Transmission Sites in England and Wales, NGC shall notify Users of any Safety Rules that apply to the User's staff working on the Transmission Site.

CC.7.2.6 For User Sites in Scotland, Users and NGC shall notify each other NGC of any Safety Rules that apply to the other's staff working on its Connection Sites. Relevant Transmission Licensee's staff working on User Sites. For Transmission Sites in Scotland NGC 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 NGC Control Engineers of agreed responsibilities for Plant and/or Apparatus at the operational interface, a Site Responsibility Schedule shall be produced for NGC Connection Sites in England and Wales for NGC and Users with whom they interface, and for Connection Sites in Scotland for NGC, 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 NGC.

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 NGC.

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 NGC, an Operation Diagram for all HV Apparatus on the User side of the Connection Point and NGC shall provide the User with an Operation Diagram for all HV Apparatus on the NGC 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 the NGC 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 NGC Transmission Sites

CC.7.4.10 In the case of an NGC Transmission Site, the User shall prepare and submit to NGC 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 NGC 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 NGC has decided that it wishes to install new HV Apparatus or it wishes to change the existing numbering or nomenclature of its Transmission HV Apparatus at an NGC Transmission Site, NGC 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 NGC Transmission Site, incorporating the new NGC 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 NGC 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 NGC 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 NGC 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**, NGC shall prepare and submit to the **User**, **Site Common Drawings** for the **NGC 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 **NGC 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 **NGC Transmission Site**

**CC.7.5.4** In the case of a **NGC Transmission Site**, the **User** will prepare and submit to **NGC 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** **NGC** 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 **NGC Transmission Site**, as soon as reasonably practicable, prepare and submit to **NGC** revised **Site Common Drawings** for the **User** side of the **Connection Point** and **NGC** 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 **NGC** 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 **NGC** 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 **NGC 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 **NGC 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 **NGC Transmission** Site Common Drawings, revised Site Common Drawings for the complete Connection Site.

In either case, if in NGC'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 NGC, 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 NGC and the User, to endeavour to resolve the matters in dispute.

**ACCESS**

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

CC.7.6.2 In addition to those provisions, where an NGC 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 NGC and where a Transmission Site in Scotland 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.

**MAINTENANCE STANDARDS**

CC.7.7.1 It is a requirement that all User's Plant and Apparatus on NGC 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 of NGC's Transmission Plant, Apparatus or personnel on the NGC Transmission Site. NGC will have the right to inspect the test results and maintenance records relating to such Plant and Apparatus at any time. In Scotland, 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 NGC's 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 NGC and Users with an interface with NGC, 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.8 ANCILLARY SERVICES

CC.8.1 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 Generators are obliged to provide, and Part 2 lists the System Ancillary Services which Generators will provide only if agreement to provide them is reached with NGC:

Part 1

(a) Reactive Power supplied otherwise than by means of synchronous or static compensators - CC.6.3.2

(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

CC.8.2 Commercial Ancillary Services

Other Ancillary Services are also utilised by NGC 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 proforma attached or with such variations as may be agreed between NGC and Users, but in the absence of agreement the 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 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 NGC 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 NGC 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);
(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 **NGC 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 **NGC 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\(^1\) 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 **NGC** 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 **NGC** by the **Area** its **Responsible Manager** responsible for the area in which the **Complex** is situated (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, 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 **NGC**, 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** **NGC** and **Users** must make the **Site Responsibility Schedules** readily available to its operational staff at the **Complex** and at the other relevant control points.

**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 **NGC** immediately and in any event 8 weeks

\(^1\) 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.
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 NGC 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 NGC, 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 NGC, or NGC 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.

NGC 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 NGC 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 NGC a list of Managers who have been duly authorised to sign Site Responsibility Schedules on behalf of the User and NGC shall, prior to the Completion Date under each Bilateral Agreement and/or Construction Agreement, supply to that User the name of the Areas Responsible Manager responsible and for the area Connection Sites in which the Complex is situated (each of which is known as the ‘Scotland, the name of the Relevant Transmission Licensee’s Responsible Manager’) and each shall supply to the other User 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
Where a **Connection Site** is to be de-commissioned, whichever of **NGC** 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: ______

.getConnection

<table>
<thead>
<tr>
<th>ITEM OF PLANT/APPARATUS</th>
<th>PLANT APPARATUS OWNER</th>
<th>SITE MANAGER</th>
<th>SAFETY OPERATIONS</th>
<th>PARTY RESPONSIBLE FOR UNDERTAKING STATUTORY INSPECTIONS, FAULT INVESTIGATION &amp; MAINTENANCE</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td>SAFETY RULES</td>
<td>CONTROL OR OTHER RESPONSIBLE PERSON (SAFETY CO-ORDINATOR)</td>
<td>OPERATIONAL PROCEDURES</td>
</tr>
</tbody>
</table>

PAGE: ______ ISSUE NO: ______ DATE: ________________
ATTACHMENT TO APPENDIX 1 OF CONNECTION CONDITIONS

PROFORMA FOR SITE RESPONSIBILITY SCHEDULE

____________________ AREA

COMPLEX: ___________________________ SCHEDULE: ______

CONNECTION SITE: ____________________

<table>
<thead>
<tr>
<th>ITEM OF PLANT/APPARATUS</th>
<th>PLANT APPARATUS OWNER</th>
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<th>OPERATIONAL PROCEDURES</th>
<th>CONTROL OR OTHER RESPONSIBLE ENGINEER</th>
<th>PARTY RESPONSIBLE FOR UNDERTAKING STATUTORY INSPECTIONS, FAULT INVESTIGATION &amp; MAINTENANCE</th>
<th>REMARKS</th>
</tr>
</thead>
</table>

NOTES:

SIGNED: ________________ NAME: ______________ COMPANY: ______________ DATE: ______________

SIGNED: ________________ NAME: ______________ COMPANY: ______________ DATE: ______________

SIGNED: ________________ NAME: ______________ COMPANY: ______________ DATE: ______________

SIGNED: ________________ NAME: ______________ COMPANY: ______________ DATE: ______________

SIGNED: ________________ NAME: ______________ COMPANY: ______________ DATE: ______________

PAGE: ______ ISSUE NO: ________ DATE: ______________
CONNECTION CONDITIONS

APPENDIX 2

PART 1A

PROCEDURES RELATING TO OPERATION DIAGRAMS

- FIXED CAPACITOR
- EARTH
- EARTHING RESISTOR
- LIQUID EARTHING RESISTOR
- ARC SUPPRESSION COIL
- FIXED MAINTENANCE EARTHING DEVICE
- CARRIER COUPLING EQUIPMENT (WITHOUT VT)
- CARRIER COUPLING EQUIPMENT (WITH VT ON ONE PHASE)
- CARRIER COUPLING EQUIPMENT (WITH VT ON 3 PHASES)
- AC GENERATOR
- SYNCHRONOUS COMPENSATOR
- CIRCUIT BREAKER
- CIRCUIT BREAKER WITH DELAYED AUTO RECLOSE
- WITHDRAWABLE METALCLAD SWITCHGEAR
- SWITCH DISCONNECTOR
- SWITCH DISCONNECTOR WITH INCORPORATED EARTH SWITCH
- DISCONNECTOR (CENTRE ROTATING POST)
- DISCONNECTOR (SINGLE BREAK)
- DISCONNECTOR (NON-INTERLOCKED)
- DISCONNECTOR (POWER OPERATED)
- AC - AUTOMATIC
- S - SEQUENTIAL OPERATION
- F - FAULT INTERFERING OPERATION
- NA - NON-AUTOMATIC
- EARTH SWITCH
- FAULT THROWING SWITCH (PHASE TO PHASE)
- FAULT THROWING SWITCH (EARTH FAULT)
- SURGE ARRESTER
- THYRISTOR
**TRANSFORMERS**

*Vectors to indicate winding configurations*

- **Two winding**
- **Three winding**
- **Auto**
- **Auto with Delta Tertiary**

**Earthing or Aux. Transformer**

\(115v\)  

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CONNECTION CONDITIONS

APPENDIX 2

PART 1B

PROCEDURES RELATING TO GAS ZONE DIAGRAMS

- GAS INSULATED BUSBAR
- DOUBLE-BREAK DISCONNECTOR
- GAS BOUNDARY
- EXTERNAL MOUNTED CURRENT TRANSFORMER (WHERE SEPARATE PRIMARY APPARATUS)
- GAS/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 NGC.

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. Disconnectors (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/Diverters
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 Generating Units and/or CCGT Modules with a Completion Date after 1 January 2001
in England and Wales and 1 April 2005 in Scotland

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 each 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. For the avoidance of doubt, this appendix does not apply to Generating Units and/or CCGT Modules which have a Completion Date before 1 January 2001 or to Small Power Stations. 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 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.

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.

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 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 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 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. Each Generating Unit and/or CCGT Module 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 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 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 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 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 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 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 NGC and carried out by Generators for compliance purposes and to validate the content of Ancillary Services Agreements using an injection of a frequency change to the plant control system (ie 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.

The Primary Response capability (P) of a Generating Unit or a CCGT Module 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.

The Secondary Response capability (S) of a Generating Unit or a CCGT Module 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 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.

CC.A.3.5 REPEATABILITY OF RESPONSE

When a Generating Unit or CCGT Module 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

RC – Registered Capacity
MG – Minimum Generation
DMOL – Designed Minimum Operating Level

Loading (% on RC)

Primary/Secondary/High Frequency Response levels (% on RC)

RC – Registered Capacity
MG – Minimum Generation
DMOL – Designed Minimum Operating Level

Primary/Secondary
High
Plant dependent requirement
Figure CC.A.3.2 - Interpretation of Primary and Secondary Response Values

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

[Not Used]

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 be in accordance with the requirements of the Bilateral Agreement. They should 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 on the requirements of approved Low Frequency Relays for automatic installations is given as an indication, without prejudice to the provisions that may be included in a Bilateral Agreement:

(a) Frequency settings: 47-50Hz in steps of 0.05Hz or better, preferably 0.01Hz;
(b) Measurement period settings: Within a minimum selectable settings range of 4 to 6 cycles;
(c) Operating time: Between 100 and 150ms dependent on measurement period setting;
(d) Voltage lock-out: Selectable within a range of 55 to 90% of nominal voltage;
(e) Facility stages: One or two stages of Frequency operation;
(f) Output contacts: Two output contacts per stage to be capable of repetitively making and breaking for 1000 operations.

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 by NGC and is not reduced unacceptably during equipment outage or maintenance conditions.

< 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 NGC taking account of Demand forecasts furnished by Network Operators and in certain circumstances, Generators, who shall provide NGC 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, NGC will conduct its own Demand forecasting taking into account information to be furnished by Suppliers, Network Operators and by Generators 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 NGC GB 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. NGC 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 NGC Financial Year at any time, Year 1 means the next NGC Financial Year at any time, Year 2 means the NGC 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 NGC 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 NGC when Demand forecasting in the Programming Phase and Control Phase.

OC1.3 SCOPE

OC1 applies to NGC and to Users which in this OC1 means:-

(a) Generators,

(b) Network Operators, and

(c) Suppliers.

OC1.4 DATA REQUIRED BY NGC IN THE OPERATIONAL PLANNING PHASE

OC1.4.1 (a) Each User, as specified in (b) below, shall provide NGC with the data requested in OC1.4.2 below.

(b) The data will need to be supplied by:-

(i) each Network Operator directly connected to the NGC GB Transmission System in relation to Demand Control; and

(ii) each Generator with respect to the output of Medium Power Stations.

OC1.4.2 (a) Data
By calendar week 28 each year each Network Operator will provide to NGC in writing the forecast information listed in (c) below for the current NGC Financial Year and each of the succeeding five NGC 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 NGC.

(c) Embedded Medium Power Station Output and Demand Control:
For the specified time of the annual peak half hour NGC GB Transmission System Demand, as specified by NGC under PC.A.5.2.2, the output of Embedded Medium Power Stations (whether Embedded or not) 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 NGC 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 NGC 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 of 12MW or more 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 Generator will, if reasonably required by NGC, supply MW schedules for the operation of Medium Power Stations 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 NGC 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 of 12MW or more 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 Generator will, if reasonably required by NGC, supply MW schedules for the operation of Medium Power Stations on a half hourly and Grid Supply Point basis.

OC1.5.3 **Medium Power Station Output:**
Each Generator will, if reasonably required by NGC, supply NGC with MW schedules for the operation of Medium Power Stations on a half hourly and Grid Supply Point basis in writing by 1000 hours each day (or such other time specified by NGC 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 NGC at least one week in advance) to cover holiday periods);

OC1.5.4 Other Codes
Under OC6 each Network Operator will notify NGC of their proposed use of Demand Control (which may result in a Demand change of 12MW or more equal to or greater than the Demand Control Notification Level), and under BC1, each Supplier will notify NGC of their proposed use of Customer Demand Management (which may result in a Demand change of 12MW of more 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 NGC of any Demand Control proposed by itself which may result in a Demand change of 12MW or more 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 NGC 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 NGC of any Customer Demand Management proposed by itself which may result in a Demand change of 12MW or more 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 NGC 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 NGC 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 NGC 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 of 12MW or more 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 of 12MW or more 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 NGC FORECASTS

OC1.6.1 The following factors will be taken into account by NGC when conducting NGCGB Transmission System Demand forecasting in the Programming Phase and Control Phase:

(a) Historic Demand data (this includes NGC GB 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 NGC in advance.

(d) Anticipated interconnection flows across External Interconnections.

(e) Demand Control of 12MW or more 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 NGC has been informed.

(f) Customer Demand Management of 12MW or more 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 NGC 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 NGC in accordance with the provisions of BC1 and BC2.

OC1.6.2 Taking into account the factors specified in OC1.6.1 NGC uses Demand forecast methodology to produce forecasts of NGCGB Transmission System Demand. A written record of the use of the methodology must be kept by NGC 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 GB National Demand. NGCGB 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 NGC, and it will base its NGCGB Transmission System Demand forecasts on those factors only.

< End of OC1 >
OPERATING CODE NO.2
OPERATIONAL PLANNING AND DATA PROVISION

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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 Gensets, the NGC GB Transmission System and Network Operators' Systems for construction, repair and maintenance;

(b) provision by NGC of the Surpluses both for the NGC GB Transmission System and System Zones;

(c) the provision by Generators of Generation Planning Parameters for Gensets, including CCGT Module Planning Matrices, to NGC 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 NGC GB Transmission System Demand together with a reserve of generation to provide a margin, taking into account outages of certain Generating Units, and of parts of the NGC GB 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 the NGC’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 Gensets and for the release of parts of the NGC GB 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 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.

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, and references to neutral data is to data which has a 50% probability of being exceeded.

OC2.1.5 References to NGC planning its GB Transmission System outage programme on the basis of the Final Generation Outage Programme, are to NGC 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 NGC, 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 NGC shall, in its reasonable discretion, determine. However, NGC 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 Where in this OC2 a Generator is required to submit an Output Usable forecast of its Large Power Stations or of each of its Gensets, in the case of Embedded Large Power Stations and Embedded Gensets, the Output Usable forecast must be adjusted by the User prior to submission to represent MW at the relevant Grid Supply Point.

OC2.1.8 In Scotland, it may be possible with the agreement of NGC 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 NGC to harmonise outages of Gensets in order that such outages are co-ordinated (taking account of Medium Power Stations) between Generators and Network Operators, and that such outages are co-ordinated taking into account NGCGB Transmission System outages and other System outages, so far as possible to minimise the number and effect of constraints on the NGCGB Transmission System or any other System.

(b) In the case of Network Operator' User Systems directly connected to the NGCGB Transmission System this means in particular that there will also need to be harmonisation of outages of Embedded Gensets, and NGCGB 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 NGC of the Surpluses both for the NGCGB 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 NGC 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 NGC 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 NGC will review the boundaries if, in NGC's reasonable opinion, such a review is justified.

OC2.3 SCOPE

OC2.3.1 OC2 applies to NGC and to Users which in OC2 means:-
(a) Generators, other than those which only have Embedded Small Power Stations or Embedded Medium Power Stations, (and the term Generator in this OC2 shall be construed accordingly);

(b) Network Operators; and

(c) Non-Embedded Customers.

OC2.4 PROCEDURE

OC2.4.1 Co-ordination of Outages

OC2.4.1.1 Under OC2 the interaction between NGC and Users will be as follows:

(a) Each Generator and NGC in respect of outages of Large Power Stations (both Embedded and non-Embedded) Gensets and in respect of outages of other Plant and/or Apparatus directly connected to the NGCGB Transmission System;

(b) NGC and each Generator in respect of NGCGB Transmission System outages relevant to each Generator (other than in respect of Embedded Small Power Stations or Embedded Medium Power Stations);

(c) NGC 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) NGC and each Network Operator and each Non-Embedded Customer in respect of NGCGB Transmission System outages relevant to the particular Network Operator or Non-Embedded Customers;

(e) Each Network Operator and each Non-Embedded Customer and NGC in respect of User System outages relevant to NGC.

OC2.4.1.2 PLANNING OF GENSET OUTAGES

OC2.4.1.2.1 Operational Planning Phase - Planning for Years 3 to 5 inclusive

In each calendar Planning year:

(a) By the end of week 2

Each Generator will provide NGC in writing with:
(i) a provisional Genset outage programme (covering both Embedded and all non-Embedded Power Stations and Embedded Large Power Stations) for Year 3 to Year 5 (inclusive) specifying the Genset 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 neutral 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

NGC will be:

(i) calculating total winter peak generating capacity assumed to be available to the Total System (taking into account the 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 NGC (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 Gensets.

During this period, NGC may, as appropriate, contact each Generator who has supplied information to seek clarification on points.

(c) By the end of week 12

NGC will:

(i) having taken into account the information notified to it by Generators and taking into account:-

   (1) NGC GB Transmission System constraints and outages,

   (2) Network Operator System constraints and outages, known to NGC, 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 NGC believes necessary, and will advise Generators with Large Power Stations of the Surpluses both for the NGC GB 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 Gensets which are either in that Network Operator’s User System or which may, in the reasonable opinion of NGC, affect the integrity of that Network Operator’s User System provided that, in such circumstances NGC has notified the Generator concerned at least 48 hours beforehand of its intention to do so (including identifying the Genset 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 NGC to explain its concerns and NGC 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 NGC 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 NGC. 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 NGC in writing with an updated provisional Genset outage programme covering both Embedded and non-Embedded Large Power Stations together with the best estimate neutral weekly Output Usable forecasts (with a description of its statistical basis) for each Genset, in all cases for Year 3 to Year 5 (inclusive). The updated provisional Genset 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

NGC will be considering the updated provisional Genset outage programme, together with the best estimate neutral 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

NGC will:
(i) provide each **Generator** in writing with details of any suggested revisions considered by **NGC** as being necessary to the updated provisional **Genset** outage programme supplied to **NGC** under (e) and will advise **Generators** with **Large Power Stations** of the **Surpluses** for the **NGCGB 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 **Gensets** in its **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 **Genset** 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 **NGC** to explain its concerns and the provisions set out in (d) above will apply to that process.

(i) By the end of week 42

**NGC** will:

(1) provide each **Generator** in writing with details of suggested revisions considered by **NGC** as being necessary to the updated provisional **Genset** outage programme supplied to **NGC** and will advise **Generators** with **Large Power Stations** of the **Surpluses** for the **NGCGB 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 **Gensets** which are either in that **Network Operator's User System** or which may, in the reasonable opinion of **NGC**, affect the integrity of that **Network Operator's User System** provided that, in such circumstances **NGC** has notified the **Generator** concerned at least 48 hours beforehand of its intention to do so (including identifying the **Gensets** concerned).

(j) By the end of week 45

**NGC** will seek to agree a **Final Generation Outage Programme** for Year 3 to Year 5. If agreement cannot be reached on all aspects, **NGC** and each **Generator** will record their agreement on as many aspects as have been agreed and **NGC** will advise each **Generator** with **Large Power Stations** and each **Network Operator**, of the **Surpluses** for the **NGCGB 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 **NGC** to abide by it, but **NGC** will be planning its **NGC the GB 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 **NGCGB Transmission System** outage programme, **NGC** need not alter its **NGC the GB Transmission System** outage programme.
Operational Planning Phase - Planning for Year 1 and Year 2

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 NGC in writing with its previously agreed Final Generation Outage Programme updated and best estimate neutral 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

NGC will be considering the updated proposed Genset 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 NGCGB Transmission System constraints and outages and Network Operator User System constraints and outages known to NGC, NGC will assess whether the estimates of Output Usable supplied by Generators are sufficient to meet forecast NGCGB Transmission System Demand plus the Operational Planning Margin.

(c) By the end of week 12

NGC will:

(i) notify each Generator in writing whether the Output Usable estimates are adequate for Years 1 and 2, weeks 1-52, 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 NGCGB 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 weekly Output Usable estimates of Generators for Years 1 and 2, weeks 1-52 and updated details of potential outages, in each case relating to Gensets which are either in that Network Operator's User System or which may, in the reasonable opinion of NGC, affect the integrity of that Network Operator's User System provided that, in such circumstances, NGC has notified the Generator concerned at least 48 hours beforehand of its intention to do so (including identifying the Gensets concerned).

(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 NGC in writing with revised best estimate neutral 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

NGC 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 NGCGB Transmission System constraints and outages and Network Operator User System constraints and outages known to NGC, NGC will assess whether the estimates of Output Usable supplied by Generators are sufficient to meet forecast NGCGB Transmission System Demand plus the Operational Planning Margin.

(g) By the end of week 39

NGC will:

(i) notify each Generator in writing whether it accepts the Output Usable estimates for Years 1 and 2, weeks 1-52 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 NGCGB 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 Years 1 and 2, weeks 1-52 and updated details of potential outages, in each case relating to Gensets which are either in that Network Operator's User System or which may, in the reasonable opinion of NGC, affect the integrity of that Network Operator's User System provided that, in such circumstances, NGC has notified the Generator concerned at least 48 hours beforehand of its intention to do so (including identifying the Despatch Units concerned).

(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

NGC will seek to agree the revised Final Generation Outage Programme for Year 1 and Year 2. If agreement cannot be reached on all aspects, NGC and each Generator will record their agreement on as many aspects as have been agreed and NGC 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 NGC to abide by it, but NGC will be planning its NGC the GB 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 NGC GB Transmission System outage programme, NGC need not alter the NGC GB Transmission System outage programme.

OC2.4.1.2.3 Operational Planning Phase - Planning for Year 0

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

Each Generator will provide NGC in writing with an update of the Final Generation Outage Programme and a best estimate Output Usable forecast (without allowance being made for Generating Unit breakdown) for each of its Gensets from the 2nd week ahead to the 7th week ahead and a best estimate neutral Output Usable forecast (with allowance being made for Generating Unit breakdown) for each of its Gensets from the 8th week ahead to the 52nd week ahead.

(b) Between 1600 hours Wednesday and 1700 hours Friday

NGC 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 NGC GB Transmission System constraints and outages and Network Operator System constraints and outages known to NGC, NGC will assess whether the estimates of Output Usable supplied by Generators are sufficient to meet forecast NGC GB Transmission System Demand plus the Operational Planning Margin.

(c) On Friday (by 1700 hours)

NGC 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 NGC GB Transmission System and System Zones from the 8th week ahead to the 52nd week ahead;

(ii) provide each Network Operator, in writing with weekly Output Usable estimates from the 8th week ahead to the 52nd week ahead and updated outages, each relating to Gensets which are either in its User System or which may, in the reasonable opinion of NGC, affect the integrity of that Network Operator’s User System and in such circumstances, NGC shall notify the Generator concerned within 48
hours of so providing (including identifying the Gensets concerned), from the 8th week ahead to the 52nd week ahead.

OC2.4.1.2.4 Programming Phase

(a) By 1200 hours each Friday

NGC 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 NGC in writing (or by such electronic data transmission facilities as have been agreed with NGC) with the best estimate of 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 subject to Planned Outage or breakdown. For the period 2 to 7 weeks ahead, each Generator shall provide NGC in writing with changes (start and finish dates) to Planned Outage or to the return to service times of each Genset which is subject to breakdown.

(c) Between 1100 hours and 1600 hours each Business Day

NGC 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 NGCGB Transmission System constraints and outages and Network Operator System constraints and outages known to NGC, NGC will assess whether the estimates of Output Usable are sufficient to meet forecast NGCGB Transmission System Demand plus the Operational Planning Margin.

(d) By 1600 hours each Business Day

(i) NGC will notify in writing (or by such electronic data transmission facilities as have been agreed with NGC) each Generator with Large Power Stations and each Network Operator, of the Surpluses both for the NGCGB Transmission System and System Zones and potential export limitations, for the period 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 NGC by 1100 hours and if a suitable electronic data transmission facility is in place between NGC 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, NGC 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) provide each Network Operator, where it has an effect on that User, in writing with Output Usable estimates from and including day 2 ahead to day 14 ahead and updated outages, each relating to Gensets which are either in its User System or which may, in the reasonable opinion of NGC, affect the integrity of that Network Operator's User System and in such circumstances, NGC shall notify the Generator concerned within 48 hours of so providing (including identifying the Gensets concerned), for the period from and including day 2 ahead to day 14 ahead.

OC2.4.1.3 Planning of NGCGB Transmission System Outages

OC2.4.1.3.1 Operational Planning Phase - Planning for Years 3 to 5 inclusive ahead

NGC shall plan NGCGB Transmission System outages required in Years 3 to 5 inclusive required as a result of construction or refurbishment works. This contrasts with the planning of NGCGB Transmission System outages required in Years 0, 1 and 2 ahead, when NGC also takes into account NGCGB Transmission System outages required as a result of maintenance.

Users should bear in mind that NGC will be planning its NGC the GB 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 NGC, or in any way conflict with the NGCGB Transmission System outage programme, NGC need not alter its NGC the GB 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 NGC in writing of details of proposed outages in Years 3-5 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 Gensets Embedded within that User System).

(b) By the end of week 13

Each Generator will inform NGC in writing of proposed outages in Years 3 - 5 ahead of Generator owned Apparatus (eg. busbar selectors) other than Gensets, at each Grid Entry Point.

NGC will provide to each Network Operator and to each Generator a copy of the information given to NGC 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
NGC will provide each Network Operator in writing with details of proposed outages in Years 3-5 ahead which may, in NGC's reasonable judgement, affect the performance of its User System.

(d) By the end of week 30

Where NGC 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

NGC will draw up a draft NGCGB Transmission System outage plan covering the period Years 3 to 5 ahead and NGC 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 including in particular proposed start dates and end dates of relevant NGCGB Transmission System outages. NGC will also indicate where a need may exist to issue other operational instructions or notifications or Emergency Instructions to Users in accordance with BC2 to allow the security of the NGCGB Transmission System to be maintained within the Licence Standards.

OC2.4.1.3.3 Operational Planning Phase - Planning for Years 1 and 2 ahead

Each calendar year NGC shall update the draft NGCGB 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 NGC in writing of proposed outages for Years 1 and 2 of Generator owned Apparatus (e.g. busbar selectors) other than Gensets or Non-Embedded Customer owned Apparatus, as the case may be, at each Grid Supply Point.

(b) By the end of week 28

NGC will provide each Network Operator and each Non-Embedded Customer in writing with details of proposed outages in years 1-2 ahead which may, in NGC'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 NGC in writing with details of proposed outages in Years 1 and 2 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 Gensets Embedded within that User System).

(d) Between the end of week 32 and the end of week 34

NGC will draw up a draft NGCGB Transmission System outage plan (which for the avoidance of doubt includes NGC-owned Transmission Apparatus at the Connection Points).

(e) By the end of week 34

NGC will inform:

(i) each Network Operator of the impact on its User System in Years 1 and 2, and;

(ii) each Generator of any potential restrictions on its Large Power Stations in Years 1 and 2.

NGC will provide to each Network Operator and to each Generator a copy of the information given to NGC 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 restrictions or impacts 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

NGC will draw up a final NGCGB Transmission System outage plan covering Years 1 and 2.

(h) By the end of week 49

(i) NGC will complete the final NGCGB Transmission System outage plan for Years 1 and 2. The plan for Year 1 becomes the final plan for Year O when by expiry of time Year I becomes Year 0.

(ii) NGC 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 NGCGB Transmission System outages. NGC will also indicate where a need may exist to issue other operational instructions or notifications or Emergency Instructions to Users in accordance with BC2 to allow the security of the NGCGB Transmission System to be maintained within the Licence Standards. NGC 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 NGCGB Transmission System outage plan for Year 1, NGC will provide to each Generator a copy of the final NGCGB Transmission System outage plan for that year. OC2.4.1.3.4 contains provisions whereby updates of the final NGCGB Transmission System outage plan are provided. The plan and the updates will be provided by post. It should be noted that the final NGCGB Transmission System outage plan for Year 1 and the updates will not give a complete understanding of how the NGCGB 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) The following paragraph contains alternative requirements on NGC, 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 NGC 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 NGC and the User, NGC 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 NGC will:

(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 NGCGB Transmission System; or

System Data Exchange

(z) as part of a process to facilitate understanding of the operation of the Total System,

(1) NGC will make available to each Network Operator, the NGCGB Transmission System Study Network Data Files covering Year 1 and 2 which are of relevance to that User's System;

(2) where NGC 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 NGCGB 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 NGC and may be subject to separate agreements governing the manner of access. In the absence of agreement, the copy of the NGCGB Transmission System Study Network Data Files will be given to the User on a disc, or in hard copy, as determined by NGC;

(3) the data contained in the NGCGB Transmission Study Network Data Files represents NGC's view of indicative operating conditions only and should be used for technical analysis only on the basis that it only represents a view and that operating conditions may be different in the event;

(4) NGC will notify each Network Operator, as soon as reasonably practicable after it has updated the NGCGB Transmission System Study Network Data Files covering Years 1 and 2 that it has done so, when this update falls before the next annual update under this OC2.4.1.3.3(i). NGC 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 NGCGB 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 NGCGB 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 Year 0 down to the Programming Phase (and in the case of load transfer capability, also during the Programming Phase)

(a) The NGCGB 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 NGC 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, NGC 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 NGC of the written request in question.

Where NGC determines that any change so requested is possible and notifies the relevant User accordingly, NGC will provide to each Network Operator and each Generator a copy of the request to which it 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 NGC's request make available to NGC such details of automatic and manual load transfer capability of 12MW or more (averaged over any half hour):

(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.

(d) When necessary during Year 0, NGC will notify each Generator and Network Operator and each Non-Embedded Customer, in writing of those aspects of the NGCGB Transmission System outage programme in the period from the 8th week ahead to the 52nd week ahead, which may, in NGC'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 NGCGB Transmission System outages.

NGC will also notify changes to information supplied by NGC 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) NGC 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 NGCGB 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 NGCGB Transmission System Study Network Data Files covering Year 0 which are of relevance to that User's System.

(ii) NGC will notify each relevant Network Operator, as soon as reasonably practicable after it has updated the NGCGB Transmission System Study Network Data Files covering Year 0, that it has done so. NGC will then make available to each such Network Operator, the updated NGC_GB 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.

NGC will also indicate where a need may exist to issue other operational instructions or notifications or Emergency Instructions to Users in accordance with BC2 to allow the security of the NGCGB Transmission System to be maintained within the Licence Standards.
In addition, by the end of each month during Year 0, NGC will provide to each Generator a notice containing any revisions to the final NGC GB 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 each Thursday (by 1600 hours)

(i) NGC shall prepare a preliminary NGC GB Transmission System outage programme for the eighth week ahead, a provisional NGC GB Transmission System outage programme for the next week ahead and a final day ahead NGC GB Transmission System outage programme for the following day.

(ii) NGC will notify each Generator and Network Operator and each Non-Embedded Customer, in writing of those aspects of the preliminary NGC GB 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 NGC GB Transmission System outages and changes to information supplied by NGC pursuant to OC2.4.1.3.3(i)(x) and (y) (if OC2.4.1.3.3(i)(z) does not apply).

NGC will also indicate where a need may exist to use Operational Intertripping, 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 NGC GB Transmission System to be maintained within the Licence Standards.

(b) By 1000 hours each Friday

Generators and Network Operators will discuss with NGC and confirm in writing to NGC, acceptance or otherwise of the requirements detailed under OC2.4.1.3.5.

(c) By 1600 hours each Friday

(i) NGC shall finalise the preliminary NGC GB Transmission System outage programme up to the seventh week ahead. NGC 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) NGC shall finalise the provisional NGC GB Transmission System outage programme for the next week ahead.

(iii) NGC shall finalise the NGC GB Transmission System outage programme for the weekend through to the next normal working day.
(iv) In each case NGC 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 NGCGB 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 NGC 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 NGC 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 NGC may take the outage despite that Generator's concerns.

(d) By 1600 hours each Monday, Tuesday and Wednesday

(i) NGC shall prepare a final NGCGB Transmission System outage programme for the following day.

(ii) NGC 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 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 NGC 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 NGC promptly.

(f) 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.3.2.2. If in accordance with PC.A.3.2.2 an amendment is made, any consequential changes to the Generation Planning Parameters should be notified to NGC promptly.

(g) The Generator Performance Chart must be on a Generating Unit specific basis at the Generating Unit Stator Terminals and must include details of the Generating Unit transformer parameters and demonstrate the limitation on reactive capability of the System voltage at 3% above nominal. It must include any limitations on output due to the prime mover (both maximum and minimum) and Generating Unit step-up transformer.

(h) For each CCGT Unit, and any other Generating Unit whose performance varies significantly with ambient temperature, the Generator Performance Chart shall show curves for at least two values of ambient temperature so that NGC 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, as appropriate, equals its Registered Capacity.

(i) The Generation Planning Parameters supplied under OC2.4.2.1 shall be used by NGC 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 NGC 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 NGC 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.3.2.2. If in accordance with PC.A.3.2.2 an amendment is made, an updated CCGT Module Planning Matrix must be immediately submitted to NGC in accordance with this OC2.4.2.1(b).

The CCGT Module Planning Matrix will be used by NGC 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 NGC 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 NGC will, taking into account the Final Generation Outage Programme and forecast of neutral 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 NGC'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. NGC 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 NGC 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 NGC 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 NGC, 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 NGC'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) NGC 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) NGC 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. NGC 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 NGC, and NGC 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 NGC, 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 NGC’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) NGC will contact all Generators in respect of their Large Power Stations (or in the case of Localised NRAPM, all Generators which
may, in NGC'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 NGC's reasonable opinion, too low, then in accordance with the procedures and requirements set out in BC1.5.5 NGC 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 NGC 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) NGC 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 NGC provided the request is within the Existing AGR Plant Flexibility Limit.

(ii) NGC 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 NGC 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, NGC 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 NGC permits Existing Gas Cooled Reactor Plant other than Frequency Sensitive AGR Units to operate in a Limited Frequency Sensitive Mode at all times.
OC2.4.3 If NGC 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 Generating Units comprising each Generator’s relevant Large Power Stations (the MW amount being determined by NGC but the Generating Units involved being determined by the Generator) will take outages to coincide with such period as NGC 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 NGC. If agreement is not reached, then the provisions of BC2.9.5 may apply.

OC2.4.5 If in NGC’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 NGC 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 NGC may have specified) provided the overall capacity at each setting and System requirements can, in NGC’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 NGC by 1200 hours on the Friday prior to the Monday on which it would like to institute the changes to seek NGC’s agreement. If NGC agrees, NGC 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, NGC will take account of any Large Power Station unavailability
(as notified under OC2.4.1.2 submissions) in its total Operating Reserve policy.

NGC 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, NGC will provide an indication of the level of Operating Reserve to be utilised by NGC 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 NGC 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.
Generator Performance Chart

**Key**

A) Practical Stability Limit
B) Rotor Heating Limit
C) Transformer Tap Limit
D) Transformer MVA Limit

**Generator**

- MW: 500
- MVA: 588
- pf: 0.85
- kV: 22
- Xd: 2.88

**Transformer**

- MVA: 570
- X: 0.147

**Unit Transformer**

- MW Load: 15
- MVAR Load: 11.25

**System Voltage**

- 400 kV Nominal
- 412 kV High

File Ref: 76 :B

**Comments**

Operating Chart Confirmed by Loading Tests

Generating Unit Stator Terminals
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 **NGC** 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 OUTPUT USABLE</th>
<th>CCGT GENERATING UNITS AVAILABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st GT</td>
</tr>
<tr>
<td>MW</td>
<td></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>

< End of OC2 >
OPERATING CODE NO. 3

Not Used

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OPERATING CODE NO. 4

Not Used

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OPERATING CODE NO. 5
TESTING AND MONITORING

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<td>OC5-1</td>
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<td>OC5.7.1 General</td>
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<td>OC5-1213</td>
</tr>
<tr>
<td>OC5.7.2.4 Failure of a Black Start Test</td>
<td>OC5-1213</td>
</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 NGC 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 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.

**OC5.2 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 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 NGC and to Users, which in OC5 means:

(a) Generators;
(b) Network Operators;
(c) Non-Embedded Customers; and
(d) Suppliers.

OC5.4 MONITORING

OC5.4.1 Parameters to be monitored

NGC 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 NGC'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, NGC shall notify the relevant User giving details of the failure and of the monitoring that NGC has carried out.

OC5.4.2.2 The relevant User will, as soon as possible, provide NGC 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 or CCGT Module 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 **NGC** 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 **NGC** to the **User**, **NGC** 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 **NGC** 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 **NGC** has reasonable grounds of justification based upon:

(a) a submission of data from a **User** indicating a change in performance; or

(b) a statement from a **User** indicating a change in performance; or

(c) monitoring carried out in accordance with OC5.4.2; or

(d) 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 or a CCGT Module 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 **NGC** 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 NGC 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 NGC Transmission Control Centres notified by NGC, 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 Generating Unit, taken on the Generating Unit Stator Terminals / on the LV side of the generator transformer) in the relevant User’s Control Room, in the presence of a reasonable number of representatives appointed and authorised by NGC. If NGC 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.

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 NGC 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 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 Bilateral Agreement, 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 Phase (Voltage) Unbalance on the NGCGB Transmission System should remain, in England and Wales, below 1% and, in Scotland, below 2%.</td>
</tr>
<tr>
<td>Phase Unbalance</td>
<td>CC.6.1.6</td>
<td>Measured in England and Wales, measured infrequent short duration peaks in phase unbalance Phase (Voltage) Unbalance should not exceed the maximum value stated in the Bilateral Agreement.</td>
</tr>
<tr>
<td>Voltage Fluctuations</td>
<td>CC.6.1.7(a)</td>
<td>Measured in England and Wales, measured voltage fluctuations at the Point of Common Coupling 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 Point of Common Coupling shall not exceed the limits set out in Engineering Recommendation P28.</td>
</tr>
<tr>
<td>Flicker</td>
<td>CC.6.1.7(b)</td>
<td>Measured voltage fluctuations at the Point of Common Coupling shall not exceed the, for voltages above 132kV, Flicker Severity (Short Term) of 0.8 Unit and a Flicker Severity (Long Term) of 0.6 Unit, and, for voltages at 132kV and below, shall not exceed Flicker Severity (Short Term) of 1.0 Unit and Flicker Severity (Long Term) of 0.8 Unit, as set out in Engineering Recommendation P28 as current at the Transfer Date.</td>
</tr>
</tbody>
</table>
### Parameter to be Tested

<table>
<thead>
<tr>
<th>Fault Clearance Times</th>
<th>CC.6.2.2.2.2(a)</th>
<th>CC.6.2.3.1.1(a)</th>
<th>The fault clearance times shall be in accordance with the Bilateral Agreement.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Back-Up Protection</td>
<td>CC.6.2.2.2.2(b)</td>
<td>CC.6.2.3.1.1(b)</td>
<td>The Back-Up Protection system provided by Generators operates in the times specified in CC.6.2.2.2.2(b). The Back-Up Protection system provided by Network Operators and Non-Embedded Customers operates in the times specified in CC.6.2.3.1.1(b) and with Discrimination as specified in the Bilateral Agreement.</td>
</tr>
<tr>
<td>Circuit Breaker fail Protection</td>
<td>CC.6.2.2.2.2(c)</td>
<td>CC.6.2.3.1.1(c)</td>
<td>The circuit breaker fail Protection shall initiate tripping so as to interrupt the fault current within 200ms.</td>
</tr>
<tr>
<td>Reactive Capability</td>
<td>CC.6.3.2</td>
<td>CC.6.3.4</td>
<td>The Generating Unit will pass the test if it is within ±5% of the reactive capability registered with NGC under OC2 which shall meet the requirements set out in CC.6.3.2. The duration of the test will be for a period of up to 60 minutes during which period the System voltage at the Grid Entry Point for the relevant Generating Unit will be maintained by the Generator at the voltage specified pursuant to BC2.8 by adjustment of Reactive Power on the remaining Generating Units, if necessary. Measurements of the Reactive Power 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>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------------</td>
<td>---------------</td>
<td></td>
</tr>
<tr>
<td><strong>Primary, Secondary and High</strong></td>
<td></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>
<td></td>
</tr>
<tr>
<td>Stability with Voltage</td>
<td>CC.6.3.4</td>
<td>The measured Active Power output under steady state conditions of any Generating Unit directly connected to the NGC GB Transmission System should not be affected by voltage changes in the normal operating range.</td>
<td></td>
</tr>
<tr>
<td>Governor Standard</td>
<td>CC.6.3.7(a)</td>
<td>Measurements indicate that the Governor parameters are within the criteria set out in the appropriate governor standard (the version of which to apply being determined within CC.6.3.7).</td>
<td></td>
</tr>
<tr>
<td>Governor Stability</td>
<td>CC.6.3.7(b)</td>
<td>The measured Generating Unit Active Power Output shall be stable over the entire operating range of the Generating Unit.</td>
<td></td>
</tr>
<tr>
<td>Governor Droop</td>
<td>CC.6.3.7(c)(ii)</td>
<td>The measured speed governor overall speed droop should be between 3% and 5%.</td>
<td></td>
</tr>
<tr>
<td>Governor Deadband</td>
<td>CC.6.3.7(c)(iii)</td>
<td>Except for the Steam Unit within a CCGT Module, the measured speed governor deadband shall be no greater than 0.03Hz (for the avoidance of doubt, ±0.015Hz).</td>
<td></td>
</tr>
<tr>
<td><strong>Target Frequency</strong></td>
<td>CC.6.3.7(d)</td>
<td>Target Frequency settings over at least the range 50 ±0.1 Hz shall be available.</td>
<td></td>
</tr>
<tr>
<td>Response Capability</td>
<td>CC.6.3.7(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 shall meet requirement profile contained in Connection Conditions Appendix 3.</td>
<td></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>
<td></td>
</tr>
<tr>
<td>Output at reduced System</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 25ºC.</td>
<td></td>
</tr>
<tr>
<td>Parameter to be Tested</td>
<td>Grid Code Reference</td>
<td>Pass Criteria (to be read in conjunction with the full text under the Grid Code reference)</td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------------</td>
<td>-----------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Fast Start</td>
<td></td>
<td>The Fast Start Capability requirements of the Ancillary Services Agreement for that Genset are met.</td>
<td></td>
</tr>
<tr>
<td>Black Start</td>
<td>OC.5.7.1</td>
<td>The relevant Generating Unit is Synchronised to the System within two hours of the Auxiliary Gas Turbine(s) or Auxiliary Diesel Engine(s) being required to start.</td>
<td></td>
</tr>
<tr>
<td>Excitation System</td>
<td>CC.6.3.8(a) &amp; BC2.11.2</td>
<td>Measurements of the continuously acting automatic excitation control system are required to demonstrate the provision of constant terminal voltage control of the Generating Unit without instability over the entire operating range of the Generating Unit. The measured performance of the automatic excitation control system should also meet the requirements (including Power System Stabiliser performance) specified in the Bilateral Agreement.</td>
<td></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 NGC’s reasonable satisfaction, the reliability of the suitable recorders, disclosing calibration records to the extent appropriate.

<table>
<thead>
<tr>
<th>Parameter to be Tested</th>
<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>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>
OC5.4 Test Failure/Re-test

If the BM Unit concerned fails to pass the test the User must provide NGC with a written report specifying in reasonable detail the reasons for any failure of the test so far as they are then known to the 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, NGC 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 NGC 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 NGC had issued an instruction at the time of notice from the User.

OC5.5 Dispute following Re-test

If the BM Unit in NGC'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 has failed the test or re-test (as applicable), the User shall within 14 days, or such longer period as NGC may reasonably agree, following such failure, submit in writing to NGC 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. NGC will not unreasonably withhold or delay its approval of the User's proposed date and time submitted. Should NGC not approve the User's proposed date or time (or any revised proposal), the User should amend such proposal having regard to any comments NGC 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 or a CCGT Module, the User may amend, with NGC's approval, the relevant registered parameters of that Generating Unit or CCGT 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 NGC the date and time that the BM Unit can achieve the parameters previously registered or submitted, NGC 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

OC5.7.1 General

(a) NGC 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 NGC requires a **Generator** with a **Black Start Station** to carry out a **BS Unit Test**, NGC 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) NGC 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 NGC 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**.
The relevant **Generating Unit** shall be **Synchronised** to the **System** but not **Loaded**, unless the appropriate instruction has been given by **NGC** 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 **NGC** 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 **NGC**, who shall be given access to all information relevant to the **Black Start Test**.

**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 **NGC** with a written report specifying in reasonable detail the reasons for any failure of the test so far as they are then known to the **Generator** after due and careful enquiry. This must be provided within five **Business Days** of the test. If a dispute arises relating to the failure, **NGC** and the relevant **Generator** shall seek to resolve the dispute by discussion, and if they fail to reach agreement, the **Generator** may require **NGC** 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 **NGC** 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 NGC may reasonably agree, following such failure, the relevant Generator shall submit to NGC 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 NGC will not unreasonably withhold or delay its approval of the Generator's proposed date and time submitted. Should NGC not approve the Generator's proposed date and time (or any revised proposal) the Generator shall revise such proposal having regard to any comments NGC may have made and resubmit it for approval.

OC.5.7.2.8 Once the Generator has indicated to NGC that the Generating Station has a Black Start Capability, NGC 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.

<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 NGC, 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 NGCGB Transmission System.

OC6.1.2 OC6 deals with the following:

(a) Customer voltage reduction initiated by Network Operators (other than following the instruction of NGC);
(b) Customer Demand reduction by Disconnection initiated by Network Operators (other than following the instruction of NGC);
(c) Demand reduction instructed by NGC;
(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 NGC 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 NGCGB Transmission System and between such Power Stations and a User System will not, as far as possible, be disconnected by NGC 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
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 NGC to achieve reduction in Demand that will either avoid or relieve operating problems on the NGC GB Transmission System, in whole or in part, and thereby to enable NGC 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 NGC is notified of any Demand Control utilised by Users other than following an instruction from NGC.

OC6.2.2 For certain Grid Supply Points in Scotland it is recognised that 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) may not be possible to meet. In these circumstances NGC and the relevant Network Operator(s) will agree equivalent requirements covering a number of Grid Supply Points. If NGC 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 NGC and to Users which in OC6 means:-

(a) Generators; and

(b) Network Operators.

It also applies to NGC 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 NGC 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 NGC GB 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, NGC 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 NGC GB Transmission System and by NGC 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 NGC)

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 NGC 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 of 42MW or more 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 NGC relating to Demand reduction.

OC6.4.2 Under OC6, each Network Operator will notify NGC in writing by 1100 hours each day (or such other time specified by NGC 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 NGC 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 of 42MW or more 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 42MW or more equal to or greater than the Demand Control Notification Level), planned to take place during the next Operational Day.
When the Customer voltage reduction or Demand Disconnection which may result in a Demand change of 12MW or more 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 12MW or more equal to or greater than the Demand Control Notification Level) is planned after 1100 hours, each Network Operator must notify NGC 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 NGC within five minutes of implementation.

Where, after NGC 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 NGC 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 NGC of what took place within five minutes of implementation.

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.

Pursuant to the provisions of OC1.5.6, each Network Operator will supply to NGC details of the amount of Demand reduction actually achieved by use of the Customer voltage reduction or Demand Disconnection.

PROCEDURE FOR THE IMPLEMENTATION OF DEMAND CONTROL ON THE INSTRUCTIONS OF NGC

A NGCGB Transmission System Warning - High Risk of Demand Reduction will, where possible, be issued by NGC, as more particularly set out in OC6.5.4, OC7.4.8 and BC1.5.4 when NGC 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.

Where NGC expects to instruct Demand reduction within the following 30 minutes, NGC will where possible, issue a NGCGB Transmission System Warning - Demand Control Imminent in accordance with OC7.4.8.2(c) and OC7.4.8.6.

(a) Whether a NGCGB Transmission System Warning - High Risk of Demand Reduction or NGCGB 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 NGC 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 NGCGB 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 NGC.

(c) Each Network Operator must notify NGC in writing by calendar week 24 each year of the integral multiples it will use with effect from the succeeding NGC Financial Year onwards. Thereafter, any changes must be notified in writing to NGC at least 10 Business Days prior to the change coming into effect.

OC6.5.4 (a) Where NGC 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 NGCGB 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 NGC may want to instruct (measured at the time the Demand reduction is required).

(b) The NGCGB Transmission System Warning - High Risk of Demand Reduction will specify the percentage of Demand reduction that NGC 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 NGC has issued the NGCGB 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 NGCGB Transmission System Warning.

(d) If NGC has not issued the NGCGB 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 NGCGB Transmission System Warning.

OC6.5.5 (a) If NGC has given a NGCGB 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 NGC GB Transmission System Warning.

(b) NGC accepts that if it has not issued the NGC GB 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 NGC GB 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 NGC, 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 NGC GB Transmission System Warning - High Risk of Demand Reduction if one has been issued),

until NGC instructs that Network Operator in accordance with OC6.

OC6.5.7 Each Network Operator will abide by the instructions of NGC 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 NGC.

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 NGC to be prolonged, NGC will notify the Network Operator of the expected duration.

OC6.5.9 The Network Operator will notify NGC in writing that it has complied with NGC'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 NGC may itself implement Demand reduction and subsequent restoration on Non-Embedded Customers as part of a Demand Control requirement and it will organise the NGC GB 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 NGC GB 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 NGC 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, in England and Wales, 60 per cent, and in Scotland, 40 per cent, of its total peak Demand (based on Annual ACS Conditions), 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.

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, location, size and the associated low Frequency settings of these blocks, will be as specified by NGC by week 12 in each calendar year following discussion with the Network Operator in accordance with the Bilateral Agreement and will be reviewed annually by NGC.

(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 NGC 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 NGC GB 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, NGC 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 NGC 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 NGC 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 NGC.

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 NGC 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 NGC GB Transmission System, will be agreed with NGC 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 NGC of this.

OC6.6.8 The Network Operator or Non-Embedded Customer, as the case may be, will notify NGC 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 NGC 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 NGC, 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 NGC.

OC6.7.2 (a) Each Network Operator shall provide NGC 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 NGC 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 NGC, 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 NGC will notify a Network Operator who has been instructed under OC6.7, of what has happened on the NGC GB 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 NGC, that Network Operator will not reconnect until NGC instructs it to do so in accordance with OC6.

OC6.7.6 Each Network Operator will abide by the instructions of NGC 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 NGC.

OC6.7.7 NGC may itself disconnect manually and reconnect Non-Embedded Customers as part of a Demand Control requirement under emergency conditions.

OC6.7.8 If NGC determines that emergency manual Disconnection referred to in OC6.7 is inadequate, NGC may disconnect Network Operators and/or Non-Embedded Customers at Grid Supply Points, to preserve the security of the NGC GB Transmission System.

OC6.7.9 Pursuant to the provisions of OC1.5.6 the Network Operator will supply to NGC details of the amount of Demand reduction or restoration actually achieved.

OC6.8 OPERATION OF THE BALANCING MECHANISM DURING DEMAND CONTROL

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. NGC will inform affected BM Participants in accordance with the provisions of OC7.
APPENDIX

EMERGENCY MANUAL DEMAND REDUCTION/DISCONNECTION SUMMARY SHEET
(As set out in OC6.7)

NETWORK OPERATOR ____________________ [YEAR] PEAK: ___________________________

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<th>GRID SUPPLY POINT (Name)</th>
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Notes: 1. Data to be provided annually by week 24 to cover the following year.

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# 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 NGCGB 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 NGCGB Transmission System.

It also describes the types of NGCGB Transmission System Warning which may be issued by NGC.

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 NGCGB Transmission System which itself has been caused by (or exacerbated by) an Operation or Event on a User's System, NGC in reporting the Event or Operation on the NGCGB 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 NGCGB Transmission System falls to be reported by NGC 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, NGC 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.

OC7.2 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 NGCGB Transmission System Warnings which may be issued by NGC.
To provide the framework for the information flow and discussion between NGC and certain Users in relation to Integral Equipment Tests.

### SCOPE

**OC7 applies to NGC 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 NGC GB Transmission System Warnings); and

(e) **Externally Interconnected System Operators** (for the purposes of NGC GB Transmission System Warnings).

The procedure for operational liaison by NGC with Externally Interconnected System Operators is set out in the Interconnection Agreement with each Externally Interconnected System Operator.

### 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.

**OC7.4.3** The term "Operational Effect" means any effect on the operation of the relevant other System which causes the GB Transmission System or the Systems of NGC or 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.

**OC7.4.4** 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.

**OC7.4.5** Requirement to notify Operations

**OC7.4.5.1** Operation on the NGC GB Transmission System

In the case of an Operation on the NGC GB Transmission System, which will have (or may have) an Operational Effect on the System(s) of a User or Users, NGC will notify the User or Users whose System(s) will, or may, in the reasonable opinion of NGC, 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 NGC GB 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 NGC GB Transmission System), the User will notify NGC in accordance with OC7. Following notification by the User, NGC will notify any other User or Users on whose System(s) the Operation will have, or may have, in the reasonable opinion of NGC, 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 NGC, an Operational Effect, if it is required to do so by the relevant Interconnection Agreement.

Examples of situations where notification by NGC 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 NGC) 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.

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 NGC is notifying to other Users under OC7.4.5.2, NGC 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 NGC 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 NGC is notifying to other Users under OC7.4.5.2,
answering any question, NGC will not pass on anything further than that which it has been told by the User which has notified it. NGC may pass on the information contained in the notification as provided in OC7.4.5.6.

OC7.4.5.6 (a) A notification by NGC 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 NGC 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 NGC 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 NGCGB Transmission System and will include the name of the individual reporting the Operation on behalf of NGC. The recipient may ask questions to clarify the notification and NGC will, insofar as it is able, answer any questions raised, provided that in relation to the information which NGC is merely passing on from a User, in answering any question NGC 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 NGC 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 NGC 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 NGCGB Transmission System falls to be reported by NGC 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, NGC will include in that report the information which NGC 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 NGC 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 NGCGB Transmission System and will contain the information which NGC 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 NGC 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 NGCGB Transmission System and will include the name of the individual reporting the Operation on behalf of NGC. The recipient may ask
questions to clarify the notification and NGC will, insofar as it is able, answer any questions raised, provided that, in relation to the information which NGC is merely passing on from an Externally Interconnected System Operator or Interconnector User, in answering any question NGC 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 NGC under OC7.4.5.1, to a Generator with a Generating Unit 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 other User System is connected to the System of that Network Operator) (if the Operation on the NGC GB Transmission System caused it).

(b) A Generator may pass on the information contained in a notification to it from NGC under OC7.4.5.1, to another Generator with a Generating Unit 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 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 NGC GB 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 NGC 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 NGC 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 NGC under OC7.4.5.1, which is not bound by the Grid Code, does not pass on any information other than as provided above.
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.

**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.

### Requirements to notify Events

#### Events on the NGCGB Transmission System

In the case of an Event on the NGCGB Transmission System which has had (or may have had) an Operational Effect on the System(s) of a User or Users, NGC will notify the User or Users whose System(s) have been, or may have been, in the reasonable opinion of NGC, affected, in accordance with OC7.

#### 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 NGCGB Transmission System, the User will notify NGC in accordance with OC7.

#### 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.

#### NGC 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.

### Examples of situations where notification by NGC 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:

- 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 NGC 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. NGC 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 NGC 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 NGC 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 NGC 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 NGC GB Transmission System and will include the name of the individual reporting the Event on behalf of NGC. The recipient may ask questions to clarify the notification and NGC will, insofar as it is able, answer any questions raised, provided that in relation to the information which NGC is merely passing on from a User, in answering any question NGC 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 NGC 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 NGC 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 NGC GB Transmission System falls to be reported by NGC 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, NGC will include in that report the information which NGC 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 NGC of (or relating to) an Event under OC7.4.6.1 which has been caused by (or exacerbated by) the equivalent of an Event on the equivalent of a System of an Externally Interconnected System Operator or Interconnector User, will describe the Event on the NGCGB Transmission System and will contain the information which NGC 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 NGC 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 NGCGB Transmission System and will include the name of the individual reporting the Event on behalf of NGC. The recipient may ask questions to clarify the notification and NGC 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 NGC is merely passing on from an Externally Interconnected System Operator or Interconnector User, in answering any question NGC 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 NGC under OC7.4.6.1, to a Generator with a Generating Unit 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 other User System is connected to the System of that Network Operator) (if the Event on the NGCGB Transmission System caused or exacerbated it).

(b) A Generator may pass on the information contained in a notification to it from NGC under OC7.4.6.1, to another Generator with a Generating Unit 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 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 NGCGB 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 NGC.
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 NGC 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 NGC 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, has been reported to NGC by a Generator under OC7.4.6 and it is necessary in order for the Generator to assess the implications of the Event on its System more accurately, the Generator may ask NGC for details of the fault levels from the NGC GB Transmission System to that Generating Unit at the time of the Event, and NGC will, as soon as reasonably practicable, give the Generator that information provided that NGC 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 NGC of an Event under OC7 which NGC considers has had or may have had a significant effect on the NGC GB Transmission System, NGC 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 NGC 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 NGC to report that Event in writing in accordance with the provisions of OC10 and will notify NGC accordingly.

OC7.4.7.3 Events which NGC requires a User to report in writing pursuant to OC7.4.7.1, and Events which a User requires NGC 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 NGC GB TRANSMISSION SYSTEM WARNINGS

OC7.4.8.1 Role of NGC GB Transmission System Warnings

NGC GB 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 NGC.

A table of NGC GB 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 NGC GB Transmission System Warnings

(a) Where NGC GB Transmission System Warnings, (except those relating to Demand Control Imminent), are applicable to System conditions or Events which have widespread effect, NGC will notify all Users under OC7.

(b) Where in NGC's judgement System conditions or Events may only have a limited effect, the NGC GB Transmission System Warning will only be issued to those Users who are or may in NGC's judgement be affected.
(c) Where a **NGC GB 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 **NGC**.

**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 **NGC GB Transmission** System Warning. All warnings will be of a form determined by **NGC** 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 **NGC**.

(b) Where a **NGC GB 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 **NGC**. 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 **NGC** prior to its implementation.

Where a **NGC GB 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 **NGC**.

(c) **NGC GB Transmission** System Warnings will be issued by fax, to the facsimile number(s) and locations agreed between **NGC** 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 **NGC** that they have a **Trading Point**)

(d) **Users** may at times be informed by telephone or other means of **NGC GB 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 **NGC GB Transmission** System Warnings**

**NGC GB Transmission** System Warnings consist of the following types:-

(i) **NGC GB Transmission** System Warning - Inadequate System Margin

(ii) **NGC GB Transmission** System Warning - High Risk of Demand Reduction

(iii) **NGC GB Transmission** System Warning - Demand Control Imminent

(iv) **NGC GB Transmission** System Warning - Risk of System Disturbance

**OC7.4.8.5 **NGC GB Transmission** System Warning - Inadequate System Margin**

A **NGC GB 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.

OC 7.4.8.6 **NGC GB Transmission System Warning - High Risk of Demand Reduction**

(a) A **NGC GB 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 NGC’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 **NGC GB 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 **NGC GB Transmission System Warning - High Risk of Demand Reduction** may also be issued by NGC 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 **NGC GB 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 NGC anticipates that a protracted period of generation shortage may exist a **NGC GB 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 **NGC GB 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 **NGC GB 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 **NGC GB Transmission** System Warning - Demand Control Imminent

(a) A **NGC GB Transmission** System Warning - Demand Control Imminent, relating to a Demand reduction under OC6.5, will be issued by NGC 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 **NGC GB Transmission** System Warning - Demand Control Imminent, need not be preceded by any other **NGC GB 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, NGC will either reissue the **NGC GB Transmission** System Warning - Demand Control Imminent or cancel the **NGC GB 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 **NGC GB Transmission** System Warning - Risk of System Disturbance

(a) A **NGC GB Transmission** System Warning - Risk of System Disturbance will be issued by NGC to Users who may be affected when NGC knows there is a risk of widespread and serious disturbance to the whole or part of, the **NGC GB Transmission** System;

(b) The **NGC GB Transmission** System Warning - Risk of System Disturbance will contain such information as NGC deems appropriate;

(c) for the duration of the **NGC GB Transmission** System Warning - Risk of System Disturbance, each User in receipt of the **NGC GB 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 **NGC GB Transmission** System Warning - Risk of System Disturbance is in effect, NGC 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 **NGC GB Transmission** System Warning

(a) NGC will give notification of a Cancellation of **NGC GB Transmission** System Warning to all Users issued with the **NGC GB Transmission** System Warning when in NGC’s judgement System conditions have returned to normal.

(b) A Cancellation of **NGC GB Transmission** System Warning will identify the type of **NGC GB Transmission** System Warning being cancelled and the period for which it was issued. The Cancellation of **NGC GB Transmission** System Warning will also identify any **NGC GB Transmission** System Warnings that are still in force.
OC7.4.8.10 General Management of **NGC GB Transmission System Warnings**

(a) **NGC GB Transmission System Warnings** remain in force for the period specified unless superseded or cancelled by **NGC**.

(b) A **NGC GB Transmission System Warning** issued for a particular period may be superseded by further related warnings. This will include **NGC GB Transmission System Warning - Inadequate System Margin** being superseded by **NGC GB Transmission System Warning - High Risk of Demand Reduction** and vice-versa.

(c) In circumstances where it is necessary for the period of a **NGC GB Transmission System Warning** to be changed:

(i) the period applicable may be extended by the issue of a **NGC GB Transmission System Warning** with a period which follows on from the original period, or

(ii) revised or updated **NGC GB Transmission System Warnings** will be issued where there is an overlap with the period specified in an existing **NGC GB Transmission System Warning**, but only if the revised period also includes the full period of the existing **NGC GB Transmission System Warning**.

In any other case the existing **NGC GB Transmission System Warning** will be cancelled and a new one issued.

(d) A **NGC GB Transmission System Warning** is no longer applicable once the period has passed and to confirm this **NGC** will issue a **Cancellation of NGC GB Transmission System Warning**.

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**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 **NGC** 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) an **NGC site**, or, a **Transmission Site**, or,

iii) an **Embedded Large Power 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 NGC 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 NGC, 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 NGC 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 NGC receives notification of a proposed IET from a User, NGC 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 NGC with the prior agreement of the proposer. However it is not necessary for NGC to obtain the agreement of any such User as IETs should not involve the application of irregular, unusual or extreme conditions. NGC 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, the Generator must liaise with both NGC and the relevant Network Operator. NGC will not agree to an IET relating to such Plant until the Generator has shown that it has the agreement of the relevant Network Operator.
(c) A Network Operator will liaise with NGC 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 NGC GB 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 NGC 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 NGC 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.
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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 for 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 and Interconnector Users. Suppliers notify NGC of any additional Customer Demand Management that they will initiate. Specified Network Operators and Non-Embedded Customers to prepare their Demand reduction arrangements and take actions as necessary to enable compliance with NGC instructions that may follow. (Percentages of Demand reduction above 20% may not be achieved if NGC has not issued the warning by 16.00 hours the previous day)</td>
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<td>Specified Users only: (to whom an instruction is to be given) Network Operators, Non-Embedded Customers</td>
<td>None</td>
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<td>Possibility of Demand reduction within 30 minutes.</td>
<td>Network Operators specified to prepare to take action as necessary to enable them to comply with any subsequent NGC instruction for Demand reduction.</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 GB 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 Systems in England and Wales and OC8 Appendix 2 applies when work is to be carried out on or near to Systems in Scotland.

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.

OC8.2 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 NGC and to Users, which in OC8 means:

(a) Generators;

(b) Network Operators; and

(c) Non-Embedded Customers.

In Scotland OC8 also applies to Relevant Transmission Licensees.

The procedures for the establishment of safety co-ordination by NGC 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 England and Wales

OC8.4.1.1  OC8 Appendix 1, OC8A, applies when work is to be carried out on or near to Systems in England and Wales.

OC8.4.2  Safety Co-ordination in Scotland

OC8.4.2.1  OC8 Appendix 2, OC8B, applies when work is to be carried out on or near to Systems in Scotland.
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OC8A.1 INTRODUCTION

OC8A specifies the standard procedures to be used by NGC and Users for the co-ordination, establishment and maintenance of necessary Safety Precautions when work is to be carried out on or near the GB Transmission System in England and Wales or the System of a User in England and Wales 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 NGC and Users only in England and Wales. OC8B specifies the procedures to be used by the Relevant Transmission Licensees and Users in Scotland.

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 a User's Site or a Transmission Site (as the case may be) on equipment of the User or NGC 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 Users.

OC8A.1.4 OC8A does not seek to impose a particular set of Safety Rules on NGC and Users; the Safety Rules to be adopted and used by NGC and each 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 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. 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:

---

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[BETTA GO-ACTIVE DATE]
(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 retained in safe custody; or

(ii) maintained and/or secured by such other method which must be in accordance with the Local Safety Instructions of NGC 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 NGC or that 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.

(3) "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 retained 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 NGC or that 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 a User's Site or a Transmission Site (as the case may be) on equipment of the User or NGC (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 NGC and to Users in England and Wales, which in OC8A means:-**

(a) Generators;

(b) Network Operators; and

(c) Non-Embedded Customers.

The procedures for the establishment of safety co-ordination by NGC 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 **User** will supply to NGC 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**, NGC will supply to each **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 NGC and the **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**, NGC and each **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 NGC or a 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 NGC or a 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 NGC or a 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 NGC 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 NGC is the Requesting Safety Co-ordinator, and that in OC8A Appendix B and designated as "RISSP-I", shall be used when NGC is the Implementing Safety Co-ordinator. Proformas of RISSP-R and RISSP-I will be provided for use by NGC staff.

OC8A.4.3.3 (a) 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 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 User.

(c) Whichever method 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 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 User or NGC, 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 User shall apply in writing to NGC for NGC's approval of its proposed prefix.

(b) NGC shall consider the proposed prefix to see if it is the same as (or confusingly similar to) a prefix used by NGC or another User and shall, as soon as possible (and in any event within ten days), respond in writing to the User with its approval or disapproval.

(c) If NGC disapproves, it shall explain in its response why it has disapproved and will suggest an alternative prefix.

(d) If NGC has disapproved, then the User shall either notify NGC in writing of its acceptance of the suggested alternative prefix or it shall apply in writing to NGC with revised proposals and the above procedure shall apply to that application.

OC8A.4.3.7 The prefix allocation will be periodically circulated by NGC to all 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 or by an adequate physical separation;

(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 that the Safety Key has been secured in a Key Safe and the Key Safe Key will be retained in safe custody; or

(ii) maintained and/or secured by such other method which must be in accordance with the Local Safety Instructions of NGC or that 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 NGC or that 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.

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 may then request the implementation of Earthing by the Implementing Safety Co-ordinator, if agreed in section OC8A.5.1.

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** will be retained 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 NGC** or the **Relevant Transmission Licensee** or that **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 **NGC** 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 **NGC** and the **User**, with each **Safety Co-ordinator** issuing one 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. 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 NGC and 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 GB Transmission System and a 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 NGC and the respective 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 User’s System or such other local Connection Point as may be agreed between NGC and the 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 a User’s Site or a Transmission Site (as the case may be) on equipment of the User or NGC 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 then 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 a User’s Site or a Transmission Site (as the case may be) on equipment of the User or NGC, 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 a 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 a **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

OC8A.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.

OC8A.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.

OC8A.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.

OC8A.9 LOSS OF INTEGRITY OF SAFETY PRECAUTIONS

OC8A.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.

OC8A.10 SAFETY LOG

OC8A.10.1 NGC and 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.
OC8A - APPENDIX A

[National Grid Company] [__________________ CONTROL CENTRE/SITE]

RECORD OF INTER-SYSTEM SAFETY PRECAUTIONS (RISSP-R)
(Requesting 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]:

______________________________________________________________

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 this 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)
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

Log
OC8A.5.2.1

If reqd, provide isolation on other Systems

OC8A.5.1.2

ISC confirms isolation is established to RSC

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.6

See Appendix OC8A C2
**TESTING PROCESS**

Where testing affects another Safety Co-ordinator's System

Continue from OC8A Appendix C1

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)

No person will be so authorised until proposed test is completed (or cancelled) by the RSC

OC8A.6.1(a)(ii)

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)

Earthing not reapplied

OC8A.6.2(b)

RISSP cancellation process. See OC8A Appendix C3
RISSP CANCELLATION PROCESS

Appendix C3

Issue 3

OC8A - 17

[BIETTA GG-ACTIVE DATE]
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

If unable to agree Safety Precautions follow:

OC8A.8.1.3

ISC establishes Isolation (and Earthing if required) on his System

OC8A.8.2.1

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

Issue 3

OC8A - 18

[BETTA GO-ACTIVE DATE]
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 National Grid Company customers. Of particular note will be the agreed prefixes for the Record of Inter System Safety Precautions (RISSP) documents.
# PERMIT FOR WORK

## 1. Location

<table>
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<table>
<thead>
<tr>
<th>Equipment Identification</th>
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## 2. Precautions taken to achieve Safety from the System

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<th>Primary Earths</th>
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<th>Actions taken to avoid Danger by draining, venting, purging and containment or dissipation of stored energy</th>
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<table>
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<tr>
<th>Further precautions to be taken during the course of the work to avoid System derived hazards</th>
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## 3. Precautions that may be varied

| 
|-----------------|

## 4. Preparation

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<tr>
<th>Control Person(s) (Safety) giving Consent</th>
<th>Key Safe number*</th>
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| State whether this Permit for Work must be personally retained | yes | no |

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<th>Signed</th>
<th>Time</th>
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## 5. Issue & Receipt

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<th>Key Safe Number*</th>
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<th>Approved (ROMP)#/Card Safe#/ Procedure Number*</th>
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<th>Flags (No. off)*</th>
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<th>Issued (Signed)</th>
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<th>Time</th>
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<th>Competent Person</th>
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<th>Company</th>
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# delete as appropriate  *write N/A if not applicable  February 1995

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< End of OC8A >
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(This contents page does not form part of the Grid Code)

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SAFETY CO-ORDINATION IN SCOTLAND

OC8B.1 INTRODUCTION

OC8B specifies the standard procedures to be used by NGC, the Relevant Transmission Licensees and Users for the co-ordination, establishment and maintenance of necessary Safety Precautions when work is to be carried out on or near the GB Transmission System in Scotland or the System of a User in Scotland 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 Transmission Licensees and Users only in Scotland. OC8A specifies the procedures to be used by NGC and Users in England and Wales.

NGC shall procure that Relevant 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 User’s Site or a Transmission Site (as the case may be) on equipment of the User or the Relevant 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 Users.

OC8B.1.4 OC8B does not seek to impose a particular set of Safety Rules on Relevant Transmission Licensees and Users. The Safety Rules to be adopted and used by the Relevant Transmission Licensee and each 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 The Relevant Transmission Licensee may agree detailed site-specific operational procedures with 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

OC8B.1.7 Defined terms

OC8B.1.7.1 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. 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 retained 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 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 **Safety Rules** of the **Relevant Transmission Licensee** or that **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.

3. "**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 retained in safe custody; or
   
   (ii) maintained and/or secured in position by such other method which must be in accordance with the **Safety Rules** of the **Relevant Transmission Licensee** or that **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 User's Site or a Transmission Site (as the case may be) on equipment of the User or the Relevant Transmission Licensee (as the case may be) where the work or equipment is near to HV Apparatus on the Implementing Safety Coordinator's System.

OC8B.2.2 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.

OC8B.3 SCOPE

OC8B.3.1 OC8B applies to NGC, Relevant Transmission Licensees and to 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 NGC in relation to External Interconnections are set out in Interconnection Agreements with relevant persons for the External Interconnections.

OC8B.4 PROCEDURE

OC8B.4.1 Approval of Safety Rules

OC8B.4.1.1 (a) In accordance with the timing requirements of its Bilateral Agreement, each User will supply to the Relevant 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 Transmission Licensee will supply to each 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 Transmission Licensee and the User must have approved each other’s relevant Safety Rules in relation to Isolation and Earthing.

OC8B.4.1.2 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.

OC8B.4.1.3 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 Transmission Licensee and each 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 Transmission Licensee or a 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 Transmission Licensee or a User, as the case may be, that its Safety Co-ordinator(s) as a group are so authorised is dealt with, for Users, in CC.5.2 and for Relevant 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 GB Transmission System, give notice in writing to the Relevant 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 Transmission Licensee will, at the time of a User being connected to the GB Transmission System give notice in writing to that 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 Transmission Licensee or a 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 Transmission Licensee** and each **User**. That set out in **OC8B** Appendix A and designated as "RISSP-R", shall be used when the **Relevant 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**. Pro formas of RISSP-R and RISSP-I will be provided for use by **Relevant Transmission Licensees** staff.

OC8B.4.3.3 **Users** may either adopt the format referred to in **OC8B.4.3.2** or any other format which may be agreed between the **Relevant Transmission Licensee** and the **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 **User** or **Relevant 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 **User** or **Relevant 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 **User** shall apply in writing to **Relevant Transmission Licensee** for **Relevant Transmission Licensee**’s approval of its proposed prefix.

(b) **Relevant Transmission Licensee** shall consider the proposed prefix to see if it is the same as (or confusingly similar to) a prefix used by **Relevant Transmission Licensee** or another **User** and shall, as soon as possible (and in any event within ten days), respond in writing to the **User** with its approval or disapproval.

(c) If **Relevant Transmission Licensee** disapproves, it shall explain in its response why it has disapproved and will suggest an alternative prefix.

(d) If **Relevant Transmission Licensee** has disapproved, then the **User** shall either notify **Relevant Transmission Licensee** in writing of its acceptance of the suggested alternative prefix or it shall apply in writing to **Relevant 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 User's operational diagram and labelled as per the local instructions of each User.

OC8B.5.1.5  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 or by an adequate physical separation;
(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** that the **Safety Key** has been secured in a **Key Safe** and the **Key Safe Key** will be retained 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 Transmission Licensee** or that **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 Transmission Licensee** or that **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.

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** may then request the implementation of **Earthing** by the **Implementing Safety Co-ordinator**, if agreed in section OC8B.5.1.

**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** will be retained 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 Transmission Licensee** or that **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 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 Transmission Licensee* and the *User*, with each *Safety Co-ordinator* issuing one 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. 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 Transmission Licensee and 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 GB Transmission System and a 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 Transmission Licensee the 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 User's System or such other local Connection Point as may be agreed between the Relevant Transmission Licensee and the 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 User's Site or a Transmission Site (as the case may be) on equipment of the User or a Relevant 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 User's Site or a Transmission Site (as the case may be) on equipment of the User or a Relevant 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 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**.

**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 **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.

**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 Transmission Licensees and 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.
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

Work required across boundary or inadvertent connection or potential connection

RSC contacts ISC & each confirms authority to act pursuant to OC8B

RSC and ISC agree location of Safety Precautions

Log

OC8B.5.1 or OC8B.7

If unable to agree Safety Precautions follow:

OC8B.5.1.5

ISC establishes isolation on his System

Log

OC8B.5.2.1

If reqd, provide isolation on other Systems

OC8B.5.1.2

ISC confirms isolation is established to RSC

Log

OC8B.5.2.2

All isolation by RSC and ISC completed

OC8B.5.2.3 & OC8B.5.3.3

ISC initiates establishment of earthing (if agreed)

OC8B.5.3.1

If reqd, provide earthing on other Systems

OC8B.5.1.2

ISC confirms earthing is established to RSC

Log

OC8B.5.3.2 & OC8B.5.3.3

RISSP process completed for work on one side of the Connection Point

OC8B.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

OC8B.5.4.2 or OC8B.7

ISC completes RISSP-I
Details exchanged
RSC completes RISSP-R

OC8B.5.4.1 to OC8B.5.4.6

RSC can now authorise the work

OC8B.5.4.7

RISSP cancellation process
OC8B Appendix C3

OC8B.6

See OC8B Appendix C2

[BIETA GO-ACTIVE DATE]
TESTING PROCESS

Where testing affects another Safety Co-ordinator’s System

---

**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. **Continue from OC8B Appendix C1**

2. **Testing will not take place by RSC until**
   - **OC8B.6.1**

3. **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)**

4. **If testing required the removal of earthing the RISSP process is as set out in:**
   - **OC8B.6.2(b)**

5. **When test is complete or cancelled, RSC informs ISC**
   - **OC8B.6.2(a)**

6. **If testing required the removal of earthing the RISSP process is as set out in:**
   - **OC8B.6.2(b)**

7. **Earthing reapplied**
   - **OC8B.6.2(b)**

8. **RISSP can stay in force, if required**

---

**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**

---

**If testing required the removal of earthing the RISSP process is as set out in:**
- **OC8B.6.2(b)**

**Earthing not reapplied**
- **OC8B.6.2(b)**

**RISSP cancellation process. See OC8B Appendix C3**
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

OC8B.5.5.1

RSC informs ISC of RISSP document to be cancelled (including identity numbers)

OC8B.5.5.2

The RSC and ISC complete their respective parts of section 2.1 on RISSP-R and RISSP-I

OC8B.5.5.3

The RSC and ISC exchange the details including respective names, times and date

OC8B.5.5.3

RISSP is now cancelled

OC8B.5.5.3

Agree removal of Safety Precautions

OC8B.6.2(b)

Removal of earthing during testing across the Connection Point is as set out in:

OC8B.5.5.4

Agreed between RSC and ISC that all earths are removed

Removal being an internal matter for the party the ISC represents

OC8B.5.5.5

Removal of isolation agreed between RSC and ISC

OC8B.5.5.4

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

Log

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

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.

(ii) FURTHER PRECAUTIONS TO BE TAKEN DURING THE COURSE OF WORK TO AVOID SYSTEM DERIVED HAZARDS

Caution Notices have been affixed to all points of isolation

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: ……….
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>Time Date</td>
<td>Senior Authorised Person receiving suspended Document *</td>
</tr>
<tr>
<td>Time Date</td>
<td>Senior Authorised Person receiving reissued Document</td>
<td>Time Date</td>
</tr>
<tr>
<td>Signature</td>
<td>Name (Block Letters)</td>
<td>Senior Authorised Person reissuing document</td>
</tr>
</tbody>
</table>

*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 >

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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 but where there is no Total Shutdown or Partial Shutdown.

OC9.1.3 Joint System Incident Procedure

The establishment of a communication route and arrangements between senior management representatives of NGC 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 NGC and/or any Generator and/or any Supplier, for the purpose of "mitigating the effects of any civil emergency which may occur" (ie. for the purposes of planning for a civil emergency); a civil emergency is defined in the Act as "any natural disaster or other emergency which, in the opinion of the Secretary of State, is or may be likely to disrupt electricity supplies". Under the Energy Act 1976, the Secretary of State has powers to make orders and give directions controlling the production, supply, acquisition or use of electricity, where an Order in Council under section 3 is in force declaring that there is an actual or imminent emergency affecting electricity supplies. In the event that any such directions are given, or orders made under the Energy Act 1976, the provisions of the Grid Code will be suspended in so far as they are inconsistent with them.

OC9.2 OBJECTIVE

The overall objectives of OC9 are:

OC9.2.1 To achieve, 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 NGC and Users, who are authorised to make binding decisions on behalf of NGC or the relevant User, as the case may be, to communicate with each other in the situation described in OC9.1.3.
OC9.3 SCOPE

OC9.3.1 OC9 applies to NGC 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 NGC and Externally Interconnected System Operators is set out in the Interconnection Agreement with each Externally Interconnected System Operator.

OC9.4 BLACK START

OC9.4.1 Total Shutdown

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 NGC's directions relating to a Black Start.

OC9.4.2 Partial Shutdown

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 NGC'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, it may be necessary for NGC to 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.

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 NGC 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 NGC, the relevant Generator and Network Operator in accordance with the provisions of OC9.4.7.11. 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.

OC9.4.6 **Black Start Situation**

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

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 and eventually re-establishment of the complete Total System.

**NGC Instructions**

OC9.4.7.3 The procedures for a Black Start will, therefore, be those specified by NGC at the time. These will normally recognise any applicable Local Joint Restoration Plan. Users shall abide by NGC'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. NGC'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.

OC9.4.7.4 (a) During a Black Start situation, instructions in relation to Black Start Stations will be in the format required for Emergency Instructions in BC2, 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. For Power Stations which are not Black Start Stations, Bid-Offer Acceptances will recognise each BM Unit's Export and Import Limits and Dynamic Parameters as submitted pursuant to BC1 or BC2 (or as amended from time to time in accordance with the BCs).
(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 NGC. NGC will, where possible, either instruct Demand to be altered or will re-configure the NGCGb 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, NGC 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 NGC 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 NGC 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, NGC 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, NGC shall state whether or not it wishes the remainder of the Local Joint Restoration Plan to apply. If, not withstanding that NGC has stated that it wishes the remainder of the Local Joint Restoration Plan to apply, the Generator or the relevant Network Operator consider that NGC’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 NGC and the other parties to the Local Joint Restoration Plan to this effect and NGC 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 NGC, 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) NGC 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.
NGC will carry out switching on the NGC GB Transmission System and other actions as set out in the Local Joint Restoration Plan.

Following notification from the Generator that the Black Start Station is ready to accept load, NGC 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 direct 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.

Operation in accordance with the Local Joint Restoration Plan will be terminated by NGC (by notifying the relevant Users) prior to connecting the Power Island to other Power Islands, or to the User System of another Network Operator, or to the synchronising of Gensets at other Power Stations. 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 NGC 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 NGC.

Interconnection of Power Islands

NGC 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.

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 NGC 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 NGC of their actions and will not Re-Synchronise to the NGC GB Transmission System or any User's System which is already Synchronised to the NGC GB Transmission System without NGC's agreement.

Conclusion of Black Start

The conclusion of the Black Start, and the time of the return to normal operation of the Total System, will be determined by NGC who shall inform Users (or where there has been a Partial Shutdown, Users which in NGC's opinion need to be informed) that the Black Start situation no longer exists and that normal operation of the Total System has begun.
Externally Interconnected System Operators

OC9.4.7.10 During a Black Start, NGC 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.

OC9.4.7.11 Local Joint Restoration Plan establishment

(a) In relation to each Black Start Station, NGC, 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 OC9.4.7.11 into the Grid Code a local plan covering the procedures to be covered in a Local Joint Restoration Plan is in existence and agreed, NGC 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 OC9.4.7.11(b) shall apply. If it is not agreed to be so consistent, then the provisions of OC9.4.7.11(b) shall apply as if there is no Local Joint Restoration Plan in place.

(b) Where the need for a Local Joint Restoration Plan arises when there is none in place, the following provisions shall apply:-

(i) NGC, 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 NGC. NGC 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 NGC and each User should a Black Start situation arise.

(iv) Each Local Joint Restoration Plan shall be prepared by NGC 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 NGC 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 NGC and on behalf of each relevant User by way of written confirmation of its accuracy.

(viii) Once agreed under this OC9.4.7.11, 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 NGC 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 NGC to each User which is a party to it accompanied by a note indicating the date of implementation.

(x) NGC and Users must make the Local Joint Restoration Plan readily available to the relevant operational staff.

(xi) If NGC, 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 NGC) initiate a discussion between NGC and the relevant Users to seek to agree the relevant change. If a User becomes so aware, it shall contact NGC who will then initiate such discussions. The principles applying to establishing a new Local Joint Restoration Plan under this OC9.4.7.11 shall apply to such discussions and to any consequent changes.

OC9.5 RE-SYNCHRONISATION OF DE-SYNCHRONISED ISLANDS

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, NGC will instruct Users to regulate generation or Demand, as the case may be, to enable the De-Synchronised Islands to be Re-Synchronised and NGC 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.

(c) In accordance with the provisions of the BCs, NGC 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 to the Re-Synchronising of parts of the System following a Total or Partial Shutdown, as indicated in OC9.4.

OC9.5.2 Options

Embedded 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) NGC, each Generator with Synchronised (or connected and available to generate although not Synchronised) Genset(s) in the De-Synchronised Island and the Network Operator in whose User System the De-Synchronised Island is situated shall exchange information as set out in this OC9.5.2.1 to enable NGC 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 NGC from the Generator will cover its relevant operational parameters as outlined in the BCs and from NGC 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 NGC will comprise data on Demand in the De-Synchronised Island, including data on any constraints within the De-Synchronised Island.

(d) NGC will keep the Network Operator informed of the Bid-Offer Acceptances or Emergency Instructions it is issuing to Genset(s) within the De-Synchronised Island.

OC9.5.2.2 Direct Data

(a) NGC 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 in whose User System the Power Station is situated 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 NGC 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 Network Operator's User System, if agreed between NGC and the Network Operator and the relevant Generator(s), whereby upon a defined fault(s) occurring, manual or automatic control features will operate to protect the 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 NGC will need to consider its impact on the operation of the NGC GB 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, NGC 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, NGC, the Network Operator and relevant Generator(s) will operate in accordance with that OC9 De-Synchronised Islands Procedure unless NGC 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 NGC will instruct the relevant Users and the Users will comply with NGC'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, NGC, 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) NGC, 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 NGC or a User, and the party which identifies such a need will notify all affected Users (and NGC, if that party is a User), and NGC 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 NGC and the Network Operator then the OC9 De-Synchronised Island Procedure may cover all relevant Grid Supply Points.

(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 NGC and each User should a De-Synchronised Island arise; and

(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.

(d) Each OC9 De-Synchronised Island Procedure shall be prepared by NGC 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 NGC to the Users involved for confirmation of its accuracy.

(g) The OC9 De-Synchronised Island Procedure shall then be signed on behalf of NGC 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 NGC and the relevant Users as if it were part of the Grid Code.

(i) Once signed, a copy will be distributed by NGC to each User which is a party accompanied by a note indicating the issue number and the date of implementation.

(j) NGC 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, NGC 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 NGC, 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 NGC) initiate a discussion between NGC 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 NGC who will then initiate such discussions.
(m) If in relation to any discussions, agreement cannot be reached between NGC and the relevant Users, NGC 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 NGC 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. NGC will instruct the relevant Users and the Users will comply with NGC'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) NGC 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.

(d) If agreement cannot be reached between NGC and the relevant Users after a reasonable period of time, the existing procedure will cease to apply and NGC 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 NGC 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. NGC will instruct the relevant Users and the Users will comply with NGC's instructions as provided in OC9.5.3.

OC9.5.5 Where the NGCGB Transmission System is Out of Synchronism with the transmission system of an Externally Interconnected System Operator, NGC 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 NGCGB Transmission System.

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 NGC 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 NGCGB Transmission System, and
in the case of an Event on the NGCGB 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 NGCGB 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 NGC, and

(ii) NGC 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 NGC 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 NGCGB 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, NGC or a User, as the case may be, will, if it considers necessary, telephone the User or NGC, 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, NGC or a User, as the case may be, will determine whether or not the Event is a Joint System Incident, and, if so, NGC and/or the User may set up an Incident Centre in order to avoid overloading the existing NGC or that User's, as the case may be, operational/control arrangements.

OC9.6.5 Where NGC has determined that an Event is a Joint System Incident, NGC shall, as soon as possible, notify all relevant Users that a Joint System Incident has occurred and, if appropriate, that it has established an Incident Centre and the telephone number(s) of its Incident Centre if different from those already supplied pursuant to OC9.6.2.

OC9.6.6 If a User establishes an Incident Centre it shall, as soon as possible, notify NGC that it has been established and the telephone number(s) of the Incident Centre if different from those already supplied pursuant to OC9.6.2.

OC9.6.7 NGC's Incident Centre and/or the User's Incident Centre will not assume any responsibility for the operation of the NGCGB Transmission System or User's System, as the case may be, but will be the focal point in NGC or the User, as the case may be, for:-

(a) the communication and dissemination of information between NGC and the senior management representatives of User(s); or
(b) between the **User** and the senior management representatives of **NGC**, 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 **NGC** and **Users** will continue to be used.

**OC9.6.8** All communications between the senior management representatives of the relevant parties with regard to **NGC's** role in the **Joint System Incident** shall be made via **NGC's Incident Centre** if it has been established.

**OC9.6.9** All communications between the senior management representatives of **NGC** and a **User** with regard to that **User's** role in the **Joint System Incident** shall be made via that **User's Incident Centre** if it has been established.

**OC9.6.10** **NGC** will decide when conditions no longer justify the need to use its **Incident Centre** and will inform all relevant **Users** of this decision.

**OC9.6.11** Each **User** which has established an **Incident Centre** will decide when conditions no longer justify the need to use that **Incident Centre** and will inform **NGC** of this decision.

<End of OC9>
## OPERATING CODE NO.10

**EVENT INFORMATION SUPPLY**

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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 NGC 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 NGC 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 NGC and the relevant Users agree.

OC10.3 SCOPE

OC10.3.1 OC10 applies to NGC 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; and

(c) Non-Embedded Customers.

The procedure for Event information supply between NGC 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 NGC

In the case of an Event which was initially reported by a User to NGC orally and subsequently determined by NGC to be a Significant Incident, and accordingly notified by NGC to a User pursuant to OC7, the User will give a written report to NGC, in accordance with OC10. NGC 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 NGC 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 NGCGB.
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 NGC to Users

In the case of an Event which was initially reported by NGC to a User orally and subsequently determined by the User to be a Significant Incident, and accordingly notified by the User to NGC pursuant to OC7, NGC 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 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 User System is connected to its System) (if the Significant Incident on the NGC GB 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 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 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 NGC GB Transmission System caused or exacerbated it).

OC10.4.1.3 Form

A report under OC10.4.1 shall be sent to NGC 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. NGC 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 NGC or the User, as the case may be, within 2 hours of NGC or the User, as the case may be, receiving oral notification under OC7. If this is not possible, the User or NGC, 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 NGC, 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, NGC 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 NGC 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 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 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 NGC 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 **NGC**, 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 - Frequency** response (MW correction achieved subsequent to the **Significant Incident**).

7. **Generating Unit - Mvar** performance (change in output subsequent to the **Significant Incident**).

8. Estimated time and date of return to service.

< End of OC10>
# OPERATING CODE NO.11

NUMBERING AND NOMENCLATURE OF HIGH VOLTAGE APPARATUS AT CERTAIN SITES

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OC11.1 INTRODUCTION

OC11.1.1 Operating Code No.11 ("OC11") sets out the requirement that:

(a) **NGCTransmission** HV Apparatus on Users' Sites; and

(b) User HV Apparatus on **NGCTransmission** Sites;

shall have numbering and nomenclature in accordance with the system used from time to time by NGC.

OC11.1.2 The numbering and nomenclature (if required under the system of numbering and nomenclature used from time to time by NGC) of each item of HV Apparatus shall be included in the Operation Diagram prepared for each **NGCTransmission** 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 NGC.

OC11.3 SCOPE

OC11.3.1 **OC11** applies to NGC and to Users, which in **OC11** means:-

(a) Generators;

(b) Network Operators; and

(c) Non-Embedded Customers.
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 NGC (in England and Wales) or a Relevant Transmission Licensee (in Scotland) but occupied by a User (as aforesaid), the site is a User Site.

OC11.4.1.2 The term "NGC Transmission Site" means a site owned (or occupied pursuant to a lease, licence or other agreement) by NGC (in England and Wales) or by a Relevant Transmission Licensee (in Scotland) in which there is a Connection Point. For the avoidance of doubt, where a site is owned by a User but occupied by NGC (in England and Wales) or a Relevant Transmission Licensee (in Scotland) (as aforesaid), the site is an NGC Transmission Site.

OC11.4.2 **NGC Transmission HV Apparatus on Users’ Sites**

(a) **NGC Transmission** HV Apparatus on Users’ Sites shall have numbering and nomenclature in accordance with the system used from time to time by NGC;

(b) when NGC (for sites in England and Wales) or the Relevant Transmission Licensee (for sites in Scotland) is to install its HV Apparatus on a User’s Site, NGC 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 NGC 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 NGC 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 NGC, or, to the extent that it does, that the relevant other numbering and/or nomenclature will be changed before installation of the NGC 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 NGC Transmission HV Apparatus which is either already on that User Site or which NGC has notified that User will be installed on that User Site.

OC11.4.3 **User HV Apparatus on NGC Transmission Sites**

(a) User HV Apparatus on NGC Transmission Sites shall have numbering and nomenclature in accordance with the system used from time to time by NGC;
(b) when a User is to install its HV Apparatus on an NGC Transmission Site, or it wishes to replace existing HV Apparatus on an NGC 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 NGC 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 NGC 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) NGC will respond in writing to the User within one month of the receipt of the notification stating whether or not NGC 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 NGC in its reasonable opinion has decided that it needs to change the existing numbering or nomenclature of NGC Transmission HV Apparatus on a User’s Site or of User’s HV Apparatus on an NGC Transmission Site:

(a) the provisions of paragraph OC11.4.2 shall apply to such change of numbering or nomenclature of NGC 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 an NGC Transmission Site, NGC 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 that 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 NGC 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 NGC’s then current numbering and nomenclature system in order to assist them in planning the numbering and nomenclature for their HV Apparatus on NGC Transmission Sites.

OC11.4.6 When either NGC or a User installs HV Apparatus which is the subject of OC11, NGC or the User, as the case may be, installing such HV Apparatus 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 NGC (for sites in England and Wales), or a Relevant Transmission Licensee (for sites in Scotland) installs HV Apparatus which is the subject of OC11, NGC shall be responsible for the provision and erection of a clear and unambiguous labelling showing the numbering and nomenclature. Where NGC changes the numbering and/or nomenclature of its HV Apparatus which is the subject of OC11, NGC 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, NGC 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 CEGB 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 NGC 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 NGCGB 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 NGC 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 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 NGCGB Transmission System; or

(b) by NGC which may have an effect on the Total System or any part of the Total System (in addition to the NGCGB 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 NGC 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 NGC and to Users, which in OC12 means:-

(a) Generators;

(b) Network Operators; and

(c) Non-Embedded Customers.

The procedure for the establishment of System Tests on the NGC GB 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.

OC12.4 PROCEDURE

OC12.4.1 Proposal Notice

OC12.4.1.1 Where a User has decided that it would like to undertake a System Test it shall submit a notice (a "Proposal Notice") to NGC at least twelve months in advance of the date it would like to undertake the proposed System Test.

OC12.4.1.2 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.

OC12.4.1.3 If NGC 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. NGC 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 NGC wishes to undertake a System Test, NGC shall be deemed to have received a Proposal Notice on that System Test.

OC12.4.1.5 Where, under OC12, NGC is obliged to notify or contact the Test Proposer, NGC will not be so obliged where it is NGC 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 NGC and the Test Proposer, need only do so once where NGC 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 NGC will determine, in its reasonable estimation, which Users, other than the Test Proposer, may be affected by the proposed System Test. If NGC 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 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 NGC 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 NGC decides, in its reasonable opinion, that the NGC GB 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 NGC after consultation with the Test Proposer and the Users identified under OC12.4.2.1.

(b) Where NGC decides, in its reasonable opinion, that the NGC GB 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 NGC.

(c) NGC 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 NGC then the proposed System Test will not take place.

OC12.4.2.3 NGC 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 NGC 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 NGC 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 NGC 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 NGC.

OC12.4.2.4 The Preliminary Notice will be sent within one month of the later of either the receipt by NGC of the Proposal Notice, or of the receipt of any further information requested by NGC under OC12.4.1.3. Where NGC 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 NGC within one month of the date on which the Preliminary Notice was sent to the User by NGC. 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 NGC will notify all Users identified by it under OC12.4.2.1 accordingly.

OC12.4.2.6 NGC 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 NGC 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 NGC 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
NGC 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 NGC under OC12.4.2.1, the Test Proposer and NGC (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 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 NGC, the Test Proposer and to each User identified by NGC 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 NGC, the Test Proposer and each User identified by NGC 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), NGC and each User identified by NGC 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), NGC and all Users identified by NGC 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 NGC 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 **NGC** under OC12.4.2.1, **NGC** 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.

< End of OC12 >
# BALANCING CODE No 1
## PRE GATE CLOSURE PROCESS

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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 by each BM Participant;
(b) the submission of certain System data by each Network Operator; and
(c) the provision of data by NGC,

in the period leading up to Gate Closure.

BC1.2 OBJECTIVE

The procedure for the submission of BM Unit Data is intended to enable NGC to assess which BM Units are expected to be operating in order that NGC can ensure (so far as possible) the integrity of the NGC GB Transmission System, and the security and quality of supply.

BC1.3 SCOPE

BC1 applies to NGC and to Users, which in this BC1 means:-

(a) BM Participants;
(b) Externally Interconnected System Operators; and
(c) Network Operators.

BC1.4 SUBMISSION OF BM UNIT DATA

In the case of BM 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 by Users to NGC 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 NGC.
(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** (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 **NGC** by the submission of a revision to **Export and Import Limits** in relation to the **BM 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 **NGC** during the outage will be conducted by telephone; and

(iii) no data will be transferred from **NGC** 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 **NGC** 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. **NGC** 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 **NGC** for operational planning will be determined from the most recent data that has been received by **NGC** 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 **NGC** under the **Grid Code** will also be utilised by **NGC**. 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 **NGC** at 11:00 hours each day for each **Settlement Period** of the next following **Operational Day**, in respect of **BM Units**:-
(i) with a **Demand Capacity** with a magnitude of 50MW or more; or in England and Wales or 5MW or more in Scotland; or

(ii) comprising **Generating Units** and/or **CCGT Modules** at **Large Power Stations** and **Medium Power Stations**; 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.

**Physical Notifications** may be submitted to NGC by **BM Participants**, for the **BM 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** should normally be consistent with the **Dynamic Parameters** and **Export and Import Limits** and must not reflect any **BM Unit** proposing to operate outside the limits of its **Demand Capacity** and **Generation Capacity** and, in the case of a **BM Unit** comprising a **Generating Unit** or **CCGT Module**, its **Registered Capacity**.

These **Physical Notifications** provide, amongst other things, indicative **Synchronising** and **De-Synchronising** times to NGC in respect of any **BM Unit** comprising a **Generating Unit** or **CCGT Module** 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 NGC 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 NGC 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**, submit to NGC 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 NGC 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 **NGCGB Transmission System** for a **BM 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**, submit to NGC 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 NGC in relation to **Bid-Offer Data**, which would otherwise apply to those **Settlement Periods**. The submitted **Bid-Offer Data** will be utilised by NGC 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, submit to NGC 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 NGC.

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 NGC 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.

(f) **Other Relevant Data**
By 11:00 hours each day each BM Participant, in respect of each of its BM Units for which Physical Notifications are being submitted, shall, if it has not already done so, submit to NGC 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; and

(v) details of any other factors which NGC 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).

(g) **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 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 NGC in relation to its BM Units is accurate at all times. Revisions to BM Unit Data for any period of time up to Gate Closure should be submitted to NGC as soon as reasonably practicable after a change becomes apparent to the BM Participant. NGC 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 NGC’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 NGC 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 in accordance with BC1.4.2 in respect of an Operational Day, is received by NGC by 11:00 hours on the day before that Operational Day, NGC 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 NGC, state otherwise (in which case (b) applies); and

(b) for all other BM 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 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 so submitted fails the data validity and consistency checking, this will result in the rejection of all data submitted for that BM Unit included in the electronic data file containing that data item and that BM 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 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
occurs, details will be made available to the relevant **BM Participant** via the electronic data communication facilities.

**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 **NGC** 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 **NGC** 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 **NGC** 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 **NGC** shall notify the **Externally Interconnected System Operator** accordingly.

**BC1.5 INFORMATION PROVIDED BY NGC**

**NGC** 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 **NGC** 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. **NGC** 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, **NGC** will make available to **Users** a forecast of **GB National Demand** and the **Demand** for a number of pre-determined constraint groups (which may be updated from time to time, as agreed between **NGC** and **BSCCo**) for each **Settlement Period** of the next following **Operational Day**. Normally by 1200 hours each day, **NGC** will make available to **Users** a forecast of **NGC GB 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, **NGC** will make available to **Users** an **Indicated Margin** and an **Indicated Imbalance** for each **Settlement Period** of the next following **Operational Day**. **NGC** 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**

**NGC** will provide updated information on **Demand** and other information at various times throughout each day, as detailed in Appendix 2. **NGC** 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 NGC 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, NGC 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 NGC 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 NGC GB Transmission System must be secured) or loss of import from or sudden export to External Interconnections. NGC will allocate Operating Reserve to the appropriate BM 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, NGC will monitor the total of the Maximum Export Limit component of the Export and Import Limits received against forecast NGC GB 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 NGC's reasonable opinion, anticipated to be insufficient, NGC will send (by such data transmission facilities as have been agreed) a NGC GB 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 NGC’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 NGC GB 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 NGC GB 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 NGC, 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 NGCGB Transmission System Warning - Inadequate System Margin may be superseded by a NGCGB Transmission System Warning - High Risk of Demand Reduction and vice-versa.

(h) If the continuing monitoring identifies that the System Margin is anticipated, in NGC's reasonable opinion, to be sufficient for the period for which previously a NGCGB Transmission System Warning had been issued, NGC will send (by such data transmission facilities as have been agreed) a Cancellation of NGCGB Transmission System Warning to each User who had received a NGCGB Transmission System Warning - Inadequate System Margin or High Risk of Demand Reduction for that period. The issue of a Cancellation of NGCGB Transmission System Warning is not an assurance by NGC that in the event the System Margin will be adequate, but reflects NGC's reasonable opinion that the insufficiency is no longer anticipated.

(i) If continued monitoring indicates the System Margin becoming inadequate NGC may issue further NGCGB Transmission System Warnings - Inadequate System Margin or High Risk of Demand Reduction.

(j) NGC may issue a NGCGB 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 NGC may determine and must be capable of sustaining this response.

(b) NGC will monitor the total of Physical Notifications of exporting BM Units 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, NGC 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 NGC'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 NGC’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 NGC’s reasonable opinion, likely to be insufficient NGC 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. NGC 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 NGC; 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. NGC 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 NGC in writing, confirmation or notification of the following in respect of the next Operational Day:

(i) constraints on its User System which NGC may need to take into account in operating the NGCGB Transmission System. In this BC1.6.1 the term "constraints" shall include restrictions on the operation of Embedded CCGT Units as a result of the User System to which the CCGT Unit 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 NGC can result in the violation of any such constraint on the User System.

(ii) the requirements of voltage control and Mvar reserves which NGC may need to take into account for System security reasons.
(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 on the higher voltage side of the generator step-up transformer) 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 NGC in writing any revisions to the information submitted under this BC1.6.1.

**BC1.6.2 Notification of Times to Network Operators**

NGC will make available indicative Synchronising and De-Synchronising times to each Network Operator, but only relating to BM Units comprising a Generating Unit or a CCGT Module Embedded within that Network Operator's User System and those Gensets directly connected to the NGC Transmission System which NGC has identified under OC2 as being those which may, in the reasonable opinion of NGC, affect the integrity of that User System. If in preparing for the operation of the Balancing Mechanism, NGC becomes aware that a BM Unit directly connected to the NGC 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 or a CCGT Module, it had not so identified under OC2, then NGC 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 NGC 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 NGC Transmission System in accordance with the Licence Standards and NGC 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. They may also include selection of "System to Genset" or "System to CCGT Unit", as the case may be, intertrip schemes for stability or thermal reasons.

(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 **NGC** 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.
APPENDIX 1

BM UNIT DATA

More detail about valid values required under the Grid Code for BM Unit Data may be identified by referring to the Data Validation, Consistency and Defaulting Rules. In the case of Embedded BM Units, the BM Unit Data shall represent the value at the relevant Grid Supply Point.

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 NGC. 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, TAGENT, BMUNIT04</td>
<td>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, TAGENT, BMUNIT04</td>
<td>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, TAGENT, BMUNIT04</td>
<td>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 NGC GB 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 NGC GB 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, TAGENT, BMUNIT01</td>
<td>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, TAGENT, BMUNIT01</td>
<td>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, TAGENT, BMUNIT04</td>
<td>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:

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>Pair ID</th>
<th>From Level (MW)</th>
<th>To Level (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</td>
<td>4 , 30</td>
<td>30</td>
<td>40</td>
<td>35</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</td>
<td>3 , 20</td>
<td>20</td>
<td>35</td>
<td>30</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</td>
<td>2 , 40</td>
<td>40</td>
<td>32</td>
<td>27</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</td>
<td>1 , 50</td>
<td>50</td>
<td>30</td>
<td>25</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</td>
<td>-1 , -40</td>
<td>-40</td>
<td>25</td>
<td>20</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</td>
<td>-2 , -30</td>
<td>-30</td>
<td>23</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This example of Bid-Offer data is illustrated graphically below:

![Bid-Offer Data 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 **NGCGB 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 **NGCGB 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

| CCGT MODULE ACTIVE POWER | CCGT GENERATING UNITS AVAILABLE |  |  |  |  |  |  |
|--------------------------|----------------------------------|---|---|---|---|---|
| MW                       | 1st GT  | 2nd GT  | 3rd GT  | 4th GT  | 5th GT  | 6th GT  | 1st ST  | 2nd ST  | 3rd ST  |
| 0MW to 150MW             | /       | /       | /       | /       | /       | /       | /       | /       | /       |
| 151MW to 250MW           | /       | /       | /       | /       | /       | /       | /       | /       | /       |
| 251MW to 300MW           | /       | /       | /       | /       | /       | /       | /       | /       | /       |
| 301MW to 400MW           | /       | /       | /       | /       | /       | /       | /       | /       | /       |
| 401MW to 450MW           | /       | /       | /       | /       | /       | /       | /       | /       | /       |
| 451MW to 550MW           | /       | /       | /       | /       | /       | /       | /       | /       | /       |

**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. NGC will respond to this request by 1600 hours on the day of receipt of the request. If NGC 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 NGC 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 NGC 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 **NGC** 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 **NGC** 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, **NGC** 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 **NGC** in accordance with the relevant provisions of **BC1**.
APPENDIX 2

DATA TO BE MADE AVAILABLE BY NGC

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 GB 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 NGC GB Transmission System Demand.

ii) Initial National Indicated Imbalance

This is the difference between the sum of Physical Notifications for BM Units comprising Generating Units or CCGT Modules and the forecast of NGC GB Transmission System Demand.

iii) Forecast of NGC GB 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 NGC. Information to be released includes:-

National Information

i) National Indicated Margin;

ii) National Indicated Imbalance;
iii) Updated forecast of **NGC GB 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** or **CCGT 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 >
# BALANCING CODE No 2

POST GATE CLOSURE PROCESS

## CONTENTS

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

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<tr>
<th>Paragraph No/Title</th>
<th>Page Number</th>
</tr>
</thead>
<tbody>
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<td>BC2-13</td>
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<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 in the absence of any instructions from NGC;

b) the acceptance by NGC of Balancing Mechanism Bids and Offers,

c) the calling off by NGC of Ancillary Services;

d) the issuing and implementation of Emergency Instructions; and

e) the issuing by NGC of other operational instructions and notifications.

In addition, BC2 deals with any information exchange between NGC 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 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 NGC as far as possible to maintain the integrity of the NGC GB Transmission System together with the security and quality of supply.

BC2.3 SCOPE

BC2 applies to NGC 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 NGC shall use, together with the other information available to it, in assessing:-

(a) which bids and offers to accept;

(b) which BM Units to instruct to provide Ancillary Services;

(c) the need for and formulation of Emergency Instructions; and

(d) other operational instructions and notifications which NGC 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, 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, NGC 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 NGC, and will reflect any Demand Control which has also been so notified. NGC may issue new or revised NGCGB 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 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;

(b) instructions by NGC in relation to that BM Unit which require, or compliance with which would result in, a variation in output or input of that BM Unit; or

(c) 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 which requires a variation in output or input of that BM 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) 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 prevailing at Gate Closure (except for variations arising from the issue of Bid-Offer Acceptances or instructions by NGC as outlined above) for any BM Unit post Gate Closure must be notified to NGC 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 NGC 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 NGC 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 is to be Synchronised or De-Synchronised unless:-

(a) a Physical Notification had been submitted to NGC prior to Gate Closure indicating that a Synchronisation or De-Synchronisation is to occur; or

(b) NGC has issued a Bid-Offer Acceptance requiring Synchronisation or De-Synchronisation of that BM Unit.

BC2.5.2.3 BM Participants must only Synchronise or De-Synchronise BM Units;

(a) at the times indicated to NGC, 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 intertrip schemes or Low Frequency Relay operations or an Ancillary Service pursuant to an Ancillary Services Agreement. For a BM Unit in relation to which the intertrip has been instructed to be switched into service under BC2.10 in order to protect the NGC GB Transmission System, if it is De-Synchronised due to an operation of the intertrip that is not due to a fault at the BM Unit then a Bid-Offer Acceptance will be treated as having been issued. This will reflect the operation of the intertrip in order to form the Bid-Offer Acceptance data to be given to the BMRA under the BSC.

BC2.5.2.4 De-Synchronisation may also take place without prior notification to NGC as a result of plant breakdowns or if it is done purely on safety grounds (relating to personnel or plant). If that happens NGC 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** is to take place without **NGC**’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 **NGC** (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 **NGC** (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 **NGC**’s agreement.

**NGC** will either agree to the **Synchronisation** or issue a **Bid-Offer Acceptance** in accordance with **BC2.7** to delay the **Synchronisation**. **NGC** may agree to an earlier **Synchronisation** if **System** conditions allow.

**BC2.5.2.5 Notification of Times to Network Operators**

**NGC** 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 **NGCGB Transmission System** which **NGC** has identified under **OC2** and/or **BC1** as being those which may, in the reasonable opinion of **NGC**, 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 **NGC** 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 **NGC**.

**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 **NGC** 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 **NGC** (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 **NGC**. For the avoidance of doubt, the **Dynamic Parameters** submitted to **NGC** 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**.

**BC2.5.3.2**

Revisions to **Export and Import Limits** or **Other Relevant Data** supplied (or revised) under **BC1** must be notified to **NGC** 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** to ensure that an accurate assessment of **BM Unit** capability is available to **NGC** 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** in the circumstances described in BC2.5.2.4 if the **BM 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** 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 **NGC** via the **Control Point** of a revision to the **Export and Import Limits**, if appropriate, of the **BM Unit**, using reasonable endeavours to give a minimum of 5 minutes notice of its intention to return to its **Physical Notification**. 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 **NGC’s** agreement.

**BC2.5.4 Operation in the absence of instructions from NGC**

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) in the absence of any Mvar **Ancillary Service** instructions, the Mvar output of each **Synchronised Genset** should be 0 Mvar upon **Synchronisation** at the circuit-breaker where the **Genset** is **Synchronised**;

(c) the excitation system, unless otherwise agreed with **NGC**, 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 **NGC**. 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 **NGC** 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);

(d) In the absence of any Mvar **Ancillary Service** instructions, the Mvar output of each **Genset** 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**.

(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 **NGC** 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 **NGC**.
NGC 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.

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 England and Wales** or less than **5MW in Scotland** or comprising **Generating Units** and/or **CCGT Modules** at a **Small Power Station** notifies NGC 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 greater **in England and Wales** or **5MW or greater in Scotland** or comprising **Generating Units** and/or **CCGT Modules** at a **Medium Power Station** or **Large Power Station** notifies NGC 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 NGC 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.
(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** in respect of that **BM 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 **NGC** within two minutes of the issue of the **Bid-Offer Acceptance**, then **NGC** 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 **NGC** 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), **NGC** 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.

**BC2.6.2 Communication with Control Points in Emergency Circumstances**

**NGC** will issue **Emergency Instructions** direct to the **Control Point** for each **BM Unit** in **England and Wales** **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**

**NGC** 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**

**NGC** 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. Plant failure or similar problems causing significant deviation from Physical Notification should be notified to NGC by the submission of a revision to Export and Import Limits in relation to the BM 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 NGC during the outage will be conducted by telephone;

(c) NGC will issue Bid-Offer Acceptances by telephone; and

(d) no data will be transferred from NGC 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 NGC

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) NGC 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 NGC 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 NGC 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 NGC 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, NGC 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, NGC will seek to contact the Control Point for the BM Unit. NGC must then, within 15 minutes of issuing the Bid-Offer Acceptance, withdraw the Bid-Offer Acceptance or log the Bid-Offer Acceptance as confirmed. NGC will only log a rejected Bid-Offer Acceptance as confirmed following discussion and if the reason given is, in NGC’s reasonable opinion, not acceptable and NGC 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 NGC with no more than the delay allowed for by the Dynamic Parameters unless the BM Unit has given notice to NGC 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 NGC 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), NGC 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 NGC 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.

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 NGC

(a) Ancillary Service instructions may be issued at any time.

(b) NGC is entitled to assume that each BM Unit is available in accordance with the BM 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 NGC 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.

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 will comply in accordance with BC2.8.1 with all Ancillary Service instructions relating to Reactive Power properly given by NGC within 2 minutes or such longer period as NGC may instruct, and all other Ancillary Service instructions without delay, unless the BM Unit has given notice to NGC 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) In the event that while carrying out the Ancillary Service instructions an unforeseen problem arises caused by safety reasons (relating to personnel or plant), NGC must be notified immediately by telephone and this may lead to revision of BM Unit Data in accordance with BC2.5.3.

BC2.9 EMERGENCY CIRCUMSTANCES

BC2.9.1 Emergency Actions

BC2.9.1.1 In certain circumstances (as determined by NGC in its reasonable opinion) it will be necessary, in order to preserve the integrity of the NGC GB Transmission System and any synchronously connected External System, for NGC 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 NGCGB 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 Generating Units 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.

BC2.9.1.3 In the case of BM Units in England or Wales, Great Britain, Emergency Instructions will be issued by NGC direct to the User at the Control Point for the BM 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 NGC 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 NGC 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 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.

BC2.9.2.3 In all cases under this BC2.9 except BC2.9.1.2 (e) where NGC 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 will not be treated as a Bid-Offer Acceptance.

BC2.9.2.4 In the case of BC2.9.1.2 (e) (ii) where NGC issues an Emergency Instruction under a Maximum Generation Service Agreement payment will be dealt with under the Maximum Generation Service Agreement.
BC2.9.3 Examples of Emergency Instructions

BC2.9.3.1 In the case of a BM Unit, Emergency Instructions may include an instruction for the BM 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; or

(b) an instruction to trip Mills or to Part Load a Generating Unit; or

(c) an instruction to Part Load a CCGT 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 NGC in NGC’s reasonable opinion); or

(e) an instruction to generate outside normal parameters, as allowed for in a Maximum Generation Service Agreement.

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 NGC is unable to satisfy the required System NRAPM or Localised NRAPM by following the process described in BC1.5.5, NGC will issue an Emergency Instruction to exporting BM Units for De-Synchronising on the basis of Bid-Offer Data submitted to NGC in accordance with BC1.4.2(d).

BC2.9.4.2 In the event that NGC is unable to differentiate between exporting BM Units according to Bid-Offer Data, NGC 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 NGC is still unable to differentiate between exporting BM Units, having considered all the foregoing, NGC 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, NGC shall not consider in such determination (and accordingly shall not instruct to De-Synchronise) any Generating Unit within an Existing Gas Cooled Reactor Plant.

**BC2.9.4.5** NGC shall be permitted to instruct a Generating Unit 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 NGC 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 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 NGC 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 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, NGC 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 Generating Units

**BC2.9.5.1** If, post Gate Closure, NGC determines, in its reasonable opinion, from the information then available to it (including information relating to Generating Unit 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 NGC 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 NGC'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 NGC may instruct such of the Existing Gas Cooled Reactor Plant to De-Synchronise as it is, in NGC’s reasonable opinion, necessary to De-Synchronise and for the period for which the De-Synchronising is, in NGC’s reasonable opinion, necessary.

BC2.9.5.2 If in NGC’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 NGC takes any available action to increase the Active Energy transferred into its External System, or reduce the Active Energy transferred into the NGCGB 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 NGC providing this does not require a reduction of Demand on the NGCGB Transmission System, or lead to a reduction in security on the NGCGB Transmission System.

(b) NGC may request that an Externally Interconnected System Operator takes any available action to increase the Active Energy transferred into the NGCGB 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 NGCGB 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 NGC’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 NGC will, as soon as it is reasonably able to do so, issue a NGC Computing System Failure notification by telephone or such other means agreed between Users and NGC indicating the likely duration of the outage.

BC2.9.7.2 During the period of any such outage, the following provisions will apply:

(a) NGC will issue further NGC Computing System Failure notifications by telephone or such other means agreed between Users and NGC 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
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 (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 NGC by telephone by the submission of a revision to Export and Import Limits in relation to the BM Unit so affected;

(c) Revisions to Export and Import Limits and to Dynamic Parameters should be notified to NGC by telephone and will be recorded for subsequent use;

(d) NGC will issue Bid-Offer Acceptances by telephone which will be recorded for subsequent use;

(e) No data will be transferred from NGC to the BMRA until the communication facilities are re-established.

BC2.9.7.3 NGC will advise BM Participants of the withdrawal of the NGC Computing System Failure notification following the re-establishment of the communication facilities.

BC2.10 OTHER OPERATIONAL INSTRUCTIONS AND NOTIFICATIONS

BC2.10.1 NGC may, from time to time, need to issue other instructions or notifications associated with the operation of the NGC GB Transmission System.

BC2.10.2 Such instructions or notifications may include:

- Intertrips
  - an instruction to switch into or out of service an Operational Intertripping scheme;

- Tap Positions
  - a request for a Genset step-up transformer tap position (for security assessment);

- Tests
  - 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
  - a reference to any implications for future BM Unit requirements and the security of the NGC GB Transmission System, including arrangements for change in output to meet post fault security requirements;

- 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 NGC in its reasonable opinion, may be 49.90 or 50.10Hz.

BC2.10.3 Where an instruction or notification under BC2.10.2 (a), (c) or (d) results in a change to the input or output level of the BM Unit then NGC 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 NGC’s agreement for one of the Gensets at that Power Station to be operated under a risk of trip. NGC’s agreement will be dependent on the risk to the NGC GB 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 with:

(i) AVRs in constant terminal voltage mode with 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 NGC.

(b) Where a power system stabiliser is fitted as part of an excitation system of a Genset, it requires on-load commissioning which must be witnessed by NGC. Only when the performance of the power system stabiliser has been approved by NGC shall it be switched into service by a Generator and then it will be kept in service at all times unless otherwise agreed with NGC. 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 NGC’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. NGC’s agreement will be dependent on the risk that would be imposed on the NGC GB 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) NGC 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 NGC 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.

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 NGC will be converted into “from” and “to” MW levels and times before they are submitted to the BMRA by NGC.
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.

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

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 NGC.

(b) Ancillary Service instructions for Frequency Control will normally follow the form:

(i) BM Unit Name
(ii) Instruction Reference Number
(iii) Time of Instruction
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.

BC2.A.2.5 INSTRUCTIONS GIVEN BY TELEPHONE

(a) 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”

(b) 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 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.”
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 NGCGB Transmission System at the Grid Entry Point (or onto the User System at the User System Entry Point in the case of Embedded Power Stations), namely on the higher voltage side of the generator step-up transformer. In relation to each Genset, where there is no HV indication, NGC and the Generator will discuss and agree equivalent Mvar levels for the corresponding LV indication. Where a Genset is instructed to a specific Mvar output, the Generator must achieve that output within a tolerance of ±25 Mvar (for Gensets in England and Wales) or the lesser of +/−5% of rated output or 25 Mvar (for Gensets in Scotland) (or such other figure as may be agreed with NGC) by tap changing on the generator step-up transformer, unless agreed otherwise. Once this has been achieved, the Generator will not tap again without prior consultation with and the agreement of NGC, on the basis that Mvar output will be allowed to vary with System 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 NGCGB Transmission System at the Grid Entry Point (or on the User System at the User System Entry Point in the case of Embedded Power Stations, namely on the higher voltage side of the generator step-up transformer. Where a Genset is instructed to a specific target voltage, the Generator must achieve that target within a tolerance of ±1 kV (or such other figure as may be agreed with NGC) by tap changing on the generator step-up transformer, unless agreed otherwise with NGC. In relation to each Genset, where there is no HV indication, NGC and the Generator 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 Generator will not tap again without prior consultation with, and with the agreement of, NGC. However, under certain circumstances the Generator 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 NGC.</td>
<td>VOLT</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 NGC issued simultaneously to relevant Power Stations. The instruction, which is normally preceded by advance notice, must be</td>
<td>TAPP</td>
</tr>
<tr>
<td>Instruction Name</td>
<td>Description</td>
<td>Type of Instruction</td>
</tr>
<tr>
<td>------------------</td>
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</tr>
<tr>
<td></td>
<td>effected as soon as possible, and in any event within one minute of receipt from NGC 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></td>
</tr>
<tr>
<td>Maximum Mvar Output (&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>Maximum Mvar Absorption (&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 NGC 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 NGC 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, NGC 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 NGC.
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**: The MW output of a *Generating Unit* measured at the generator stator terminals representing the LV equivalent of the *Registered Capacity* at the *Grid Entry Point*.

- **Minimum Output**: The MW output of a *Generating Unit* measured at the generator stator terminals representing the LV equivalent of 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 *NGC* (to the relevant location in accordance with GC6) and must contain all the sections from the relevant part of Annexures 1 and 2 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, *NGC* 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.
APPENDIX 3 - ANNEXURE 1

Company name REVISED Mvar DATA

TO: National Grid NGC Transmission
    NGC Control Centre

Fax telephone No.

Number of pages inc. header:.........................

Sent By: ........................................................................................................

Return Acknowledgement Fax to .............................................................

For Retransmission or Clarification ring....................................................

Acknowledged by NGC: (Signature)
..................................................................................................................

Acknowledgement time and date .................................................................

Legibility of FAX:                  Acceptable

Unacceptable
(List pages if appropriate) (Resend FAX)
APPENDIX 3 - ANNEXURE 2

To: NGC National Grid Transmission Control Centre

From: [Company Name & Location]

**REVISED Mvar DATA**

<table>
<thead>
<tr>
<th>GENERATING UNIT*</th>
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**NOTIFICATION TIME:**

<table>
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<tr>
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Start Time/Date (if not effective immediately)

**REACTIVE POWER CAPABILITY AT GENERATOR STATOR TERMINAL** (at rated terminal volts)

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<thead>
<tr>
<th>MW</th>
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<tr>
<td>AT FULL OUTPUT (MW)</td>
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<td></td>
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<tr>
<td>AT MINIMUM OUTPUT (MW)</td>
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**GENERATING UNIT STEP-UP TRANSFORMER DATA**

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<tr>
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<th>TAP NUMBER RANGE</th>
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**OPTIONAL INFORMATION** (for Ancillary Services use only) -

**REACTIVE POWER CAPABILITY AT COMMERCIAL BOUNDARY** (at rated stator terminal and nominal system volts)

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<thead>
<tr>
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<th>LAG (Mvar)</th>
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</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) ____________________________________________

* For a CCGT, the redeclaration is for an individual CCGT unit and not the entire module.

< End of BC2 >
# BALANCING CODE NO.3

FREQUENCY CONTROL PROCESS

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BC3.1 INTRODUCTION

BC3 sets out the procedure for NGC to use in relation to Users to undertake System Frequency control. System Frequency will be controlled by response from Gensets operating in Limited Frequency Sensitive Mode or Frequency Sensitive Mode, by the issuing of instructions to Gensets 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 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 NGC 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 NGC if so agreed.

BC3.2 OBJECTIVE

The procedure for NGC to direct System Frequency control is intended to enable (as far as possible) NGC to meet the statutory requirements of System Frequency control.

BC3.3 SCOPE

BC3 applies to NGC and to Users, which in this BC3 means:-

(a) Generators with regard to their Large Power Stations,

(b) Network Operators,

(c) other providers of Ancillary Services, and

(d) Externally Interconnected System Operators.
MANAGING SYSTEM FREQUENCY

BC3.4.1 Statutory Requirements
When NGC 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 operating in Frequency Sensitive Mode will be instructed by NGC to operate taking due account of the Target Frequency notified by NGC.

BC3.4.2 Target Frequency
NGC will give 15 minutes notice of variation in Target Frequency.

BC3.4.3 Electric Time
NGC 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 NGC 's reasonable discretion.

RESPONSE FROM GENSETS

BC3.5.1 Capability
Each Genset 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. In addition each Genset 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 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 Existing Gas Cooled Reactor Plant
NGC will permit Existing Gas Cooled Reactor Plant other than Frequency Sensitive AGR Units to operate in Limited Frequency Sensitive Mode at all times.

BC3.5.4 Frequency Sensitive Mode
(a) NGC may issue an instruction to a Genset 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 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** 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**.

(d) Such instruction will continue until countermanded by NGC or until the **Genset** is **De-Synchronised**, whichever is the first to occur.

(e) NGC will not so instruct **Generators** in respect of **Existing Gas Cooled Reactor Plant** other than **Frequency Sensitive AGR Units**.

**BC3.5.5 System Frequency Induced Change**

A **System Frequency** induced change in the **Active Power** output of a **Genset** which assists recovery to **Target Frequency** must not be countermanded by a **Generator** 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**.

**BC3.6 RESPONSE TO LOW FREQUENCY**

**BC3.6.1 Low Frequency Relay Initiated Response from Gensets**

(a) **NGC** may utilise **Gensets** with the capability of **Low Frequency Relay** initiated response as:

(i) synchronisation and generation from standstill;

(ii) generation from zero generated output;

(iii) increase in generated output

in establishing its requirements for **Operating Reserve**.

(b) (i) **NGC** will specify within the range agreed with **Generators**, **Low Frequency Relay** settings to be applied to the **Gensets** pursuant to BC3.6.1 (a) and instruct the **Low Frequency Relay** initiated response placed in and out of service.

(ii) **Generators** will comply with **NGC** instructions for **Low Frequency Relay** settings and **Low Frequency Relay** initiated response to be placed in or out of service. **Generators** may not alter such **Low Frequency Relay** settings or take **Low Frequency Relay** initiated response out of service without **NGC'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

(a) **NGC** 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) **NGC** 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 **NGC** 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 **NGC** 's agreement, except for safety reasons.

(iii) In the case of any such **Demand** which is **Embedded**, **NGC** 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) **NGC** 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**

BC3.7.1 Plant in **Frequency Sensitive Mode** instructed to provide **High Frequency Response**

(a) Each **Synchronised Genset** in respect of which the **Generator** has been instructed to operate so as to provide **High Frequency Response**, which is producing **Active Power** and which is operating above **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**. If more than one rate is provided for in the **Ancillary Services Agreement** **NGC** 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** must continue to reduce **Active Power** output in response to an increase in **System Frequency** to 50.5 Hz or above 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 the avoidance of doubt, the provision of this reduction in **Active Power** output is not an **Ancillary Service**.

**BC3.7.2 Plant in Limited Frequency Sensitive Mode**

(a) Each **Synchronised Genset** 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. 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 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** output control devices other than the 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** 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** 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 NGC.

**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** then NGC should not, upon request, unreasonably withhold...
issuing a **Bid-Offer Acceptance** to return the **Generating Unit** or **CCGT Module** to an output not less than **Minimum Generation**.

(b) It is possible that **Synchronised Gensets** which have 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** 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** 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** is required to take action to protect the **Generating Units** as specified in CC.6.3.13.

(e) In the event of the **System Frequency** becoming stable above 50.5Hz, after all **Genset** action as specified in BC3.7.1 and BC3.7.2 has taken place, **NGC** will issue appropriate **Bid-Offer Acceptances** and/or **Ancillary Service** instructions, which may include **Emergency Instructions** under **BC2** to trip **Gensets** 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** action as specified in BC3.7.1 and BC3.7.2 has taken place, **NGC** will issue **Emergency Instructions** under **BC2** to trip appropriate **Gensets** 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** 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 **NGC**
In order that **NGC** can deal with the emergency conditions effectively, it needs as much up to date information as possible and accordingly **NGC** 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**.

BC3.7.6 **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).

BC3.7.7 **Externally Interconnected System Operators**
**NGC** 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 **NGCGB Transmission System** from its **External System**, the amount of power transferred in to the **NGCGB 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**.

< End of BC3 >
# 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 NGC from Users and by Users from NGC, 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 NGC. 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 NGC under the Grid Code.

DRC.2.2 List all the data to be provided by NGC to each category of User under the Grid Code.

DRC.3 SCOPE

DRC.3.1 The DRC applies to NGC and to Users, which in this DRC means:-

(a) Generators;

(b) Network Operators;

(c) Suppliers;

(d) Non-Embedded Customers (including, for the avoidance of doubt, a Pumped Storage Generator in that capacity);

(e) Externally Interconnected System Operators;

(f) Interconnector Users; and
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 NGC 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 NGC 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 NGC.
DRC.5.2.2 Data must be submitted to the National Grid Transmission Control Centre notified by NGC or to such other department or address as NGC 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 NGC, data may be submitted via this link. NGC will, in this situation, provide computer files for completion by the User containing all the data in the corresponding DRC schedule.

Data submitted under Schedule 5, with the exception of the single line diagram, shall be submitted on floppy disk using a proforma to be supplied by NGC, or by any other means or format as may be agreed between the User and NGC. This proforma is to be supplied by NGC no later than calendar week 19 in each year.

DRC.5.2.4 Other modes of data transfer, such as magnetic tape, may be utilised if NGC 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 NGC the User must notify NGC in accordance with each section of the Grid Code. The method and timing of the notification to NGC is set out in each section of the Grid Code.

DRC.5.4 Data not Supplied

DRC.5.4.1 Users and NGC 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, NGC will estimate such data if and when, in the NGC's view, it is necessary to do so. If NGC 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 NGC or that User, as the case may be, deems appropriate.

DRC.5.4.2 NGC 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 NGC 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.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) TECHNICAL DATA.

Comprising Generating Unit (and CCGT Module) 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 NGCGB Transmission System.

DRC.6.1.6  SCHEDULE 6 - USERS OUTAGE INFORMATION.
Comprising the information required by NGC 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 NGC 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 NGCGB 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 NGCGB Transmission System from Users other than Generators.

DRC.6.1.14  SCHEDULE 14 - FAULT INFEED DATA
Comprising information relating to the Short Circuit contribution to the NGCGB Transmission System from Generators.

DRC.6.1.15  SCHEDULE 15 – MOTHBALED GENERATING UNIT AND ALTERNATIVE FUEL DATA
Comprising information relating to estimated return to service times for Mothballed Generating Units and the capability of gas-fired Generating Units to operate using alternative fuels.

DRC.6.2 The Schedules applicable to each class of User are as follows:

**Generators with Large Power Stations**
- Sched 1, 2, 3, 4, 9, 14, 15

**Generators with Medium Power Stations** (See note 2)
- Sched 1, 9, 14, 15

**Generators with Small Power Stations**
- Sched 1, 6, 14, 15

**Generators directly connected to the NGCGB Transmission System**

**All Users connected directly to NGCGB Transmission System**
- Sched 5, 6, 9

**All Users connected directly to the NGCGB Transmission System other than Generators**
- Sched 10,11,13

**All Users connected directly to NGCGB Transmission System with Demand**
- Sched 7, 9

**A Pumped Storage Generator, Externally Interconnected System Operator and Interconnector Users**
- Sched 12

**All Suppliers**
- Sched 12

**All Network Operators**
- Sched 12

**All BM Participants**
- Sched 8

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 NGC 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 NGC.
**DATA REGISTRATION CODE**

**GENERATING UNIT (OR CCGT MODULE) TECHNICAL DATA**

**POWER STATION NAME:** ____________________________  **DATE:** ____________

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>GENERATING UNIT OR STATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Fyr 0</td>
</tr>
</tbody>
</table>

**GENERATING STATION DEMANDS:**

**Demand** associated with the Power Station supplied through the NGCCG Transmission System or the Generator's User System

- The maximum **Demand** that could occur:
  - **Demand** at specified time of annual peak half hour of NGCCG Transmission System Demand at Annual ACS Conditions.
  - **Demand** at specified time of annual minimum half-hour of NGCCG Transmission System Demand.

(Additional Demand supplied through the unit transformers to be provided below)

**INDIVIDUAL GENERATING UNIT (OR AS THE CASE MAY BE, CCGT MODULE) DATA**

Point of connection to the NGCCG Transmission System (or the Total System if embedded) of the Generating Unit (other than a CCG Unit) or the CCGT Module, as the case may be in terms of geographical and electrical location and system voltage

| Type of Unit (steam, Gas Turbine Combined Cycle Gas Turbine Unit, tidal, wind, etc.) | SPD |

If the busbars at the Connection Point are normally run in separate sections identify the section to which the Generating Unit (other than a CCG Unit) or CCGT Module, as the case may be is connected

| Section Number | SPD |

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.
ABBREVIATIONS:

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</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>
</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.
<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA CAT.</th>
<th>GENERATING UNIT (OR CCGT MODULE, AS THE CASE MAY BE)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rated MVA</strong></td>
<td>MVA</td>
<td>SPD+</td>
<td>G1 G2 G3 G4 G5 G6 STN</td>
</tr>
<tr>
<td><strong>Rated MW</strong></td>
<td>MW</td>
<td>SPD+</td>
<td></td>
</tr>
<tr>
<td><strong>Rated terminal voltage</strong></td>
<td>kV</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td><em>Performance Chart at Generating Unit stator terminals</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Output Usable (on a monthly basis)</em></td>
<td>MW</td>
<td>SPD</td>
<td></td>
</tr>
<tr>
<td><strong>Turbo-Generator inertia constant (for synchronous machines)</strong></td>
<td>MW secs /MVA</td>
<td>SPD+</td>
<td></td>
</tr>
<tr>
<td><strong>Short circuit ratio (synchronous machines)</strong></td>
<td></td>
<td>SPD+</td>
<td></td>
</tr>
<tr>
<td><strong>Normal auxiliary load supplied by the Generating Unit at rated MW output</strong></td>
<td>MW</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td><strong>Rated field current at rated MW and Mvar output and at rated terminal voltage</strong></td>
<td>A</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td><strong>Field current open circuit saturation curve (as derived from appropriate manufacturers’ test certificates):</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120% rated terminal volts</td>
<td>A</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>110% rated terminal volts</td>
<td>A</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>100% rated terminal volts</td>
<td>A</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>90% rated terminal volts</td>
<td>A</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>80% rated terminal volts</td>
<td>A</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>70% rated terminal volts</td>
<td>A</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>60% rated terminal volts</td>
<td>A</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>50% rated terminal volts</td>
<td>A</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td><strong>IMPEDANCES:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Unsaturated)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Direct axis synchronous reactance</strong></td>
<td>% on MVA</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td><strong>Direct axis transient reactance</strong></td>
<td>% on MVA</td>
<td>SPD+</td>
<td></td>
</tr>
<tr>
<td><strong>Direct axis sub-transient reactance</strong></td>
<td>% on MVA</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td><strong>Quad axis synch reactance</strong></td>
<td>% on MVA</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td><strong>Quad axis sub-transient reactance</strong></td>
<td>% on MVA</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td><strong>Stator leakage reactance</strong></td>
<td>% on MVA</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td><strong>Armature winding direct current resistance.</strong></td>
<td>% on MVA</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td><strong>In Scotland, negative sequence resistance</strong></td>
<td>% on MVA</td>
<td>DPD</td>
<td></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.
**DATA DESCRIPTION**

<table>
<thead>
<tr>
<th>DATA CAT.</th>
<th>UNITS</th>
<th>GENERATING UNIT OR STATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>G1</td>
</tr>
</tbody>
</table>

**TIME CONSTANTS**
(Short-circuit and Unsaturated)

<table>
<thead>
<tr>
<th>DATA CAT.</th>
<th>UNITS</th>
<th>GENERATING UNIT OR STATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>G1</td>
</tr>
</tbody>
</table>

Direct axis transient time constant
Direct axis sub-transient time constant
Quadrature axis sub-transient time constant
Stator time constant

**GENERATING UNIT STEP-UP TRANSFORMER**

<table>
<thead>
<tr>
<th>DATA CAT.</th>
<th>UNITS</th>
<th>GENERATING UNIT OR STATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>G1</td>
</tr>
</tbody>
</table>

Rated MVA
Voltage Ratio
Positive sequence reactance:
Max tap
Min tap
Nominal tap
Positive sequence resistance:
Max tap
Min tap
Nominal tap
Zero phase sequence reactance
Tap change range
Tap change step size
Tap changer type, on-load or off-circuit

**EXCITATION:**

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.

Option 1

<table>
<thead>
<tr>
<th>DATA CAT.</th>
<th>UNITS</th>
<th>GENERATING UNIT OR STATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>G1</td>
</tr>
</tbody>
</table>

DC gain of Excitation Loop
Max field voltage
Min field voltage
Rated field voltage
Max rate of change of field volts:
Rising
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

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 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.
### Option 2

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
<th>Data Cat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exciter category, e.g. Rotating Exciter, or Static Exciter etc</td>
<td>Text</td>
<td>SPD</td>
</tr>
<tr>
<td>Excitation System Nominal Response</td>
<td>$V_E$</td>
<td>sec$^{-1}$</td>
</tr>
<tr>
<td>Rated Field Voltage</td>
<td>$U_{IN}$</td>
<td>V</td>
</tr>
<tr>
<td>No-load Field Voltage</td>
<td>$U_{IO}$</td>
<td>V</td>
</tr>
<tr>
<td>Excitation System On-Load Positive Ceiling Voltage</td>
<td>$U_{PL+}$</td>
<td>V</td>
</tr>
<tr>
<td>Excitation System No-Load Positive Ceiling Voltage</td>
<td>$U_{PO+}$</td>
<td>V</td>
</tr>
<tr>
<td>Excitation System No-Load Negative Ceiling Voltage</td>
<td>$U_{PO-}$</td>
<td>V</td>
</tr>
<tr>
<td>Power System Stabiliser (PSS) fitted</td>
<td>Yes/No</td>
<td>SPD</td>
</tr>
</tbody>
</table>

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.
### Option 1

**GOVERNOR PARAMETERS (REHEAT UNITS)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Units</th>
<th>Data Cat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>HP Governor average gain</td>
<td>MW/Hz</td>
<td>DPD</td>
</tr>
<tr>
<td>Speeder motor setting range</td>
<td>Hz</td>
<td>DPD</td>
</tr>
<tr>
<td>HP governor valve time constant</td>
<td>S</td>
<td>DPD</td>
</tr>
<tr>
<td>HP governor valve opening limits</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>HP governor valve rate limits</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>Re-heat time constant (stored Active Energy in reheater)</td>
<td>S</td>
<td>DPD</td>
</tr>
<tr>
<td>IP Governor average gain</td>
<td>MW/Hz</td>
<td>DPD</td>
</tr>
<tr>
<td>IP governor setting range</td>
<td>Hz</td>
<td>DPD</td>
</tr>
<tr>
<td>IP governor time constant</td>
<td>S</td>
<td>DPD</td>
</tr>
<tr>
<td>IP governor valve opening limits</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>IP governor valve rate limits</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>Details of acceleration sensitive elements HP &amp; IP in governor loop</td>
<td>DPD (please attach)</td>
<td></td>
</tr>
<tr>
<td>Governor block diagram showing transfer functions of individual elements</td>
<td>DPD (please attach)</td>
<td></td>
</tr>
</tbody>
</table>

**GOVERNOR (Non-reheat steam and Gas Turbines)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Units</th>
<th>Data Cat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Governor average gain</td>
<td>MW/Hz</td>
<td>DPD</td>
</tr>
<tr>
<td>Speeder motor setting range</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>Time constant of steam or fuel governor valve</td>
<td>S</td>
<td>DPD</td>
</tr>
<tr>
<td>Governor valve opening limits</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>Governor valve rate limits</td>
<td></td>
<td>DPD</td>
</tr>
<tr>
<td>Time constant of turbine</td>
<td>S</td>
<td>DPD</td>
</tr>
<tr>
<td>Governor block diagram</td>
<td></td>
<td>(please attach)</td>
</tr>
</tbody>
</table>

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.
**DATA DESCRIPTION**

<table>
<thead>
<tr>
<th>UNITS</th>
<th>GENERATING UNIT OR STATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>G1</td>
</tr>
</tbody>
</table>

### BOILER & STEAM TURBINE DATA*

- **Boiler time constant ( Stored Active Energy)**
  - S
  - DPD

- **HP turbine response ratio**: (Proportion of Primary Response arising from HP turbine)
  - %
  - DPD

- **HP turbine response ratio**: (Proportion of High Frequency Response arising from HP turbine)
  - %
  - DPD

### Option 2

**All Generating Units**

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

- **Governor Time Constant**
  - Sec
  - DPD

- **Governor Deadband**
  - Maximum Setting ±Hz
  - Normal Setting ±Hz
  - Minimum Setting ±Hz

- **Speeder Motor Setting Range**
  - %
  - DPD

- **Average Gain**
  - MW/Hz
  - DPD

### Steam Units

- **HP Valve Time Constant**
  - sec
  - DPD

- **HP Valve Opening Limits**
  - %
  - DPD

- **HP Valve Opening Rate Limits**
  - %/sec
  - DPD

- **HP Valve Closing Rate Limits**
  - %/sec
  - DPD

- **HP Turbine Time Constant**
  - sec
  - DPD

- **IP Valve Time Constant**
  - sec
  - DPD

- **IP Valve Opening Limits**
  - %
  - DPD

- **IP Valve Opening Rate Limits**
  - %/sec
  - DPD

- **IP Valve Closing Rate Limits**
  - %/sec
  - DPD

- **IP Turbine Time Constant**
  - sec
  - DPD

- **LP Valve Time Constant**
  - sec
  - DPD

- **LP Valve Opening Limits**
  - %
  - DPD

- **LP Valve Opening Rate Limits**
  - %/sec
  - DPD

- **LP Valve Closing Rate Limits**
  - %/sec
  - DPD

- **LP Turbine Time Constant**
  - sec
  - DPD

- **Reheater Time Constant**
  - sec
  - DPD

- **Boiler Time Constant**
  - sec
  - DPD

- **HP Power Fraction**
  - %
  - DPD

- **IP Power Fraction**
  - %
  - DPD

---

*Where the generating unit governor does not have a selectable deadband facility, then the actual value of the deadband need only be provided.*
<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA CAT.</th>
<th>GENERATING UNIT OR STATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>G1</td>
</tr>
<tr>
<td><strong>Gas Turbine Units</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inlet Guide Vane Time Constant</td>
<td>sec</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Inlet Guide Vane Opening Limits</td>
<td>%</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Inlet Guide Vane Opening Rate Limits</td>
<td>%/sec</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Inlet Guide Vane Closing Rate Limits</td>
<td>%/sec</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Fuel Valve Time Constant</td>
<td>sec</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Fuel Valve Opening Limits</td>
<td>%</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Fuel Valve Opening Rate Limits</td>
<td>%/sec</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Fuel Valve Closing Rate Limits</td>
<td>%/sec</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Waste Heat Recovery Boiler Time Constant</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Hydro Generating Units</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Guide Vane Actuator Time Constant</td>
<td>sec</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Guide Vane Opening Limits</td>
<td>%</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Guide Vane Opening Rate Limits</td>
<td>%/sec</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Guide Vane Closing Rate Limits</td>
<td>%/sec</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>Water Time Constant</td>
<td>sec</td>
<td>DPD</td>
<td></td>
</tr>
</tbody>
</table>

**UNIT CONTROL OPTIONS**

| 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 |

**NOTE:**

Users are referred to Schedules 5 & 14 which set down data required for all Users directly connected to the NGC GB Transmission System, including Power Stations.
This schedule contains the Genset Generation Planning Parameters required by NGC to facilitate studies in Operational Planning timescales.

For a Generating Unit at a Large Power Station the information is to be submitted on a unit basis and for a CCGT Module at a Large Power Station the information is to be submitted on a module basis, unless otherwise stated.

Where references to CCGT Modules at a Large Power Station are made, the columns “G1” etc should be amended to read “M1” etc, as appropriate.

### Generation: _________________________

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA CAT.</th>
<th>GENSET OR STATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OUTPUT CAPABILITY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registered Capacity on a station and unit basis (on a station and module basis in the case of a CCGT Module at a Large Power Station)</td>
<td>MW</td>
<td>SPD</td>
<td>G1</td>
</tr>
<tr>
<td>Minimum Generation (on a module basis in the case of a CCGT Module at a Large Power Station)</td>
<td>MW</td>
<td>SPD</td>
<td>G1</td>
</tr>
<tr>
<td>MW available from Generating Units in excess of Registered Capacity</td>
<td>MW</td>
<td>SPD</td>
<td>G1</td>
</tr>
<tr>
<td><strong>REGIME UNAVAILABILITY</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Expected Running Regime. Is Power Station normally available for full output 24 hours per day, 7 days per week? If No please provide details of unavailability below.</td>
<td></td>
<td>SPD</td>
<td>G1</td>
</tr>
<tr>
<td>Earliest Synchronising time:</td>
<td>hr/min</td>
<td>OC2</td>
<td>G1</td>
</tr>
<tr>
<td>Monday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuesday – Friday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturday – Sunday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Latest De-Synchronising time:</td>
<td>hr/min</td>
<td>OC2</td>
<td>G1</td>
</tr>
<tr>
<td>Monday – Thursday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturday – Sunday</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SYNCHRONISING PARAMETERS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notice to Deviate from Zero (NDZ) after 48 hour Shutdown</td>
<td>Mins</td>
<td>OC2</td>
<td>G1</td>
</tr>
<tr>
<td>Station Synchronising Intervals (SI) after 48 hour Shutdown</td>
<td>Mins</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Synchronising Group (if applicable)</td>
<td>1 to 4</td>
<td>OC2</td>
<td>G1</td>
</tr>
<tr>
<td>DATA DESCRIPTION</td>
<td>UNITS</td>
<td>DATA CAT.</td>
<td>GENSET OR STATION DATA</td>
</tr>
<tr>
<td>------------------------------------------------------</td>
<td>-------</td>
<td>-----------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Synchronising Generation (SYG) after 48 hour Shutdown</td>
<td>MW</td>
<td>DPD</td>
<td>G1 G2 G3 G4 G5 G6 STN</td>
</tr>
<tr>
<td>De-Synchronising Intervals (Single value)</td>
<td>Mins</td>
<td>OC2</td>
<td>- - - - - -</td>
</tr>
<tr>
<td>RUNNING AND SHUTDOWN PERIOD LIMITATIONS:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimum Non Zero time (MNZT) after 48 hour Shutdown</td>
<td>Mins</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Minimum Zero time (MZT)</td>
<td>Mins</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Two Shifting Limit (max. per day)</td>
<td>No.</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Existing AGR Plant Flexibility Limit (Existing AGR Plant only)</td>
<td>No.</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>80% Reactor Thermal Power (expressed as Gross-Net MW) (Existing AGR Plant only)</td>
<td>MW</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Frequency Sensitive AGR Unit Limit (Frequency Sensitive AGR Units only)</td>
<td>No.</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>RUN-UP PARAMETERS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Run-up rates (RUR) after 48 hour Shutdown:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(See note 2 page 3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MW Level 1 (MWL1)</td>
<td>MW</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>MW Level 2 (MWL2)</td>
<td>MW</td>
<td>OC2</td>
<td>-</td>
</tr>
<tr>
<td>RUR from Synch. Gen to MWL1</td>
<td>MW/Mins</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>RUR from MWL1 to MWL2</td>
<td>MW/Mins</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>RUR from MWL2 to RC</td>
<td>MW/Mins</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Run-Down Rates (RDR):</td>
<td></td>
<td></td>
<td></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>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MWL2</td>
<td>MW</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>RDR from RC to MWL2</td>
<td>MW/Min</td>
<td>DPD &amp; OC2</td>
<td></td>
</tr>
<tr>
<td>MWL1</td>
<td>MW</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>RDR from MWL2 to MWL1</td>
<td>MW/Min</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>RDR from MWL1 to de-synch</td>
<td>MW/Min</td>
<td>OC2</td>
<td></td>
</tr>
</tbody>
</table>
### DATA DESCRIPTION

<table>
<thead>
<tr>
<th>GENSET OR STATION DATA</th>
<th>GENSET OR STATION DATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>G2</td>
</tr>
<tr>
<td>G3</td>
<td>G4</td>
</tr>
<tr>
<td>G5</td>
<td>G6</td>
</tr>
<tr>
<td>STN</td>
<td></td>
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</tbody>
</table>

#### REGULATION PARAMETERS

<table>
<thead>
<tr>
<th>Regulating Range Load rejection capability while still Synchronised and able to supply Load.</th>
<th>MW</th>
<th>DPD</th>
</tr>
</thead>
</table>

#### GAS TURBINE LOADING PARAMETERS:

<table>
<thead>
<tr>
<th>Fast loading</th>
<th>Slow loading</th>
<th>OC2</th>
</tr>
</thead>
<tbody>
<tr>
<td>MW/Min</td>
<td>MW/Min</td>
<td>OC2</td>
</tr>
</tbody>
</table>

#### CCGT MODULE PLANNING MATRIX

<table>
<thead>
<tr>
<th>OC2</th>
</tr>
</thead>
</table>

(please attach)

### NOTES:

1. To allow for different groups of **Gensets** within a **Power Station** (e.g., **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 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>
</tr>
</thead>
<tbody>
<tr>
<td>Power Station name: ………………………</td>
<td></td>
<td></td>
<td></td>
<td>OC2</td>
</tr>
<tr>
<td>Generating Unit (or CCGT Module at a Large Power Station) number: ………</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Registered Capacity: ……………………</td>
<td></td>
<td></td>
<td></td>
<td>OC2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Large Power Station OUTAGE PROGRAMME</th>
<th>Large Power Station OUTPUT USABLE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### PLANNING FOR YEARS 3 - 7 AHEAD

Provisional outage programme comprising:
- Duration: weeks
- Preferred start date
- Earliest start date
- Latest finish date

Weekly OU MW

(NGC response as detailed in OC2)

(Users’ response to NGC suggested changes or potential outages)

Updated provisional outage programme comprising:
- Duration: weeks
- Preferred start date
- Earliest start date
- Latest finish date

Updated weekly OU MW

(NGC response as detailed in OC2 for)

(Users’ response to NGC suggested changes or update of potential outages)

(NGC further suggested revisions etc. (as detailed in OC2 for)

Agreement of final Generation Outage Programme

### PLANNING FOR YEARS 1 - 2 AHEAD

Update of previously agreed Final Generation Outage Programme

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>
</tr>
</thead>
<tbody>
<tr>
<td>(NGC response as detailed in OC2 for C. yrs 1 - 2 Week 12)</td>
<td>C. yrs 1 - 2</td>
<td>Week 12</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>(Users’ response to NGC suggested changes or update of potential outages)</td>
<td>C. yrs 1 - 2</td>
<td>Week 14</td>
<td></td>
<td></td>
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<tr>
<td>Revised weekly OU</td>
<td>C. yrs 1 - 2</td>
<td>Week 34</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>(NGC response as detailed in OC2 for C. yrs 1 - 2 Week 39)</td>
<td>C. yrs 1 - 2</td>
<td>Week 39</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>(Users’ response to NGC suggested changes or update of potential outages)</td>
<td>C. yrs 1 - 2</td>
<td>Week 46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agreement of final Generation Outage Programme</td>
<td>C. yrs 1 - 2</td>
<td>Week 48</td>
<td>OC2</td>
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### PLANNING FOR YEAR 0

<table>
<thead>
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<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>TIME COVERED</th>
<th>UPDATE TIME</th>
<th>DATA CAT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Updated Final Generation Outage Programme</td>
<td>C. yr 0 Week 2 ahead to year end 1600 Weds.</td>
<td>OC2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OU at weekly peak MW</td>
<td>“”</td>
<td>“”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(NGC response as detailed in OC2 for C. yrs 0 Weeks 8 to 52 ahead 1700 Friday)</td>
<td>C. yrs 0</td>
<td>Week 17</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>(Users’ response to NGC suggested changes or update of potential outages)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(NGC response as detailed in OC2 for Weeks 2 - 7 ahead 1600 Thurs)</td>
<td>Weeks 2 - 7</td>
<td>Week 24</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Forecast return to services (Planned Outage or breakdown)</td>
<td>days 2 to 14 ahead 0900 daily</td>
<td>OC2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OU (all hours) MW</td>
<td>“”</td>
<td>“”</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>(NGC response as detailed in OC2 for days 2 to 14 ahead 1600 daily)</td>
<td>days 2 to 14</td>
<td>Week 32</td>
<td>OC2</td>
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</tr>
</tbody>
</table>

### INFLEXIBILITY

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>TIME COVERED</th>
<th>UPDATE TIME</th>
<th>DATA CAT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genset inflexibility Min MW (Weekly) Weeks 2 - 8 ahead 1600 Tues</td>
<td>OC2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(NGC response on Negative Reserve Active (Power Margin) Power Margin)</td>
<td>“”</td>
<td>1200 Friday</td>
<td>OC2</td>
<td></td>
</tr>
<tr>
<td>Genset inflexibility Min MW (daily) days 2 - 14 ahead 0900 daily</td>
<td>OC2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(NGC response on Negative Reserve Active (Power Margin) Power Margin)</td>
<td>“”</td>
<td>1600 daily</td>
<td>OC2</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 (e.g., wind power) or to some other pattern (e.g., Tidal) sufficient information is required to enable an understanding of the possible profile.

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>TIME COVERED</th>
<th>UPDATE TIME</th>
<th>DATA CAT.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Large Power Stations</strong></td>
<td>MW</td>
<td>F. yrs 1 - 7</td>
<td>Week 24</td>
<td>SPD</td>
</tr>
</tbody>
</table>

**Notes:** 1. The week numbers quoted in the Update Time column refer to standard weeks in the current year.
GOVERNOR DROOP AND RESPONSE

The Data in this Schedule 4 is to be supplied by Generators with respect to all Large Power Stations, 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, on a modular basis assuming all units are Synchronised)</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>MLP2</td>
<td>Minimum Generation (for a CCGT 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. The Response Capability should be provided for each Genset.
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 NGC GR 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 CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USERS SYSTEM LAYOUT</strong></td>
<td>SPD</td>
<td></td>
</tr>
</tbody>
</table>

A Single Line Diagram showing all or part of the User’s System is required. This diagram shall include:-

(a) all parts of the User’s System, whether existing or proposed, operating at Supergrid Voltage, and in Scotland, also all parts of the User System operating at 132kV.

(b) all parts of the User’s System operating at a voltage of 50kV, and in Scotland greater than 30kV, or higher which can interconnect Connection Points, or split bus-bars at a single Connection Point.

(c) all parts of the User’s System between Embedded Medium Power Stations or Large Power Stations connected to the User’s Subtransmission System and the relevant Connection Point.

(d) all parts of the User’s System at a NGC site Transmission Site.

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 NGC’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 also at 132kV, circuit breakers and phasing arrangements shall be shown.
### USERS SYSTEM DATA

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REACTIVE COMPENSATION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For independently switched reactive compensation equipment not owned by <strong>NGCa Transmission Licensee</strong> connected to the <strong>User's System</strong> at 132kV and above, and also in Scotland, connected at 33kV and above, other than power factor correction equipment associated with a customers <strong>Plant</strong> or <strong>Apparatus</strong>:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type of equipment (eg. fixed or variable)</td>
<td>Text</td>
<td>SPD</td>
</tr>
<tr>
<td>Capacitive rating; or</td>
<td>Mvar</td>
<td>SPD</td>
</tr>
<tr>
<td>Inductive rating; or</td>
<td>Mvar</td>
<td>SPD</td>
</tr>
<tr>
<td>Operating range</td>
<td>Mvar</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>SPD</td>
</tr>
<tr>
<td>Point of connection to <strong>User's System</strong> (electrical location and system voltage)</td>
<td>Text</td>
<td>SPD</td>
</tr>
<tr>
<td><strong>SUBSTATION INFRASTRUCTURE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For the infrastructure associated with any <strong>User's</strong> equipment at a Substation owned, <strong>by a Transmission Licensee</strong> or operated or managed by <strong>NGC</strong>:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rated 3-phase rms short-circuit withstand current</td>
<td>kA</td>
<td>SPD</td>
</tr>
<tr>
<td>Rated 1-phase rms short-circuit withstand current</td>
<td>kA</td>
<td>SPD</td>
</tr>
<tr>
<td>Rated Duration of short-circuit withstand</td>
<td>s</td>
<td>SPD</td>
</tr>
<tr>
<td>Rated rms continuous current</td>
<td>A</td>
<td>SPD</td>
</tr>
</tbody>
</table>
### USER'S SYSTEM DATA

**Circuit Parameters**

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>Operatiing 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>R X B</td>
<td>R X B</td>
<td>R X B</td>
<td>R X 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

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>HV</td>
<td>LV</td>
<td>Max Tap</td>
<td>Min. Tap</td>
<td>Nom. Tap</td>
<td>Direct/ Res/ Rea</td>
<td>On/ Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Max Tap</td>
<td>Min. Tap</td>
<td>Nom. Tap</td>
<td>Direct/ Res/ Rea</td>
<td>On/ Off</td>
<td>Direct/ Res/ Rea</td>
<td>On/ Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Max Tap</td>
<td>Min. Tap</td>
<td>Nom. Tap</td>
<td>Direct/ Res/ Rea</td>
<td>On/ Off</td>
<td>Direct/ Res/ Rea</td>
<td>On/ Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Max Tap</td>
<td>Min. Tap</td>
<td>Nom. Tap</td>
<td>Direct/ Res/ Rea</td>
<td>On/ Off</td>
<td>Direct/ Res/ Rea</td>
<td>On/ Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Max Tap</td>
<td>Min. Tap</td>
<td>Nom. Tap</td>
<td>Direct/ Res/ Rea</td>
<td>On/ Off</td>
<td>Direct/ Res/ Rea</td>
<td>On/ Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Max Tap</td>
<td>Min. Tap</td>
<td>Nom. Tap</td>
<td>Direct/ Res/ Rea</td>
<td>On/ Off</td>
<td>Direct/ Res/ Rea</td>
<td>On/ Off</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Max Tap</td>
<td>Min. Tap</td>
<td>Nom. Tap</td>
<td>Direct/ Res/ Rea</td>
<td>On/ Off</td>
<td>Direct/ Res/ Rea</td>
<td>On/ Off</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.
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.

*If Resistance or Reactance please give impedance value.*
USER'S SYSTEM DATA
Switchgear Data

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, 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 **NGC**.

<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

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PROTECTION SYSTEMS</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The following information relates only to Protection equipment which can trip or</td>
<td></td>
<td></td>
</tr>
<tr>
<td>inter-trip or close any Connection Point circuit breaker or any NGCGB Transmission</td>
<td></td>
<td></td>
</tr>
<tr>
<td>System circuit breaker. The information need only be supplied once, in accordance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>with the timing requirements set out in PC.A.1.4 (b) and need not be supplied on</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a routine annual thereafter, although NGC should be notified if any of the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>information changes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) A full description, including estimated settings, for all relays and Protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>systems installed or to be installed on the User’s System;</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(b) A full description of any auto-reclose facilities installed or to be installed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>on the User’s System, including type and time delays;</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>(c) A full description, including estimated settings, for all relays and Protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>systems installed or to be installed on the Generating Unit’s generator</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>transformer, unit transformer, station transformer and their associated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>connections;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(d) For Generating Units having a circuit breaker at the generator terminal</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>voltage clearance times for electrical faults within the Generating Unit zone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>must be declared.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(e) Fault Clearance Times:</td>
<td>mSec</td>
<td>DPD</td>
</tr>
<tr>
<td>Most probable fault clearance time for electrical faults on any part of the</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Users System directly connected to the NGCGB Transmission System.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
USER’S SYSTEM DATA

Information for Transient Overvoltage Assessment (DPD)

The information listed below may be requested by NGC from each User with respect to any Connection Site between that User and NGC the GB 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 NGC GB Transmission System without intermediate transformation;

(f) The following data is required on all transformers operating at Supergrid Voltage and also in Scotland, 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)

The information given below, both current and forecast, where not already supplied in this Schedule 5 may be requested by NGC from each User if it is necessary for NGC to evaluate the production/magnification of harmonic distortion on NGC GB 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)

The information listed below, where not already supplied in this Schedule 5, may be requested by NGC from each User with respect to any Connection Site if it is necessary for NGC 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)

The information listed below, both current and forecast, and where not already supplied under this Schedule 5, may be requested by NGC 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 NGC 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 OUTAGE INFORMATION

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>TIMESCALE COVERED</th>
<th>UPDATE TIME</th>
<th>DATA CAT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Details are required from <strong>Network Operators</strong> of proposed outages in their <strong>User Systems</strong> and from <strong>Generators</strong> with respect to their outages, which may affect the performance of the <strong>Total System</strong> (eg. at a <strong>Connection Point</strong> or constraining <strong>Embedded Large Power Stations</strong>)</td>
<td>Years 3-5</td>
<td>Week 8 (PES etc)</td>
<td>Week 13 (Generators)</td>
<td>OC2</td>
</tr>
<tr>
<td>(NGC advises <strong>Network Operators</strong> of <strong>NGC GB Transmission System</strong> outages)</td>
<td>Years 3-5</td>
<td>Week 28</td>
<td></td>
<td>OC2</td>
</tr>
<tr>
<td>(affecting their <strong>Systems</strong>)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Network Operator</strong> informs NGC if unhappy with proposed outages)</td>
<td>&quot;</td>
<td>Week 30</td>
<td></td>
<td>OC2</td>
</tr>
<tr>
<td>(NGC draws up draft <strong>NGC GB Transmission System</strong> (outage plan advises <strong>Users</strong> of operational effects)</td>
<td>&quot;</td>
<td>Week 34</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Generators</strong> and <strong>Non-Embedded Customers</strong> provide Details of <strong>Apparatus</strong> owned by them (other than Gensets) at each <strong>Grid Supply Point</strong></td>
<td>Years 1-2</td>
<td>Week 13</td>
<td></td>
<td>OC2</td>
</tr>
<tr>
<td>(NGC advises <strong>Network Operators</strong> of outages affecting their <strong>Systems</strong>)</td>
<td>Year 1-2</td>
<td>Week 28</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Network Operator</strong> details of relevant outages affecting the <strong>Total System</strong></td>
<td>Years 1-2</td>
<td>Week 32</td>
<td></td>
<td>OC2</td>
</tr>
<tr>
<td>(NGC informs <strong>Users</strong> of generation restrictions or other impact on their <strong>Systems</strong>)</td>
<td>Years 1-2</td>
<td>Week 34</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Users</strong> inform NGC if unhappy with restrictions or other impacts as notified</td>
<td>Years 1-2</td>
<td>Week 36</td>
<td></td>
<td>OC2</td>
</tr>
<tr>
<td>(NGC issues final <strong>NGC GB Transmission System</strong> (outage plan with advice of operational effects on <strong>Users System</strong>))</td>
<td>Years 1-2</td>
<td>Week 49</td>
<td></td>
<td>OC2</td>
</tr>
<tr>
<td>(Generator, <strong>Network Operator</strong> and <strong>Non-Embedded Customers</strong> to inform NGC of changes to outages previously requested)</td>
<td>Week 8 ahead to year end</td>
<td>As occurring</td>
<td></td>
<td>OC2</td>
</tr>
<tr>
<td>Details of load transfer capability of 12MW or more between <strong>Grid Supply Points in England and Wales</strong> and 10MW or more between <strong>Grid Supply Points in Scotland</strong>,</td>
<td>Within Yr 0</td>
<td>As NGC request</td>
<td></td>
<td>OC2</td>
</tr>
</tbody>
</table>

Note: **Users** should refer to **OC2** for full details of the procedure summarised above and for the information which **NGC** 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 **NGC**.

<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>DATA FOR FUTURE YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOR ALL TYPES OF DEMAND FOR EACH GRID SUPPLY POINT</td>
<td></td>
<td>Yr 1</td>
</tr>
<tr>
<td>The following information is required infrequently and should only be supplied, wherever possible, when requested by <strong>NGC</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:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensitivity of demand to fluctuations in voltage And frequency on <strong>NGC GB Transmission System</strong> at time of peak <strong>Connection Point Demand (Active Power)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage Sensitivity</td>
<td>MW/kV</td>
<td></td>
</tr>
<tr>
<td>Mvar/kV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency Sensitivity</td>
<td>MW/Hz</td>
<td></td>
</tr>
<tr>
<td>Mvar/Hz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reactive Power sensitivity should relate to the <strong>Power Factor</strong> information given in Schedule 11 (or for Generators, Schedule 1) and note 6 on Schedule 11 relating to <strong>Reactive Power</strong> therefore applies:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase unbalance imposed on <strong>NGC the GB Transmission System</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>NGC GB Transmission System</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>%</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></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>
DATA SUPPLIED BY NGC 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 NGCGB Transmission System Demand</td>
</tr>
<tr>
<td></td>
<td>Day of the minimum NGCGB 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>

DATA TO BE SUPPLIED BY NGC TO USERS

PURSUANT TO THE TRANSMISSION LICENCE

1. The Transmission Licence requires NGC 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 NGCGB 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 NGC 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 NGC to offer terms for an agreement for connection to and use of the NGCGB Transmission System and further information will be given by NGC to the potential User in the course of the discussions of the terms of such an agreement.
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>
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<tr>
<td>Demand Profiles</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Time</th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>
DATA DESCRIPTION

<table>
<thead>
<tr>
<th>Out-turn Actual Weath corr.</th>
<th>F.Yr. 0 Update Time</th>
<th>Data Cat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Energy Data</td>
<td>Week 24</td>
<td>SPD</td>
</tr>
</tbody>
</table>

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 ‘NGC’ means ‘Financial Year’

2. **Demand** and **Active Energy** Data (General)

   **Demand** and **Active Energy** data should relate to the point of connection to the NGCGB 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 NGCGB Transmission System.

4. In addition the demand profile is to be supplied for such days as NGC 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).

<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</th>
<th>DATA CAT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SPECIFIC HALF HOUR DEMANDS AND POWER FACTORS</strong> (see Notes 2, 3 and 5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individual Connection Point Demands and Power Factor at: (name of GSP)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Wk.24</td>
<td>SPD</td>
</tr>
<tr>
<td>The annual peak half hour at the Connection Point at Annual ACS Conditions</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Wk.24</td>
<td>SPD</td>
</tr>
<tr>
<td>Lumped Susceptance (See Note 6. This data item is not required if a Single Line Diagram associated with the Connection Point has been provided)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Wk.24</td>
<td>SPD</td>
</tr>
<tr>
<td>Deduction made for Small Power Stations, Medium Power Stations and Customer Generating Plant (MW)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Wk.24</td>
<td>SPD</td>
</tr>
<tr>
<td>The specified time of the annual peak half hour of NGCGB Transmission System Demand at Annual ACS Conditions</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Wk.24</td>
<td>SPD</td>
</tr>
<tr>
<td>Deduction made for Small Power Stations, Medium Power Stations and Customer Generating Plant (MW)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>Wk.24</td>
<td>SPD</td>
</tr>
<tr>
<td>The specified time of the annual minimum half hour of the NGCGB Transmission System Demand</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Wk.24</td>
<td>SPD</td>
</tr>
<tr>
<td>Deduction made for Small Power Stations, Medium Power Stations and Customer Generating Plant</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Wk.24</td>
<td>SPD</td>
</tr>
<tr>
<td>For such other times as NGC may specify before</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Once</td>
<td>SPD</td>
</tr>
<tr>
<td>Deduction made for Small Power Stations, Medium Power Stations and Customer Generating Plant</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td>-</td>
<td>Once</td>
<td>SPD</td>
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</table>
### DATA DESCRIPTION

<table>
<thead>
<tr>
<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>
</table>

#### DEMAND TRANSFER CAPABILITY (PRIMARY SYSTEM)

Where a **User's Demand**, or group of **Demands**, may be fed from alternative **Connection Point(s)** the following information should be provided:

**First circuit outage (fault outage) condition**

- **Name of the alternative Connection Point(s)**
- **Demand transferred** (MW) (Mvar)
- **Transfer arrangement** i.e Manual (M) Interconnection (I) Automatic (A)
- **Time to effect transfer** (hrs)

**Second Circuit outage (planned outage) condition**

- **Name of the alternative Connection Point(s)**
- **Demand transferred** (MW) (Mvar)
- **Transfer arrangement** i.e Manual (M) Interconnection (I) Automatic (A)
- **Time to effect transfer** (hrs)

The above demand transfer capability information for specific **Grid Supply Points** is to be updated during the current year - see Schedule 6.
DATA DESCRIPTION | F.Yr 0 | F.Yr 1 | F.Yr 2 | F.Yr 3 | F.Yr 4 | F.Yr 5 | F.Yr 6 | F.Yr 7 | UPDATE TIME | DATA CAT |
---|---|---|---|---|---|---|---|---|---|---|
**SMALL POWER STATION, MEDIUM POWER STATION AND CUSTOMER GENERATION SUMMARY**

For each **Connection Point** where there are **Embedded** Small Power Stations, Medium Power Stations or Customer Generating Stations the following information is required:

- **No. of Small Power Stations, Medium Power Stations or Customer Power Stations**
  - Wk.24 | SPD
- **Number of Generating Units within these stations**
  - Wk.24 | SPD
- **Summated Capacity of all these Generating Units**
  - Wk.24 | SPD
- Where the **Network Operator’s System** places a constraint on the capacity of an **Embedded Large Power Station**

<table>
<thead>
<tr>
<th>Station Name</th>
<th>Generating Unit</th>
<th>System Constrained Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Wk.24</td>
</tr>
</tbody>
</table>

For each **Single Line Diagram** provided under Schedule 5, nodal **Demands, Power Factors** and lumped susceptances are to be provided for the specified time of the annual peak half hour of **NGC GB Transmission System** Demand at Annual ACS Conditions:

<table>
<thead>
<tr>
<th>Connection Point</th>
<th>Year</th>
<th>Wk.24</th>
<th>SPD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node</td>
<td>Demand</td>
<td>Power Factor</td>
<td>Lumped Susceptance</td>
</tr>
</tbody>
</table>

**NOTES:**

1. ‘F.Yr.’ means **NGC Financial Year**. F.Yr. 1 refers to the current financial year.

2. **Demand Data (General)**

   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. Demand** met by **Suppliers** supplying **Customers** within the **User System** should be included. Auxiliary demand of **Embedded 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 Demands 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 NGC GB Transmission System. Where the busbars on a Connection Point are expected to be run in separate sections separate Demand data should be supplied for each such section of busbar.

In deriving Demands 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. NGC 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.

6. Power Factor data should allow for series reactive losses on the User's System but exclude reactive compensation specified separately in Schedule 5, and any network susceptance provided under Schedule 11.
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**.

### DATA DESCRIPTION

<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>
<tr>
<td>Demand met or to be relieved by Demand Control (averaging 42MW at the Demand Control Notification Level or more over a half hour) at each Connection Point.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Demand Control</strong> at time of <strong>NGC GB Transmission System</strong> weekly peak demand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demand Control</td>
<td>MW</td>
<td>F yrs 0 to 5</td>
</tr>
<tr>
<td>duration</td>
<td>Min</td>
<td>)</td>
</tr>
<tr>
<td>For each half hour</td>
<td>MW</td>
<td>Wks 2-8 ahead</td>
</tr>
<tr>
<td>For each half hour</td>
<td>MW</td>
<td>Days 2-12 ahead</td>
</tr>
<tr>
<td>For each half hour</td>
<td>MW</td>
<td>Previous calendar day</td>
</tr>
<tr>
<td><strong>Customer Demand Management</strong> (of 12MW at the Customer Demand Management Notification Level or more at the Connection Point)</td>
<td></td>
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</tr>
<tr>
<td>For each half hour</td>
<td>MW</td>
<td>Any time in Control Phase</td>
</tr>
<tr>
<td>For each half hour</td>
<td>MW</td>
<td>Remainder of period</td>
</tr>
<tr>
<td>For each half hour</td>
<td>MW</td>
<td>Previous calendar day</td>
</tr>
<tr>
<td><strong>In Scotland, Load Management Blocks</strong></td>
<td>MW</td>
<td>For the next day</td>
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</table>

**In Scotland, Load Management Blocks**
For each block of 5MW or more, for each half hour
<table>
<thead>
<tr>
<th>DATA DESCRIPTION</th>
<th>UNITS</th>
<th>TIME COVERED</th>
<th>UPDATE TIME</th>
<th>DATA CAT.</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Demand Control</em> or Pump Tripping Offered as Reserve</td>
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<td></td>
<td></td>
</tr>
<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>
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</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>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 (requested under Schedule 11 - repeated here for reference)</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 NGC</td>
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<td>OC6</td>
</tr>
<tr>
<td>5 mins</td>
<td>%</td>
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<td>“”</td>
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</tr>
<tr>
<td>10 mins</td>
<td>%</td>
<td>“”</td>
<td>“”</td>
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</tr>
<tr>
<td>15 mins</td>
<td>%</td>
<td>“”</td>
<td>“”</td>
<td></td>
</tr>
<tr>
<td>20 mins</td>
<td>%</td>
<td>“”</td>
<td>“”</td>
<td></td>
</tr>
<tr>
<td>25 mins</td>
<td>%</td>
<td>“”</td>
<td>“”</td>
<td></td>
</tr>
<tr>
<td>30 mins</td>
<td>%</td>
<td>“”</td>
<td>“”</td>
<td></td>
</tr>
<tr>
<td>Automatic Low Frequency Disconnection</td>
<td>MW</td>
<td>Year ahead from week 24</td>
<td>Annual in week 24</td>
<td>OC6</td>
</tr>
<tr>
<td>Magnitude of Demand disconnected, and frequency at which Disconnection is initiated, for each frequency setting for each Grid Supply Point</td>
<td>Hz</td>
<td>“”</td>
<td>“”</td>
<td></td>
</tr>
</tbody>
</table>

Notes

1. **Network Operators** may delay the submission until calendar week 28.
### DATA REGISTRATION CODE

#### SCHEDULE 13

**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 **NGC GB 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>
</tr>
</thead>
<tbody>
<tr>
<td>SHORT CIRCUIT INFEED TO THE GB TRANSMISSION SYSTEM FROM USERS SYSTEM AT A CONNECTION POINT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Name of node or <strong>Connection Point</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Symmetrical three phase short-circuit current infeed</td>
<td></td>
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<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>
</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>
</tr>
<tr>
<td>Zero sequence source impedances as seen from the <strong>Point of Connection</strong> or node on the <strong>Single Line Diagram</strong> (as appropriate) 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>
</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>
</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>
</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>
</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>
</tr>
<tr>
<td>Negative sequence impedances of <strong>User’s System</strong> as seen from the <strong>Point of Connection</strong> or node on the <strong>Single Line Diagram</strong> (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>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Resistance</td>
<td>% on 100</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<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>
</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 (eg **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>
</tr>
</thead>
<tbody>
<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>
</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>
</tr>
<tr>
<td>Symmetrical three phase short-circuit current infeed through the <strong>Unit Transformer(s)</strong> for a fault at the <strong>Generating Unit</strong> terminals</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>
</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>
</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>
</tr>
<tr>
<td>Subtransient time constant (if significantly different from 40ms)</td>
<td>ms</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>
</tr>
<tr>
<td>The following data items need only be supplied if the <strong>Generating Unit</strong> Step-up Transformer can supply zero sequence current from the <strong>Generating Unit</strong> side to the <strong>NGCDB Transmission System</strong></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 <strong>Generating Unit</strong> 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>
</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>
</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>
</tr>
</tbody>
</table>
Fault infeeds via **Station Transformers**

A submission is required for each **Station Transformer** directly connected to the **NGC system GB 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>
</tr>
</thead>
<tbody>
<tr>
<td>Name of <strong>Power Station</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of <strong>Station Transformer</strong></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 for a fault at the <strong>Connection Point</strong></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>
</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>
</tr>
<tr>
<td>Positive sequence X/R ratio</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At instance of fault</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)</td>
<td>mS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></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></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 <strong>Point of Connection</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>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>
</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>
</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>
</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
MOTHBALED GENERATING UNIT INFORMATION

The following data items must be supplied with respect to each Mothballed Generating Unit

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>MW output that can be returned to service</td>
<td>MW</td>
<td>DPD</td>
<td>&lt;1 month</td>
</tr>
</tbody>
</table>

Notes
1. The time periods identified in the above table represent the estimated time it would take to return the Mothballed Generating Unit to service once a decision to return has been made.
2. Where a Mothballed Generating Unit 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 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 (*please specify)</td>
<td>Text</td>
<td>DPD</td>
<td>Oil distillate</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</td>
<td>MWh(electrical) /day</td>
<td>DPD</td>
<td></td>
</tr>
<tr>
<td>of alternative fuels on the basis of <strong>Good Industry Practice</strong></td>
<td></td>
<td></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 <strong>NGC Financial Year</strong></td>
<td>Text</td>
<td>DPD</td>
<td>0 / 1-5 / 6-10 / 11-20 / &gt;20 **</td>
</tr>
<tr>
<td>DATA DESCRIPTION</td>
<td>UNITS</td>
<td>1</td>
<td>2</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></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></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></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.
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, NGC).

GC.3 UNFORESEEN CIRCUMSTANCES

GC.3.1 If circumstances arise which the provisions of the Grid Code have not foreseen, NGC 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 NGC and those Users as to what should be done cannot be reached in the time available, NGC shall determine what is to be done. Wherever NGC 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 NGC 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. NGC 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 NGC 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.6.2, PC Appendix C, CC.6.1, CC.6.2, CC.6.3, OC8 and GC.11) may wish to submit to NGC for consideration by the Panel from time to time;

(c) publish recommendations as to amendments to the Grid Code that NGC 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; and
(e) consider what changes are necessary to the Grid Code arising out of any unforeseen circumstances referred to it by NGC under GC.3.3; 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.3.3 The Panel shall consist of:

(a) a Chairman and up to 4 members appointed by NGC;
(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 53 GW;
(ii) a person representing those Generators each having Large Power Stations with a total Registered Capacity of 53 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; and
(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 NGC 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 NGC shall establish (and, where appropriate, revise from time to time) joint working arrangements with the STC Committee to facilitate the identification, co-ordination, 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 NGC AND USERS**

**GC.5.1** Unless otherwise specified in the Grid Code, all instructions given by NGC and communications (other than relating to the submission of data and notices) between NGC and Users (other than Generators or Suppliers) shall take place between the NGC Control Engineer based at the NGC Transmission Control Centre notified by NGC 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 NGC prior to connection.

**GC.5.2** Unless otherwise specified in the Grid Code all instructions given by NGC and communications (other than relating to the submission of data and notices) between NGC and Generators and/or Suppliers shall take place between the NGC Control Engineer based at the NGC Transmission Control Centre notified by NGC to each Generator prior to connection, or to each Supplier prior to submission of BM Unit Data, and either the relevant Generator's or Supplier's Trading Point (if it has established one) notified to NGC or the Control Point of the Supplier or the Generator's Power 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 are situated.

**GC.5.3** Unless otherwise specified in the Grid Code, all instructions given by NGC and communications (other than relating to the submission of data and notices) between NGC and Users will be given by means of the Control Telephony referred to in CC.6.5.2.

**GC.5.4** If the NGC Transmission Control Centre notified by NGC to each User prior to connection, or the User Control Centre, notified in the case of a Network Operator to NGC prior to connection, is moved to another location, whether due to an emergency or for any other reason, NGC shall notify the relevant User or the User shall notify NGC, as the case may be, of the new location and any changes to the Control Telephony necessitated by such move, as soon as practicable following the move.

**GC.5.5** If any Trading Point notified to NGC by a Generator 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 or Supplier shall immediately notify NGC.
GC.5.6 The recording (by whatever means) of instructions or communications given by means of Control Telephony will be accepted by NGC 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 NGC 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 NGC 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 NGC, shall be addressed to the National Grid Transmission Control Centre at the address notified by NGC to each User prior to connection, or to such other Department within NGC or address, as NGC 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 NGC from time to time) at its address(es) notified by each User to NGC 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 NGC, then for the purposes of communication and co-ordination in operational timescales NGC can (for those purposes only) treat that User's System (or part thereof) as part of the NGC GB Transmission System, but, as between NGC 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 NGC and Users to agree and there is a failure so to agree the matter shall not without the consent of both NGC 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 NGC or a User, or in respect of (a) or (b) to the annex, NGC, 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 NGC 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, NGC 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, NGC will establish a Panel working group if this was thought appropriate and in any event NGC shall undertake a consultation of Authorised Electricity Operators liable to be materially affected by the proposal.

(f) Following such consultation, NGC will report back to Panel members, either in writing or at a Panel meeting. If there was broad consensus in the consultation, then NGC will make the change to the Electrical Standard or the list of Electrical Standards contained in the Annex to this GC.

(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 NGC of its decision. If the decision is to so implement the change, NGC will make the change to the Electrical Standard or the list of Electrical Standards contained in the Annex to this GC.

(h) In all cases where a change is made to the list of Electrical Standards, NGC 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, NGC will contact all Panel members after it is so implemented to check whether they wish to discuss further the implemented proposal to see whether an additional proposal should be considered to alter the implementation, such proposal following the ordinary Electrical Standards procedure.

GC.12 CONFIDENTIALITY

GC.12.1 Users should note that although the Grid Code contains in certain sections specific provisions which relate to confidentiality, the confidentiality provisions set out in the CUSC apply generally to information and other data supplied as a requirement of or otherwise under the Grid Code.

GC.13 RELEVANT TRANSMISSION LICENSEEES

GC.13.1 It is recognised that the Relevant Transmission Licensees are not parties to the Grid Code. Accordingly, notwithstanding that Operating Code No. 8
Appendix 2 ("OC8B") refers to obligations which will in practice be performed by the Relevant Transmission Licensees or the Safety Co-ordinator nominated 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 OC8B shall exist between NGC and the relevant User and in relation to any enforcement of those rights and obligations OC8B shall be so read and construed. The Relevant Transmission Licensees shall enjoy no enforceable rights under OC8B nor shall they be liable (other than pursuant to the STC) for failing to discharge any obligations under OC8B.

GC.13.2 For the avoidance of doubt nothing in this Grid Code confers on any Relevant Transmission Licensee any rights, powers or benefits for the purpose of the Contracts (Rights of Third Parties) Act 1999.
Annex to the General Conditions

The Electrical Standards are as follows:-

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(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.

(d) Scottish Electrical Standards for SHETL’s Transmission System.

< End of GC >
NGC’s Transmission Licence sets out the way in which changes to the Grid Code are to be made and reference is also made to NGC’s obligations under the General Conditions. In order to ensure that Users have access to a current version of the Grid Code, Users who have purchased a serviced copy of the Grid Code receive a set of replacement pages containing the revisions made to the Grid Code pursuant to the Transmission Licence. Unserviced copies are not so updated but each unserviced copy issued is accompanied by all revisions since the date the unserviced version of the Grid Code was last reprinted.

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]. In [ ] the British Electricity Trading and Transmission Arrangements (BETTA) were introduced and Issue 3 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 3 of the Grid Code.

All inquiries in relation to revisions to the Grid Code, including revisions to Issues 1 and 2, should be addressed to the Grid Code development team at the address given at the front of the Grid Code.
CONSTITUTION AND RULES

OF THE

GRID CODE REVIEW PANEL

(revised – 4th December 2001 BETTA Go-Active Date)
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1. **Name**

The panel shall be called the Grid Code Review Panel.

2. **Definitions and Interpretation**

2.1 The following words and expressions shall have the following meanings in this Constitution:-

"Chairman" means the person appointed by NGC under Clause 5.1(a) or the person appointed by NGC from time to time under Clause 8.1, all references herein to "the Chairman" shall, where the context so admits, include any person appointed to perform the duties of the Chairman in the absence of the Chairman.

"Constitution" means the constitution and rules of the Panel as set out herein and as may be amended from time to time with the approval of the Authority.

"Grid Code" means the grid code drawn up pursuant to Standard Condition \[C14\] of the NGC's Transmission Licence, as from time to time revised in accordance with paragraphs 2, 3 and 4 of Condition \[C14\] of the NGC's Transmission Licence.

"Member" means a person duly appointed pursuant to Clause 5 to be a member of or the Chairman of the Panel.

"Panel" means the Grid Code Review Panel.

"Secretary" means the person appointed by NGC pursuant to Clause 9.1, and named as such.

2.2 Except as otherwise provided herein and unless the context otherwise admits, words and expressions used herein shall have the same meaning as defined in the Grid Code.

2.3 Words importing the singular only also include the plural and vice versa where the context requires. Words importing the masculine only also include the feminine.

2.4 Headings and titles shall not be taken into consideration in the interpretation or construction of the words and expressions used herein.
3. **Constitution**

The Panel is a standing body established and maintained by NGC pursuant to GC.4.1 of the Grid Code.

4. **Objects**

4.1 The objects of the Panel shall be the following objects, and such further objects as may be attributed to the Panel by the Grid Code from time to time:-

4.1.1 to keep the Grid Code and its working under review;

4.1.2 to review all suggestions for amendments to the Grid Code which any Member is requested by the Authority or a User (or any Relevant Transmission Licensee in respect of PC.6.2, PC Appendix C, CC.6.1, CC.6.2, CC.6.3, OC8 and GC.11), to submit to the Secretary for consideration by the Panel from time to time;

4.1.3 to publish recommendations as to amendments to the Grid Code that NGC or the Panel feels are necessary or desirable and the reasons for the recommendations;

4.1.4 to issue guidance in relation to the Grid Code and its implementation, performance and interpretation when asked to do so by any Member on behalf of a User; and

4.1.5 to consider what changes are necessary to the Grid Code arising out of any unforeseen circumstances referred to it by NGC under GC.3 of the Grid Code; and

4.1.6 to 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.

5. **Membership**

5.1 The Panel shall consist of:-

(a) a Chairman and up to 4 members appointed by NGC;

(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 53GW;

(ii) a person representing those Generators each having Large Power Stations with a total Registered Capacity of 53GW or less;
(iii) 32 persons representing the Network Operators in England and Wales;

(iv) a person representing the Network Operators in Scotland;

(v) a person representing Suppliers;

(vi) a person representing 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; and

(ix) a person representing the Externally Interconnected System Operators;

(x) a person representing Generators with Novel Units; and


5.2 If at any time there shall be no Generators with Small Power Stations and/or Medium Power Stations (other than Generators which also have Large Power Stations), the Authority shall be notified by the Chairman and shall have the right, until the next following meeting of the Panel after there shall be one or more Generator with Small Power Stations and/or Medium Power Stations, at any time and from time to time, to appoint a person to be a Member and to remove any person so appointed by it.

5.3 If (other than on re-appointment of a Member or Members appointed by any person or group of persons entitled to so appoint, which is dealt with in paragraph 5.5 below) at any time any person or group of persons entitled to appoint a Member or Members shall not have made an appointment(s) and/or shall be in disagreement as to who to appoint, the Chairman shall request the Authority to make such appointment and the Authority shall have the right, until the relevant person or group of persons has decided upon an appointment and notified the Authority accordingly, to appoint a Member or Members on behalf of that person or group of persons, and to remove any person so appointed by it.

5.4 No person other than an individual shall be appointed a Member or his alternate.

5.5 (a) Each Member shall retire automatically at the beginning of the meeting of the Panel held on the first Business Day in the month of February each year (or if no meeting is held on such day, at the meeting which is held on the date falling closest after that day) but shall be eligible for re-appointment.

(b) Each person or group of persons entitled to appoint a Member (or a person within such group of persons) may, by notice in writing to the Chairman, indicate its wish to re-appoint the retiring Member or to appoint a new person as a Member in his place.
(c) Such notifications for re-appointment or appointment must be delivered to the Chairman at least 21 days in advance of that meeting of the Panel from the person or group of persons (or a person within such group of persons) represented by each Member. A notification for re-appointment in respect of an existing Member shall be deemed to be given if no notification is delivered to the Chairman at least 21 days in advance of that meeting of the Panel.

(d) If only one notification is received for the re-appointment of a Member or appointment of a new person as a Member (or if all notifications received are unanimous), the person named in the notifications(s) will become the Member with effect from the beginning of that meeting of the Panel.

(e) If more than one notification is received in respect of a Member or a person to become a Member (not being unanimous), the Chairman will within 7 days of receipt of the last of such notifications contact (insofar as he is reasonably able) the group of persons represented by that Member and seek to encourage unanimous agreement between those persons as to the prospective Member. If agreement is reached, then the new person will replace the existing Member, or the existing Member will continue if that is the result of the agreement, with effect from the beginning of that meeting of the Panel.

(f) If agreement is not reached, the Chairman shall notify the Authority and the Authority shall determine who shall be appointed and notify the Chairman and the relevant persons accordingly. That new person will replace the existing Member, or the existing Member will continue if that is the result of the determination, with effect from the beginning of that meeting of the Panel and shall be deemed to be appointed by the relevant group of persons.

(g) These provisions shall apply equally to persons or groups of persons entitled to appoint more than one Member, with any necessary changes to reflect that more than one Member is involved.

6. **Alternates**

6.1 Each Member shall have the power to appoint any individual to be his alternate and may at his discretion remove an alternate Member so appointed. Any appointment or removal of an alternate Member shall be effected by notice in writing executed by the appointor and delivered to the Secretary or tendered at a meeting of the Panel. If his appointor so requests, an alternate Member shall be entitled to receive notice of all meetings of the Panel or of sub-committees or working groups of which his appointor is a member. He shall also be entitled to attend and vote as a Member at any such meeting at which the Member appointing him is not personally present and at the meeting to exercise and discharge all the functions, powers and duties of his appointor as a Member and for the purpose of the proceedings at the meeting the provisions of this Constitution shall apply as if he were a Member.

6.2 Every person acting as an alternate Member shall have one vote for each Member for whom he acts as alternate, in addition to his own vote if he is also a Member. Execution by an alternate Member of any resolution in writing of the Panel shall, unless the notice of his appointment provides to the contrary, be as effective as execution by his appointor.
6.3 An alternate Member shall ipso facto cease to be an alternate Member if his appointor ceases for any reason to be a Member.

6.4 References in this Constitution to a Member shall, unless the context otherwise requires, include his duly appointed alternate.

7. **Representation and Voting**

7.1 The Chairman and each other Member shall be entitled to attend and be heard at every meeting of the Panel. One adviser (or such greater number as the Chairman shall permit) shall be entitled to attend any meeting of the Panel with each Member and shall be entitled to speak at any meeting but shall not be entitled to vote on any issue.

7.2 Each Member (including the Chairman) shall be entitled to cast one vote. In the event of an equality of votes, the Chairman shall have a second or casting vote.

7.3 Any person or persons entitled to appoint a Member or the Chairman, as the case may be, pursuant to Clause 5 may at any time remove that Member or the Chairman, as the case may be, from office and appoint another person to be a Member or the Chairman, as the case may be, in its place. A person or persons will only have the right to remove from office the Member or the Chairman, as the case may be, that it or they have appointed, and will have no right to remove from office any Member or the Chairman, as the case may be, appointed by another person. Whenever any individual Member or the Chairman changes, the person or group of persons entitled to appoint that Member or the Chairman shall notify the Secretary in writing within seven days of the change taking effect.

8. **The Chairman**

8.1 Upon retirement or removal by NGC of the first and each successive Chairman, NGC shall appoint a person to act as Chairman.

8.2 NGC may at any time remove the Chairman from office.

8.3 The Chairman shall preside at every meeting of the Panel at which he is present. If the Chairman is unable to be present at a meeting, he may appoint an alternate pursuant to Clause 6.1 to act as Chairman. If neither the Chairman nor any other person appointed to act as Chairman is present within half an hour after the time appointed for holding the meeting, the Members present appointed by NGC, may appoint one of their number to be Chairman of the meeting.
8.4 The Chairman, or the person appointed to act as Chairman by the Chairman shall be entitled to cast one vote. Where a Member is acting in the capacity of both Member and Chairman, he shall be entitled to cast one vote as Chairman, in addition to his one vote as Member.

9. **The Secretary**

9.1 NGC shall have power to appoint and dismiss a Secretary and such other staff for the Panel as it may deem necessary. The Secretary may, but need not be, a Member, but shall not be a Member by virtue only of being Secretary. The Secretary shall have the right to speak at, but, unless a Member, no right to cast a vote at any meeting.

9.2 The Secretary's duties shall be to attend to the day to day operation of the Panel and, in particular, to:-

(i) attend to the requisition of meetings and to serve all requisite notices;

(ii) maintain a register of names and addresses of Members and the Chairman and alternates as appointed from time to time;

(iii) maintain a register of names and addresses of persons in each of the groups of persons described in sub-clauses 5.1(c)(i), (ii), (iii) and (vi) and of those persons in the group described in sub-clause 5.1(c)(iv) which are parties to the CUSC Framework Agreement; and

(iv) keep minutes of all meetings.

9.3 The Secretary shall make available the registers of names and addresses referred to in sub-clauses 9.2(ii) and (iii) above, for inspection by any Authorised Electricity Operator and/or the Authority between 1000 hours and 1600 hours each Business Day. The Secretary shall provide any Authorised Electricity Operator and/or the Authority with a copy of the said registers within a reasonable period of being requested to do so.

10. **Meetings**

10.1 The Panel shall hold meetings on the first Business Day in the months of May, August, November and February or at such other regular scheduled times as it may decide. The normal venue for meetings shall be National Grid House, Coventry.

10.2 The Chairman or any other Member may request the Secretary to requisition further meetings by giving 21 days notice to the Secretary. The notice shall be in writing and contain a summary of the business that it is proposed will be conducted. The Secretary shall proceed to convene a meeting of the Panel within 7 days of the date of expiry of such notice in accordance with the provisions of Clause 11.

11. **Notice of Meetings**

11.1 All meetings shall be called by the Secretary on at least 14 days written notice (exclusive of the day on which it is served and of the day for which it is given), or by shorter notice if
so agreed in writing by all Members. If at any time a person has not been appointed as Secretary, or the Secretary is for any reason unable to act, the Chairman shall attend to the requisition of meetings.

11.2 The notice of each meeting shall contain the time, date and venue of the meeting, an agenda and a summary of the business to be conducted and shall be given to all Members.

11.3 The accidental omission to give notice of a meeting to, or the non-receipt of notice of a meeting by a person entitled to receive notice shall not invalidate the proceedings at that meeting.

11.4 By notice to the Secretary, any Member can request additional matters to be considered at the meeting and provided such notice is given at least 10 days (exclusive of the day on which it is served and of the day for which it is given) before the date of the meeting, those matters will be included in a revised agenda for the meeting. The Secretary shall circulate the revised agenda to each Member as soon as practicable.

12. **Proceedings at Meetings**

12.1 Subject to Clauses 10 and 11, the Panel may meet for the transaction of business, and adjourn and otherwise regulate its meetings, as it thinks fit.

12.2 Seven Members present in person or by their alternates or in accordance with Clause 13.3, shall constitute a quorum.

12.3 If, within half an hour from the time appointed for holding any meeting of the Panel, a quorum is not present, the meeting shall be adjourned to the same day in the next week at the same time and place and if at the adjourned meeting a quorum is not present within half an hour from the time appointed for holding the meeting, the meeting shall be dissolved.

12.4 Only matters identified in the agenda referred to in Clause 11.2 (or a revised agenda submitted pursuant to Sub-clause 11.4) shall be resolved upon at a meeting.

12.5 All acts done by any meeting of the Panel or of a sub-committee or working group shall, notwithstanding that it be afterwards discovered that there was some defect in the appointment of a Member, be as valid as if such person had been duly appointed.

12.6 A resolution put to the vote of a meeting shall be decided by a show of hands.

13. **Resolutions**

13.1 A resolution of the Panel shall be passed by a simple majority of votes cast.

13.2 A resolution in writing signed by all Members shall be as valid and effective as if it had been passed at a meeting of the Panel duly convened and held and may consist of several documents in like form each signed by or on behalf of one or more Members.

13.3 A meeting of the Panel may consist of a conference between Members who are not all in one place but who are able (directly or by telephonic communication) to speak to each of
the others and to be heard by each of the others simultaneously. The word "meeting" shall be construed accordingly.

14. **Minutes**

14.1 The Secretary shall circulate copies of the minutes of each meeting of the Panel to each Member as soon as practicable (and in any event within ten Business Days) after the relevant meeting has been held.

14.2 Each Member shall notify the Secretary of his approval or disapproval of the minutes of each meeting within 15 Business Days of receipt of the minutes. A Member who fails to do so will be deemed to have approved the minutes. The approval or disapproval of the minutes aforesaid will not affect the validity of decisions taken by the Panel at the meeting to which the minutes relate.

14.3 If the Secretary receives any comments on the minutes, he shall circulate revised minutes as soon as practicable following the expiry of the period referred to in Clause 14.2, incorporating those comments which are of a typographical nature and indicating, where necessary, that Members disagree with certain aspects of the minutes. The Secretary shall then incorporate those aspects of the minutes upon which there is disagreement, into the agenda for the next following meeting of the Panel, as the first item for resolution.

15. **Guidance from the Panel**

15.1 The Panel may at any time, and from time to time, issue guidance in relation to the Grid Code and its implementation, performance and interpretation, and it may establish sub-committees and working groups to carry out such work.

16. **Sub-Committees and Working Groups**

16.1 The Panel may establish such sub-committees from time to time consisting of such persons as it considers desirable. Each sub-committee shall be subject to such written terms of reference and shall be subject to such procedures as the Panel may determine. The meetings of sub-committees shall so far as possible be arranged so that the minutes of such meetings can be presented to the members in sufficient time for consideration before the next following meeting of the Panel.

16.2 The Panel may further establish working groups to advise it on any matter from time to time. Such working groups may consist of Members and/or others as the Panel may determine for the purpose.

16.3 Resolutions of sub-committees and working groups shall not have binding effect unless approved by resolution of the Panel.
17. **Vacation of Office**

The office of a Member shall be vacated if:-

17.1 he resigns his office by notice delivered to the Secretary; or

17.2 he becomes bankrupt or compounds with his creditors generally; or

17.3 he becomes of unsound mind or a patient for any purpose of any statute relating to mental health; or

17.4 he or his alternate fails to attend more than three consecutive meetings of the Panel without submitting an explanation to the Chairman which is reasonably acceptable to the Chairman.

18. **Members' Responsibilities and Protections**

18.1 In the exercise of its powers and the performance of its duties and responsibilities, the Panel shall have due regard for the need to promote the attainment of the principal objects of the Panel set out in Clause 4.

18.2 In the exercise of its powers and the performance of its duties and responsibilities as a Member, a Member shall represent the interests of that person or persons by whom he is for the time being appointed pursuant to Clause 5, provided that such obligation of representation shall at all times be subordinate to the obligations of the Member as a member of the Panel set out in Clause 18.1.

18.3 Protections:

18.3.1 The Panel, each Member and the Secretary shall be entitled to rely upon any communication or document reasonably believed by it or him to be genuine and correct and to have been communicated or signed by the person by whom it purports to be communicated or signed.

18.3.2 The Panel, each Member and the Secretary may in relation to any act, matter or thing contemplated by this Constitution act on the opinion or advice of, or any information from, any chartered engineer, lawyer, or expert in any other field, and shall not be liable for the consequences of so acting.

19. **Group Representatives' addresses**

Each Member shall from time to time communicate his address to the Secretary and all notices sent to such address shall be considered as having been duly given.